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Aims and Scope

Turkish Journal of Colorectal Disease is an official journal of the Turkish Society of Colon and Rectal Surgery to provide epidemiologic, pathologic, diagnostic and therapeutic studies relevant to the management of small intestine, colon, rectum, anus and pelvic floor diseases. It was launched in 1991. Although there were temporary interruptions in the publication of the journal due to various challenges, the Turkish Journal of Colorectal Disease has been published continually from 2007 to the present. It is published quarterly (March, June, September and December) as hardcopy and an electronic journal at http://www.turkishjcrd.com/

The target audience of Turkish Journal of Colorectal Disease includes surgeons, pathologists, oncologists, gastroenterologists and health professionals caring for patients with a disease of the colon and rectum.

The Turkish name of the journal was formerly Kolon ve Rektum Hastalıkları Dergisi and the English name of the journal was formerly Journal of Diseases of the Colon and Rectum.

Turkish Journal of Colorectal Disease is indexed in **TÜBİTAK/ULAKBİM, Directory of Open Access Journals (DOAJ), CINAHL Ultimate, British Library, Root Indexing, Academic Keys, Idealonline, Index Copernicus, Gale/Cengage Learning, Turkish Citation Index** and **TurkMedline**.

The aim of Turkish Journal of Colorectal Disease is to publish original research papers of the highest scientific and clinical value at an international level. Furthermore, review articles, case reports, technical notes, letters to the editor, editorial comments, educational contributions and congress/meeting announcements are released.

Turkish Journal of Colorectal Disease is an independent open access peer-reviewed international journal printed in Turkish and English languages. Manuscripts are reviewed in accordance with "double-blind peer review" process for both referees and authors. The Editorial Board of the Turkish Journal of Colorectal Disease endorses the editorial policy statements approved by the WAME Board of Directors. The journal is in compliance with the uniform requirements for manuscripts submitted to biomedical journals published by the International Committee of Medical Journal Editors (NEJM 1997;336:309-315, updated 2001).

Open Access Policy

This journal provides immediate open access to its content on the principle that making research freely available to the public supports a greater global exchange of knowledge. Open Access Policy is based on rules of Budapest Open Access Initiative (BOAI) http://www.budapestopenaccessinitiative.org/.

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Instructions for authors are published in the journal and at www.turkishjcrd.com

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Authors are responsible for the manuscripts they publish in Turkish Journal of Colorectal Disease. The editor, editorial board, and publisher do not accept any responsibility for published manuscripts.

If you use a table or figure (or some data in a table or figure) from another source, cite the source directly in the figure or table legend.

The journal is printed on acid-free paper.

Financial expenses of the journal are covered by Turkish Society of Colon and Rectal Surgery.

Editorial Policy

Following receipt of each manuscript, a checklist is completed by the Editorial Assistant. The Editorial Assistant checks that each manuscript contains all required components and adheres to the author guidelines, after which time it will be forwarded to the Editor in Chief. Following the Editor in Chief's evaluation, each manuscript is forwarded to the Associate Editor, who in turn assigns reviewers. Generally, all manuscripts will be reviewed by at least three reviewers selected by the Associate Editor, based on their relevant expertise. Associate editor could be assigned as a reviewer along with the reviewers. After the reviewing process, all manuscripts are evaluated in the Editorial Board Meeting.

Turkish Journal of Colorectal Disease's editor and Editorial Board members are active researchers. It is possible that they would desire to submit their manuscript to the Turkish Journal of Colorectal Disease. This may be creating a conflict of interest. These manuscripts will not be evaluated by the submitting editor(s). The review process will be managed and decisions made by editor-in-chief who will act independently. In some situation, this process will be overseen by an outside independent expert in reviewing submissions from editors.

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Amaç ve Kapsam

Türk Kolon ve Rektum Hastalıkları Dergisi, Türk Kolon ve Rektum Cerrahi Derneği'nin resmi dergisidir. Bu dernek; ince barsak, kolon, rektum, anüs ve pelvik taban hastalıkları gibi hastalıkların yönetimi ile ilişkili epidemiyoloijk patolojik, tanısal ve tedavi edici çalışmalar yapar. Derneğimiz 1991'de kurulmuştur. Çeşitli zorluklar nedeniyle geçici aksaklıklar olsa da Türk Kolon ve Rektum Hastalıkları Dergisi 2007'den bu yana aralıksız olarak basılmaktadır ve 3 ayda bir olmak üzere (Mart, Haziran, Eylül, Aralık) basılı dergi ve elektronik olarak (http://www.turkishjcrd.com/) yayımlanır.

Derginin hedef kitlesini; cerrahlar, patologlar, onkologlar, gastroenterologlar ve kolorektal hastalarına hizmet veren profesyoneller oluşturur. Derginin amacı; uluslararası düzeyde en yüksek bilimsel ve klinik değeri olan orijinal çalışmaları yayınlamaktır. Bunlara ek olarak derleme (review) makaleleri, olgu sunumları, teknik notlar, editöre mektuplar, editöryal yorumlar, eğitim yazıları ve kongre/toplantı duyuruları yer almaktadır.

Derginin Türkçe eski adı; Kolon ve Rektum Hastalıkları Dergisi ve İngilizce eski adı; Journal of Diseases of the Colon and Rectum'dur.

Kolon ve Rektum Hastalıkları Dergisi, **TÜBİTAK/ULAKBİM, Directory of Open Access Journals (DOAJ), CINAHL Ultimate, British Library, Root Indexing, Academic Keys, Idealonline, Index Copernicus, Gale/Cengage Learning, Türk AtıfDizini** ve **TürkMedline**'de indekslenmektedir.

Türk Kolon ve Rektum Hastalıkları Dergisi, İngilizce ve Türkçe olarak yayımlanan; bağımsız, hakemli, uluslararası bir dergidir. Eserler, hem hakemler hem de otörler tarafından "çift kör hakem denetimi (peer review)" yöntemi ile değerlendirilir. Türk Kolon ve Rektum Hastalıkları Dergisi'nin Editör Kurulu, World Association of Medical Editors (WAME) politikalarına bağlı olarak yürütülmektedir. Bu dergi, Uluslararası Tıp Dergisi Editörler Komitesi (NEJM 1997;336:309-315, updated 2001) tarafından bildirilen, biyomedikal dergilere gönderilen makalelerin uyması gereken standartlara uygunluk göstermektedir.

Açık Erişim Politikası

Bu dergi bilginin yer değiştirmesi ve toplum içinde bilgiye özgürce ulaşma olanağı sağlamak üzere açık erişime imkan vermektedir. Açık Erişim İlkesi "Budapeşte Açık Erişim Girişimi (BOAI)" http://www.budapestopenaccessinitiative.org/ kurallarına dayanmaktadır.

Derginin mali giderleri Türk Kolon ve Rektum Cerrahi Derneği tarafından karşılanmaktadır.

Yazarlar için Kılavuz

Yazarlar için kılavuz hem yayınlanan dergide hem de "http://www.turkishjcrd.com" web sayfasında bulunmaktadır.

Telif Hakkı Devri

Yazarlar Türk Kolon ve Rektum Hastalıkları Dergisi'nde yayınladıkları yazılardan kendileri sorumludurlar. Editör, editör kurulu ve yayıncı hiçbir sorumluluk kabul etmemektedir. Başka bir kaynaktan tablo ya da figür (veya tablo/figürden bir veri) kullandıysanız, direkt olarak tablo ya da figürü kaynak gösteriniz.

Dergi asitsiz kağıda basılmaktadır.

Derginin mali giderleri Türk Kolon ve Rektum Cerrahi Derneği tarafından karşılanmaktadır.

Editöryal Politika

Her yazının alınmasını takiben, bir kontrol listesi Editör Yardımcısı tarafından tamamlanır.

Editör yardımcısı, her yazıyı gerekli öğeleri sağladığı ve yazar kılavuzuna uyumu açısından kontrol eder, ardından editöre iletir. Editör değerlendirmesinin ardından her bir yazı için editör yardımcısı tarafından gözlemciler (reviewers) belirlenir. Genelde, her bir yazıyı ilgili uzmanlıkları göz önüne alınarak atanmış en az 3 gözlemci inceler. Yardımcı editör de diğer gözlemcilerle birlikte gözlemci olarak atanabilir. Gözlemci incelemesinin ardından yazılar editör kurul toplantısında değerlendirilir.

Türk Kolon ve Rektum Hastalıkları Dergisi'nin editör ve editör kurulu üyeleri aktif araştırmacılardır. Kendi araştırmalarının da Türk Kolon ve Rektum Hastalıkları Dergisi'nde yayınlanmasını pek ala arzu edebilirler. Bu durum çıkar sorunları doğurabilir. Bu yazılar, yazıyı yazan editör(ler) tarafından değerlendirilemez. Bu gibi durumlarda bu süreç, (editörlerin yazı başvurularında) yazıların uzman olan bağımsız kişiler tarafından incelenmesiyle aşılabilir.

Abonelik Bilgileri

Türk Kolon ve Rektum Hastalıkları Dergisi, Türk Kolon ve Rektum Cerrahisi Derneği üyelerine, Dünya'da ve Türkiye'deki kütüphanelere ücretsiz dağıtılmaktadır. Yayınlanmış tüm sayılar ücretsiz olarak şu linkte mevcuttur (http://www.turkishjcrd.com/).

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GENERAL INFORMATION

Turkish Journal of Colorectal Disease (TJCD) is the journal of Turkish Society of Colon and Rectal Surgery. The mission of the Journal is to advance knowledge of disorders of the small intestine, colon, rectum, anus and pelvic floor. It publishes invited review articles, research articles, brief reports and letters to the editor, and case reports that are relevant to the scope of the journal, on the condition that they have not been previously published elsewhere. Basic science manuscripts, such as randomized, cohort, cross-sectional, and case control studies, are given preference. Invited reviews will be considered for peer review from known experts in the area.

Manuscripts should be prepared according to ICMJE guidelines (www.icmje.org). All manuscripts are subject to editorial revision to ensure they conform to the style adopted by the journal. There is a double blind kind of reviewing system.

Reviewed and accepted manuscripts are translated from Turkish to English by the Journal through a professional translation service. Prior to printing, the translations are submitted to the authors for approval or correction requests, to be returned within 7 days. If no response is received from the corresponding author within this period, the translation is checked and approved by the editorial board.

Accepted manuscripts are published in both Turkish and English languages.

All manuscripts submitted to the Turkish Journal of Colorectal Disease are screened for plagiarism using the 'iThenticate' software. Results indicating plagiarism may result in manuscripts being returned or rejected.

Turkish Journal of Colorectal Disease does not charge any article submission or processing charges.

The abbreviation of the Turkish Journal of Colorectal Disease is "TJCD", however, it should be denoted as "Turk J Colorectal Dis" when referenced.

EDITORIAL POLICIES

All manuscripts will be evaluated by the scientific board for their scientific contribution, originality and content. Authors are responsible for the accuracy of the data. The journal retains the right to make appropriate changes on the grammar and language of the manuscript. When suitable the manuscript will be sent to the corresponding author for revision. The manuscript, when published, will become the property of the journal and copyright will be taken out in the name of the journal

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Disclosure Statement

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In the cover letter the authors should state if any of the material in the manuscript is submitted or planned for publication elsewhere in any form including electronic media. A written statement indicating whether or not "Institutional Review Board" (IRB) approval was obtained or equivalent guidelines followed in accordance with the Helsinki Declaration of 2013 update on human experimentation must be stated; if not, an explanation must be provided. The cover letter must contain address, telephone, fax and the e-mail address of the corresponding author.

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The ORCID (Open Researcher and Contributor ID) number of the correspondence author should be provided while sending the manuscript. A free registration can create at http://orcid.org.

Online Submission

Only online submissions are accepted for rapid peer-review and to prevent delay in publication. Manuscripts should be prepared as word document (*.doc) or rich text format (*.rtf). After logging on to the web www. journalagent.com/krhd double click the "submit an article" icon. All corresponding authors should be provided a password and an username after providing the information needed. After logging on the article submission system with your own password and username please read carefully the directions of the system to provide all needed information in order not to delay the processing of the manuscript. Attach the manuscript, all figures, tables and additional documents. Please also attach the cover letter with "Assignment of Copyright and Financial Disclosure" forms.

Manuscript Preparation Guidelines

Turkish Journal of Colorectal Disease follows the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (International Committee of Medical Journal Editors: Br Med J 1988;296:401-5).

Upon submission of the manuscript, authors are to indicate the type of trial/research and statistical applications following "Guidelines for statistical reporting in articles for medical journals: amplifications and explanations" (Bailar JC III, Mosteller F. Ann Intern Med 1988;108:266-73).

Preparation of research articles, systematic reviews and meta-analyses must comply with study design guidelines:

CONSORT statement for randomized controlled trials (Moher D, Schultz KF, Altman D, for the CONSORT Group. The CONSORT statement revised recommendations for improving the quality of reports of parallel group randomized trials. JAMA 2001; 285:1987-91) (http://www.consort-statement.org/);

PRISMA statement of preferred reporting items for systematic reviews and meta-analyses (Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 2009; 6(7): e1000097.) (http://www.prisma-statement.org/);

STARD checklist for the reporting of studies of diagnostic accuracy (Bossuyt PM, Reitsma JB, Bruns DE, Gatsonis CA,

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Glasziou PP, Irwig LM, et al., for the STARD Group. Towards complete and accurate reporting of studies of diagnostic accuracy: the STARD initiative. Ann Intern Med 2003;138:40-4.) (http://www.stard-statement.org/);

STROBE statement, a checklist of items that should be included in reports of observational studies (http://www.strobe-statement.org/);

MOOSE guidelines for meta-analysis and systemic reviews of observational studies (Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting Meta-analysis of observational Studies in Epidemiology (MOOSE) group. JAMA 2000; 283: 2008-12).

Text Formatting

Manuscripts should be submitted in Word.

Use a normal, plain font (e.g., 10-point Times Roman) for text.

Use the automatic page numbering function to number the pages.

Do not use field functions.

Use tab stops or other commands for indents, not the space bar.

Use the table function, not spreadsheets, to make tables.

Save your file in docx format (Word 2007 or higher) or doc format (older Word versions).

Title Page

All manuscripts, regardless of article type, should start with a title page, containing:

The title of the article;

The short title of the article

The initials, names and qualifications of each author;

The main appointment of each author;

The name(s) of the institution(s) of each author;

The name and email address of the corresponding author;

Full disclosures of potential conflicts of interest on the part of any named author, or a statement confirming that there are no conflicts of interest;

The word count excluding abstract, references, tables, figures and legends;

The place and date of scientific meeting in which the manuscript was presented and it's abstract published in the abstract book, if applicable.

Article Types

Original Articles

This category includes original research including both clinical and basic science submissions. The work must be original and neither published, accepted, or submitted for publication elsewhere. Any related work, either SUBMITTED, in press, or published from any of the authors should be clearly cited and referenced.

All clinical trials must be registered in a public trials registry that is acceptable to the International Committee of Medical Journals Editors (ICMJE). Go to (http://www.icmje.org/faq.html). Authors of randomized controlled trials must adhere to the CONSORT guidelines, available at: www.consort-statement.org, and provide both a CONSORT checklist and flow diagram. We require that you choose the MS Word template at www.consort-statement.org for the flow chart and cite/upload it in the manuscript as a figure. In addition, submitted manuscripts must include the unique registration number in the Abstract as evidence of registration.

All authors are expected to abide by accepted ethical standards for human and animal investigation. In studies that involve human subjects or laboratory animals, authors must provide an explicit statement in Materials and Methods that the experimental protocol was approved by the appropriate institutional review committee and meets the guidelines of their responsible governmental agency. In the case of human subjects, informed consent, in addition to institutional review board approval, is required.

Original Articles should not exceed 3000 words (excluding abstract, references, tables, figures and legends) and four illustrations.

Original Articles should be organized as follows:

Abstract: The abstract must contain fewer than 250 words and should be structured as follows:

Aim: What was the purpose of the study?

Method: A brief description of the materials - patients or subjects (i.e. healthy volunteers) or materials (animals) - and methods used.

Results: What were the main findings?

Conclusion: What are the main conclusions or implications of the study?

Keywords: Below the abstract provide up to 6 key words or short phrases. Do not use abbreviations as keywords.

Introduction: State concisely the purpose and rationale for the study and cite only the most pertinent references as background.

Materials and Methods: Describe your selection of the observational or experimental subjects clearly (patients or experimental animals, including controls). Provide an explicit statement that the experimental protocols were approved by the appropriate institutional review committee and meet the guidelines of the responsible governmental agency. In the case of human subjects, state explicitly those subjects have provided informed consent. Identify the methods, apparatus/product** (with manufacturer's name and address in parentheses), and procedures in sufficient detail to allow other workers to reproduce the results. Give references to established methods, including statistical methods; provide references and brief descriptions of methods that have been published but are not well known, describe substantially modified methods, including statistical methods, give reasons for using them, and evaluate their limitations;

Results: Present the detailed findings supported with statistical methods. Figures and tables should supplement, not duplicate the text; presentation of data in either one or the other will suffice. Emphasize only your important observations; do not compare your observations with those of others. Such comparisons and comments are reserved for the discussion section.

Discussion: State the importance and significance of your findings but do not repeat the details given in the Results section. Limit your opinions to those strictly indicated by the facts in your report. Compare your finding with those of others. No new data are to be presented in this section.

Acknowledgments: Only acknowledge persons who have made substantive contributions to the study. Authors are responsible for obtaining written permission from everyone acknowledged by name because readers may infer their endorsement of the data and conclusions. Begin your text of the acknowledgment with, "The authors thank…".

Authorship Contributions: The journal follows the recommendations of the ICMJE for manuscripts submitted to biomedical journals. According to these, authorship should be based on the following four criteria:

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; and

Drafting the work or revising it critically for important intellectual content; and

Final approval of the version to be published; and

Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

All other contributors to the paper should be credited in the 'Acknowledgments' section.

References: The author should number the references in Arabic numerals according to the citation order in the text. Put reference numbers in parenthesis in superscript at the end of citation content or after the cited author's name. Use the form of "Uniform Requirements for manuscript abbreviations in Turk Bilim Terimleri" (http:/www.bilimterimleri.com).

Journal titles should conform to the abbreviations used in "Cumulated Index Medicus".

Journals; Last name(s) of the author(s) and initials, article title, publication title and its original abbreviation, publication date, volume, the inclusive page numbers.

Example: 1. Dilaveris P, Batchvarov V, Gialafos J, Malik M. Comparison of different methods for manual P wave duration measurement in 12-lead electrocardiograms. Pacing Clin Electrophysiol 1999;22:1532-1538.

Book chapter; Last name(s) of the author(s) and initials, chapter title, book editors, book title, edition, place of publication, date of publication and inclusive page numbers of the extract cited.

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Example: 1. Schwartz PJ, Priori SG, Napolitano C. The Long QT Syndrome. In: Zipes DP, Jalife J, eds. Cardiac Electrophysiology. From Cell to Bedside. Philadelphia; WB Saunders Co. 2000:597-615.

Tables: All tables are to be numbered using Arabic numerals. Tables should always be cited in text in consecutive numerical order. For each table, please supply a table caption (title) explaining the components of the table. Identify any previously published material by giving the original source in the form of a reference at the end of the table caption. Footnotes to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data) and included beneath the table body.

Figures: Figures should work under "Windows". Color figures or grayscale images must be at least 300 dpi. Figures using "*.tiff", "*.jpg" or "*.pdf" should be saved separate from the text. All figures should be prepared on separate pages. They should be numbered in Arabic numerals. Each figure must have an accompanying legend defining abbreviations or symbols found in the figure. Figures could be submitted at no additional cost to the author.

Units of Measurement and Abbreviations: Units of measurement should be in Systéme International (SI) units. Abbreviations should be avoided in the title. Use only standard abbreviations. If abbreviations are used in the text, they should be defined in the text when first used.

Permissions: Authors wishing to include figures, tables, or text passages that have already been published elsewhere are required to obtain permission from the copyright owner(s) and to include evidence that such permission has been granted when submitting their papers. Any material received without such evidence will be assumed to originate from the authors.

Invited Review Articles

Abstract length: Not to exceed 250 words.

Article length: Not to exceed 4000 words.

Reference Number: Not to exceed 100 references.

Reviews should include a conclusion, in which a new hypothesis or study about the subject may be posited. Do not publish methods for literature search or level of evidence. Authors who will prepare review articles should already have published research articles on the relevant subject. The study's new and important findings should be highlighted and interpreted in the Conclusion section. There should be a maximum of two authors for review articles.

Case Reports

Abstract length: Not to exceed 100 words.

Article length: Not to exceed 1000 words.

Reference Number: Not to exceed 15 references.

Case Reports should be structured as follows:

Abstract: An unstructured abstract that summarizes the case.

Introduction: A brief introduction (recommended length: 1-2 paragraphs).

Case Report: This section describes the case in detail, including the initial diagnosis and outcome.

Discussion: This section should include a brief review of the relevant literature and how the presented case furthers our understanding to the disease process.

References: See under 'References' above.

Acknowledgments.

Tables and figures.

Technical Notes

Abstract length: Not to exceed 250 words.

Article length: Not to exceed 1200 words.

Reference Number: Not to exceed 15 references.

Technical Notes include description of a new surgical technique and its application on a small number of cases. In case of a technique representing a major breakthrough one case will suffice. Follow-up and outcome need to be clearly stated.

Technical Notes should be organized as follows:

Abstract: Structured "as above mentioned".

Indications

Method

Comparison with other methods: advantages and disadvantages, difficulties and complications.

References, in Vancouver style (see under 'References' above).

Acknowledgments.

Tables and figures: Including legends.

Letters to the Editor

Article length: Not to exceed 500 words.

Reference Number: Not to exceed 10 references

We welcome correspondence and comment on articles published in Turkish Journal of Colorectal Disease. No abstract is required, but please include a brief title. Letters can include 1 figure or table.

Video Article

Article length: Not to exceed 500 words.

Reference Number: Not to exceed 5 references

Briefly summarize the case describing diagnosis, applied surgery technique and outcome. Represent all important aspects, i.e. novel surgery technique, with properly labelled and referred video materials. A standalone video vignette, describing a surgical technique or interesting case encountered by the authors.

Requirements: The data must be uploaded during submission with other files. The video should be no longer than 10 minutes in duration with a maximum file size of 350Mb and 'MOV, MPEG4, AVI, WMV, MPEGPS, FLV, 3GPP, WebM' format should be used. Documents that do not exceed 100 MB can be uploaded within the system. For larger video documents, please contact iletisim@galenos.com.tr All videos must include a narration in English. Reference must be used as it would be for a Figure or a Table. Example: ".....To accomplish this, we developed a novel surgical technique (Video 1)." All names and institutions should be removed from all video materials. Video materials of accepted manuscripts will be published online.

Letters to the Editor

Article length: Not to exceed 500 words.

Reference Number: Not to exceed 10 references

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This journal is committed to upholding the integrity of the scientific record. As a member of the Committee on Publication Ethics (COPE) the journal will follow the COPE guidelines on how to deal with potential acts of misconduct.

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The manuscript has not been submitted to more than one journal for simultaneous consideration.

The manuscript has not been published previously (partly or in full), unless the new work concerns an expansion of previous work (please provide transparency on the re-use of material to avoid the hint of text-recycling ("self-plagiarism").

A single study is not split up into several parts to increase the quantity of submissions and submitted to various journals or to one journal over time (e.g. "salami-publishing").

No data have been fabricated or manipulated (including images) to support your conclusions.

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All individuals have individual rights that are not to be infringed. Individual participants in studies have, for example, the right to decide what happens to the (identifiable) personal data gathered, to what they have said during a study or an interview, as well as to any photograph that was taken. Hence it is important that all participants gave their informed consent in writing prior to inclusion in the study. Identifying details (names, dates of birth, identity numbers and other information) of the participants that were studied should not be published in written descriptions, photographs, and genetic profiles unless the information is essential for scientific purposes and the participant (or parent or guardian if the participant is incapable) gave written informed consent for publication. Complete anonymity is difficult to achieve in some cases, and informed consent should be obtained if there is any doubt. For example, masking the eye region in photographs of participants is inadequate protection of anonymity. If identifying characteristics are altered to protect anonymity, such as in genetic profiles, authors should provide assurance that alterations do not distort scientific meaning.

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Each manuscript submitted to The Turkish Journal of Colorectal Disease is subject to an initial review by the editorial office in order to determine if it is aligned with the journal's aims and scope, and complies with essential requirements. Manuscripts sent for peer review will be assigned to one of the journal's associate editors that has expertise relevant to the manuscript's content. All accepted manuscripts are sent to a statistical and English language editor before publishing. Once papers have been reviewed, the reviewers' comments are sent to the Editor, who will then make a preliminary decision on the paper. At this stage, based on the feedback from reviewers, manuscripts can be accepted, rejected, or revisions can be recommended. Following initial peer-review, articles judged worthy of further consideration often require revision. Revised manuscripts generally must be received within 2 months of the date of the initial decision. Extensions must be requested from the Associate Editor at least 2 weeks before the 2-month revision deadline expires; The Turkish Journal of Colorectal Disease will reject manuscripts that are not received within the 3-month revision deadline. Manuscripts with extensive revision recommendations will be sent for further review (usually by the same reviewers) upon their re-submission. When a manuscript is finally accepted for publication, the Technical Editor undertakes a final edit and a marked-up copy will be e-mailed to the corresponding author for review and to make any final adjustments.

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When submitting a revised version of a paper, the author must submit a detailed "Response to the reviewers" that states point by point how each issue raised by the reviewers has been covered and where it can be found (each reviewer's comment, followed by the author's reply and line numbers where the changes have been made) as well as an annotated copy of the main document. Revised manuscripts must be submitted within 30 days from the date of the decision letter. If the revised version of the manuscript is not submitted within the allocated time, the revision option may be canceled. If the submitting author(s) believe that additional time is required, they should request this extension before the initial 30-day period is over.

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The Turkish Journal of Colorectal Disease publishes abstracts of accepted manuscripts online in advance of their publication in print. Once an accepted manuscript has been edited, the authors have submitted any final corrections, and all changes have been incorporated, the manuscript will be published online. At that time the manuscript will receive a Digital Object Identifier (DOI) number. Both forms can be found at www.journalagent.com/krhd. Authors of accepted manuscripts will receive electronic page proofs directly from the printer, and are responsible for proofreading and checking the entire manuscript, including tables, figures, and references. Page proofs must be returned within 48 hours to avoid delays in publication.

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Yazarlara Bilgi

GENEL BİLGİ

Türk Kolon ve Rektum Hastalıkları Dergisi, Türk Kolon ve Rektum Cerrahisi Derneği'nin dergisidir. Derginin misyonu; ince bağırsak, kolon, rektum, anüs ve pelvik taban bozuklukları hakkındaki bilgiye katkı sağlamaktır. Dergi daha önce başka bir yerde yayınlanmamış olması koşuluyla, derginin kapsamı ile ilgili ve talep üzerine yazılan derleme makaleleri, araştırma makaleleri, kısa raporlar ve editöre mektuplar ve olgu sunumlarını yayınlamaktadır. Randomize, kohort, kesitsel ve vaka kontrol çalışmaları gibi temel bilim yazılarına öncelik verilir. Alanında bilinen uzmanlarca talep üzerine yazılan derlemeler dikkate alınacaktır.

Yazılar ICMJE yönergelerine göre (http://www.icmje.org/) hazırlanmalıdır. Tüm yazılar dergi tarafından benimsenen stile uygunluk sağlamak için editöryal kontrol ve düzeltmelere tabi tutulmaktadır. Derginin çift kör bir değerlendirme sistemi vardır. Değerlendirilen ve kabul edilen yayınlar Türkçeden İngilizceye veya İngilizceden Türkçeye derginin profesyonel çeviri hizmeti aracılığıyla tercüme edilir. Yayınlanmadan önce, çeviriler onay veya düzeltme istekleri için yazarlara gönderilir ve 7 gün içinde geri dönüş talep edilir. Bu süre içinde yanıt alınamazsa, çeviri kontrol ve yayın kurulu tarafından onaylanır.

Kabul edilen yayınlar hem Türkçe hem de İngilizce olarak yayınlanır.

Türk Kolon ve Rektum Hastalıkları Dergisi'ne gönderilen tüm yayınlar 'iThenticate' yazılımı kullanılarak intihal açısından taranır. İntihal saptanan durumlarda yayın iade veya reddedilir.

Türk Kolon ve Rektum Hastalıkları Dergisi, makale gönderme veya işlem ücreti adı altında herhangi bir ücret talep etmemektedir.

Türk Kolon ve Rektum Hastalıkları Dergisi'nin kısaltması "TJCD"dir, ancak, refere edildiğinde "Turk J Colorectal Dis" olarak kullanılmalıdır.

YAYIN POLİTİKASI

Tüm makaleler bilimsel katkıları, özgünlük ve içerikleri açısından bilimsel komite tarafından değerlendirilecektir. Yazarlar verilerinin doğruluğundan sorumludurlar. Dergi gerekli gördüğü yerlerde dil ve uygun değişiklik yapma hakkını saklı tutar. Gereğinde makale revizyon için yazara gönderilir. Dergide basılan yayın derginin malı haline gelir ve telif hakkı "Türk Kolon ve Rektum Hastalıkları Dergisi" adına alınmış olur. Daha önce herhangi bir dilde yayınlanmış makaleler dergide yayınlanmak üzere kabul edilmeyecektir. Yazarlar bir başka dergide yayınlanmak üzere olan makaleyi teslim edemez. Tüm değişiklikler, yazar ve yayıncının yazılı izin alındıktan sonra yapılacaktır. Tüm makalelerin tam metinleri derginin www.journalagent.com/krhd web sitesinden indirilebilir.

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Telif hakkı devir bildirimi

Açıklama bildirimi

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İnsan katılımcılı araştırma ve/veya hayvan deneyleri

Bilgilendirilmiş Onam

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Gecikmeyi önlemek ve hızlı hakemlik için sadece çevrim içi gönderimler kabul edilir. Yazılar word belgesi (*.doc) veya zengin metin biçimi (*.rtf) olarak hazırlanmalıdır. www.journalagent.com/krhd adresinde web oturumu açtıktan sonra "Makale gönder" ikonuna tıklayın. Tüm yazarlar, gerekli bilgileri sisteme girdikten sonra bir şifre ve bir kullanıcı adı alır. Kendi şifre ve kullanıcı adınız ile makale gönderme sistemine kayıt olduktan sonra yazının işleme alınmasında bir gecikme olmaması için gerekli tüm bilgileri sağlamak için sistemin yönergelerini dikkatlice okuyunuz. Makaleyi ve tüm şekil, tablo ve ek dökümanları ekleyiniz. Ayrıca üst yazı ve "Telif Hakkı ve Finansal Durum" formunu ve yazının tipine göre aşağıda belirtilen kılavuzların kontrol listesini ekleyiniz.

Makale Hazırlama Kuralları

Türk Kolon ve Rektum Hastalıkları Dergisi "Biyomedikal Dergilere Gönderilen Makaleler için Gerekli Standartları" izler. (International Committee of Medical Journal Editors: Br Med J 1988; 296: 401-5).

Yazarlar yayınlarını gönderirken, çalışmalarının türünü ve uygulanan istatistik yöntemlerini "Tıbbi Dergilere Gönderilen Makaleler için İstatistiksel Raporlama Rehberi"ne uygun olarak belirtmelidir (Bailar JC III, Mosteller F. Ann Intern Med 1988;108:266-73).

Araştırma makalesi, sistematik değerlendirme ve meta-analizin hazırlanması aşağıdaki çalışma tasarımı kurallarına uymak zorundadır; (CONSORT statement for randomized controlled trials (Moher D, Schultz KF, Altman D, for the CONSORT Group.

The CONSORT statement revised recommendations for improving the quality of reports of parallel group randomized trials. JAMA 2001; 285:1987-91) (http://www.consort-statement.org/);

PRISMA statement of preferred reporting items for systematic reviews and meta-analyses (Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 2009; 6(7): e1000097.) (http://www.prisma-statement.org/);

STARD checklist for the reporting of studies of diagnostic accuracy (Bossuyt PM, Reitsma JB, Bruns DE, Gatsonis CA, Glasziou PP, Irwig LM, et al., for the STARD Group. Towards complete and accurate reporting of studies of diagnostic accuracy: the STARD initiative. Ann Intern Med 2003;138:40-4) (http://www.stard-statement.org/);

STROBE statement, a checklist of items that should be included in reports of observational studies (http://www.strobe-statement.org/);

MOOSE guidelines for meta-analysis and systemic reviews of observational studies (Stroup DF, Berlin JA, Morton SC, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting Meta-analysis of observational Studies in Epidemiology (MOOSE) group. JAMA 2000; 283: 2008-12).

Metin Biçimlendirme

Yazılar Word programı ile hazırlanarak teslim edilmelidir.

- Metin için normal, düz yazı tipi kullanın (örneğin, 10 punto Times Roman).

- Sayfa numarası için otomatik sayfa numaralandırma işlevini kullanın.

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- Alan fonksiyonları kullanmayın.

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- Tablo yapmak için diğer işlevleri değil, elektronik tablo fonksiyonunu kullanın.

- Dosyanızı .docx formatında (Word 2007 veya üstü) ya da .doc formatında (eski Word sürüm) kaydedin.

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Tüm yazılar, makale türü ne olursa olsun, aşağıdakileri içeren bir başlık sayfası ile başlamalıdır:

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- Makalenin kısa başlığı;

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Makale Tipleri

Orijinal Makaleler

Bu kategori, klinik ve temel bilimde orijinal araştırmaları içerir. Yayın orijinal olmalı ve başka bir dergide yayınlanmış/gönderilmiş ya da kabul edilmiş olmamalıdır. Yazarlar, herhangi biri tarafından bir dergiye gönderilmiş, baskıda veya basılmış ilgili herhangi bir çalışmaya atıfta bulunmak istiyorlarsa açıkça atıfta bulunulmalı ve kaynak gösterilmelidir.

Tüm klinik çalışmalar, Uluslararası Tıp Dergisi Editörler Komitesince (ICMJE) kabul gören bir kayıt sistemine kayıtlı olmalıdır. Bunun için http://www.icmje.org/faq.html adresine müracaat edin. Randomize kontrollü çalışmaların yazarları da, www.consort-statement.org adresinden başvurulabilen CONSORT kılavuzuna uymalıdır ve yayınlarıyla birlikte CONSORT kontrol listesi ve akış diyagramı tebliğ edilmelidir. Akış şeması olarak www.consort-statement.org adresinde bulunan MS Word şablonunun kullanılması ve bunun yayının içinde bir alıntı veya bir figür olarak yerleştirilmesi gereklidir. Buna ek olarak, sunulan yayınlar her yayına spesifik verilen özel kayıt numarasını içermelidir.

Tüm yazarların, insan üzerindeki çalışmalar ve hayvan deneylerinde etik standartlara uymaları beklenmektedir. İnsan üzerindeki veya laboratuvar hayvanları içeren çalışmalarda, yazarların yayının Gereç ve Yöntem kısmında deney protokolünün ilgili kurumsal inceleme komitesi tarafından onaylandığını ve sorumlu devlet kurumu kurallarına uyduğunu açık bir dille açıklamaları gereklidir. İnsan üzerindeki çalışmalarda kurumsal inceleme kurulu onayına ek olarak, aydınlatılmış onam da bulunmalıdır.

Orijinal Makaleler (özet, kaynaklar, tablolar, rakamlar hariç) 3000 kelime ve dört figürü aşmamalıdır.

Orijinal Makaleler aşağıdaki gibi organize edilmelidir:

Özet: Özet 250 kelimeyi geçmemeli ve şunları içermelidir;

Amaç: Çalışmanın amacı nedir?

Yöntem: Kullanılan yöntem ve materyaller (örneğin hayvanlar) veya hastalar ya da konu (sağlıklı gönüllüler gibi) hakkında kısa bir açıklama içermelidir.

Bulgular: Ana bulgular nelerdir?

Sonuç: Çalışmanın ana sonuçları ve etkileri nelerdir?

Anahtar kelimeler: Özetin altında en az 3 anahtar kelime veriniz. Kısaltmaları anahtar kelime olarak kullanmayınız.

Giriş: Açık bir dille çalışmanın amaç ve gerekçesini belirtin ve çalışmanın arka planını açıklarken sadece en önemli kaynaklardan alıntı yapın.

Gereç ve Yöntem: Gözlemsel veya deneysel deneklerin (hastalar, deney hayvanları veya kontrol grupları dahil) seçim şeklini açıklayın. Deney protokolünün ilgili kurumsal inceleme komitesi tarafından onaylandığını ve ilgili devlet kurumu kurallarına uyduğunu açık bir dille açıklayın. İnsan çalışması durumunda, tüm şahısların aydınlatılmış onamlarının alındığını açık bir dille belirtin. Yöntem, cihaz ve ürünleri tanımlayın (Parantez içinde üretici firma adı ve adresi)** Uygulanmış olan tüm prosedürler, diğer çalışmacıların aynı deneyi tekrar edebilecekleri detay ve netlikte anlatılmalıdır. İstatistiksel yöntemler de dahil olmak üzere yerleşik ve yaygın olarak bilinen çalışma yöntemleri için kaynaklar belirtilmelidir. Yayınlanmış ancak yaygın olarak bilinmeyen yöntemler için ise kaynaklar ve kısa tanımlamalar verilmelidir. Kullanma sebepleri ve limitasyonları belirtilmelidir.

Bulgular: İstatistiksel yöntemlerle desteklenmiş bulgularınızı ayrıntılı olarak sunun. Şekil ve tablolar metni tekrar değil, takviye etmelidir. Verilerin hem metinde hem figür olarak verilmemesi gerekir. Metin veya figürden birisi olarak verilmesi yeterlidir. Sadece kendi önemli izlenimlerinizi belirtin. Kendi izlenimlerinizi diğerlerininkiyle karşılaştırmayın. Bu tür karşılaştırma ve yorumlar tartışma bölümünde yapılmalıdır.

Tartışma: Bulgularınızın önem ve anlamını vurgulayın ancak bulgular kısmında verilenleri tekrarlamayın. Fikirlerinizi yalnızca bulgularınızla kanıtlayabildiklerinizle sınırlı tutun. Bulgularınızı diğerlerininkiyle karşılaştırın. Bu bölümde yeni veriler bulunmamalıdır.

Teşekkür: Sadece çalışmaya ciddi katkılarda bulunmuş kişilere teşekkür edin. Yazarlar ismen teşekkür ettikleri herkesten yazılı izin almak zorundadır. Teşekkür kısmına "Yazarlar ….teşekkür eder" şeklinde başlayın.

Yazarlık ve Katkı Sağlayanlar: Dergi, biyomedikal dergilere gönderilen yayınlara yönelik ICMJE tavsiyelerini izler. Buna göre "yazarlık" aşağıdaki dört kritere dayalı olmalıdır:

Yazar;

- Yayının konsept veya dizaynına, çalışmanın verilerinin elde edilmesine, analizine ve yorumlanmasına önemli katkılar veren; ve

- İşi hazırlayan veya entellektüel içerik açısından eleştirel biçimde gözden geçiren; ve

- Yayınlanacak son şekli onaylayan; ve

- Çalışmanın her bir bölümünün doğruluğu ve bütünlüğü ile ilgili sorunları uygun bir şekilde inceleyen ve çözüm sağlayan sorumlu kişidir.

Bu şartların hepsini sağlamayan diğer tüm katılımcılar yazar değil, "Teşekkür" bölümünde anılması gereken katkı sağlamış kişilerdir.

Kaynaklar: Kaynakları 1'den başlayarak Arap rakamları ve alfabetik sıra ile verin. Kaynak numaraları cümle sonunda noktadan sonra üstte küçük rakamlar şeklinde (superscript) yazılmalıdır. Kısaltmalar için gerekli standartları http:/www.bilimterimleri.com adresinde bulunan Türk Bilim Terimleri Kılavuzu'ndan edinin.

Dergi başlıkları "Cumulated Index Medicus" kısaltmalarına uygun olmalıdır.

Dergiden: Yazar/yazarların soyadı ve adının ilk harfi, makale başlığı, dergi başlığı ve derginin özgün kısaltması, yayın tarihi, baskı, kapsayıcı sayfa numaralarını içermelidir.

Örneğin: 1. Dilaveris P, Batchvarov V, Gialafos J, Malik M. Comparison of different methods for manual P wave duration measurement in 12-lead electrocardiograms. Pacing Clin Electrophysiol 1999;22:1532-1538.

Kitap Bölümü: Yazar/yazarların soyadı ve adının ilk harfi, bölüm başlığı, kitap editörleri, kitap başlığı, basım, yayın yeri, yayın tarihi, kapsadığı sayfa numaralarını içermelidir

Örneğin: 1. Schwartz PJ, Priori SG, Napolitano C. The Long QT Syndrome. In: Zipes DP, Jalife J, eds. Cardiac Electrophysiology. From Cell to Bedside. Philadelphia; WB Saunders Co. 2000:597-615.

Tablolar: Tüm tablolar Arapça sayılarla numaralandırılmalıdır. Tüm tablolardan metin içerisinde numara sırası ile bahsedilmelidir. Her tablo için tablonun içeriği hakkında bilgi veren bir başlık verin. Başka yayından alıntı olan tüm tabloları tablonun alt kısmında kaynak olarak belirtin. Tabloda dipnotlar tablonun altında, üst karakter olarak küçük harflerle verilmelidir. İstatistiksel anlamlı değerler ve diğer önemli istatistiksel değerler yıldız ile işaretlenmelidir.

Şekiller: Şekillerin "Windows" ile açılması gerekir. Renkli şekiller veya gri tonlu görüntüler en az 300 dpi olmalıdır. Şekiller ana metinden ayrı olarak "*.tiff", "*.jpg" veya "*.pdf" formatında kaydedilmelidir. Tüm şekil ayrı bir sayfada hazırlanmalı ve Arap rakamları ile numaralandırılmalıdır. Her şekilde kendisindeki işaret ve sembolleri açıklayan bir alt yazı olmalıdır. Şekil gönderme için yazardan hiçbir ek ücret alınmaz.

Ölçü Birimleri ve Kısaltmalar: Ölçü birimleri System International (SI) birimleri cinsinden olmalıdır. Kısaltmalardan başlıkta kaçınılmalıdır. Sadece standart kısaltmalar kullanın. Metinde kısaltma kullanılırsa ilk kullanıldığı yerde tanımlanmalıdır.

İzinler: Yazarlar yayınlarına önceden başka bir yerde yayınlanmış şekil, tablo, ya da metin bölümleri dahil etmek isterlerse telif hakkı sahiplerinden izin alınması ve bu izin belgelerinin yayınla beraber değerlendirmeye gönderilmesi gerekmektedir. Böyle bir belgenin eşlik etmediği her materyalin yazara ait olduğu kabul edilecektir.

Davetli (Talep üzerine yazılan) Derlemeler

Özet uzunluğu: 250 kelimeyi aşmamalıdır.

Makale uzunluğu: 4000 kelimeyi aşmamalıdır.

Kaynak sayısı: 100 kaynağı aşmamalıdır.

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Derlemeler, üzerine konuyla ilgili yeni bir hipotez ya da çalışma oturtulabilecek bir sonuç içermelidir. Literatür taraması metodlarını veya kanıt düzeyi yöntemlerini yayınlamayın. Derleme makaleleri hazırlayacak yazarların ilgili konuda önceden araştırma makaleleri yayımlamış olması gerekir. Çalışmanın yeni ve önemli bulguları sonuç bölümünde vurgulanır ve yorumlanmalıdır. Derlemelerde maksimum iki yazar olmalıdır.

Olgu Sunumları

Özet uzunluğu: 100 kelimeyi aşmamalıdır.

Makale uzunluğu: 1000 kelimeyi aşmamalıdır.

Kaynak sayısı: 15 kaynağı aşmamalıdır.

Olgu Sunumları aşağıdaki gibi yapılandırılmalıdır:

Özet: Olguyu özetleyen bir yapılandırılmamış özet (gereç ve yöntem, bulgular, tartışma gibi bölümlerin olmadığı).

Giriş: Kısa bir giriş (tavsiye edilen uzunluk: 1-2 paragraf).

Olgu Sunumu: Bu bölümde ilk tanı ve sonuç da dahil olmak üzere olgu ayrıntılı olarak anlatılır.

Tartışma: Bu bölümde ilgili literatür kısaca gözden geçirilir ve sunulan olgunun, hastalığa bakışımızı ve yaklaşımımızı nasıl değiştirebileceği vurgulanır.

Kaynaklar: Vancouver tarzı, (yukarıda 'Kaynaklar' bölümüne bakınız).

Teşekkür

Tablolar ve şekiller

Teknik Notlar

Özet uzunluğu: 250 kelimeyi aşmamalıdır.

Makale uzunluğu: 1200 kelimeyi aşmamalıdır.

Kaynak Sayısı: 15 kaynağı aşmamalıdır.

Teknik Notlar, yeni bir cerrahi tekniğin açıklanmasını ve az sayıda olguda uygulanmasını içermektedir. Büyük bir atılım/değişikliği temsil eden bir tekniğin sunulması durumunda tek bir olgu yeterli olacaktır. Hastanın takip ve sonucu açıkça belirtilmelidir.

Teknik Notlar aşağıdaki gibi organize edilmelidir:

Özet: Aşağıdaki gibi yapılandırılmalıdır:

Amaç: Bu çalışmanın amacı nedir?

Yöntem: Kullanılan yöntemlerin, hastalar ya da sağlıklı gönüllülerin veya hayvanların tanımı, malzemeler hakkında kısa bir açıklama.

Bulgular: Ana bulgular nelerdir?

Sonuç: Bu çalışmanın ana sonuçları ve etkileri nelerdir?

Endikasyonları

Yöntem

Diğer yöntemlerle karşılaştırılması: Avantaj ve dezavantajları, zorluklar ve komplikasyonlar.

Kaynaklar: Vancouver tarzı (yukarıda 'Kaynaklar' bölümüne bakınız)

Teşekkür

Tablolar ve şekiller; alt yazıları dahil

Video Makale

Makale Uzunluğu: 500 kelimeyi aşmamalıdır.

Kaynak Sayısı: 5 kaynağı aşmamalıdır.

Tanıyı, uygulanan cerrahi tekniği ve sonucu açıklayarak olguyu kısaca özetleyiniz. Uygun şekilde adlandırılmış ve referans edilmiş video materyalleri ile tüm önemli noktaları, örn; yeni cerrahi tekniği, belirtiniz. Materyaller, yazarların cerrahi tekniğini anlattıkları veya karşılaştıkları ilginç vakalardan oluşmalıdır.

Teknik Gereklilikler: Veriler, makale yükleme sırasında diğer dosyalarla birlikte eklenmelidir. Video süresinin 10 dakikayı geçmemesi kaydıyla dosya boyutu maksimum 350 MB olmalı ve 'MOV, MPEG4, AVI, WMV, MPEGPS, FLV, 3GPP, WebM' formatlarından biri kullanılmalıdır. 100 MB'yi aşmayan video dokümanları sisteme yüklenebilir. Daha büyük video dokümanları için lütfen iletisim@galenos.com.tr adresinden bizimle iletişime geçiniz. Tüm video seslendirmeleri İngilizce olmalıdır. Video atıfları, Şekil veya Tablo atıfları ile aynı biçimde kullanılmalıdır. Örneğin; "….Bunu gerçekleştirmek için, yeni bir cerrahi teknik geliştirdik (Video 1)." Video materyallerinde isim ve kurumlar yer almamalıdır. Kabul edilen makalelerin video materyalleri online yayınlanacaktır.

Editöre Mektuplar

Makale uzunluğu: 500 kelimeyi aşmamalıdır.

Kaynak Sayısı: 10 kaynağı aşmamalıdır.

Türk Kolon ve Rektum Hastalıkları Dergisi'nde yayınlanan makaleler hakkında yorumlar memnuniyetle kabul edilir. Özet gerekli değildir, ancak lütfen kısa bir başlık ekleyiniz. Mektuplar bir şekil veya tablo içerebilir.

Editöryal Yorumlar

Makale uzunluğu: 1000 kelimeyi aşmamalıdır.

Kaynak Sayısı: 10 kaynağı aşmamalıdır.

Editöryal yorumlar sadece editör tarafından kaleme alınır. Editöryal yorumlarda aynı konu hakkında başka yerlerde yayınlanmış yazılar hakkında fikir veya yorumlar belirtilir. Tek bir yazar tercih edilir. Özet gerekli değildir, ancak lütfen kısa bir başlık ekleyiniz. Editöryal gönderimler revizyon/gözden geçirme talebine tabi tutulabilir. Editörler, metin stilini değiştirme hakkını saklı tutar.

Etik

Bu dergi, bilimsel kayıtların bütünlüğünü korumayı tahhüt etmektedir. Yayın Etik Komitesi (COPE) üyesi olarak, dergi olası olumsuz davranışlarla nasıl başa çıkılacağı konusunda Yayın Etik Komitesi (COPE) kılavuzlarını takip edecektir.

Yazarlar araştırma sonuçlarını yanlış sunmaktan; derginin güvenilirliğine, bilimsel yazarlık profesyonelliğine ve en sonunda tüm bilimsel çabalara zarar verebileceğinden dolayı, sakınmalıdır. Araştırma bütünlüğünün sürdürülmesi ve bunun sunumu, iyi bilimsel uygulama kurallarını takip ederek başarılır. Bu da şunları içerir:

- Yazılı eser değerlendirilmek üzere eş zamanlı birden fazla dergiye gönderilmemelidir.

- Yazılı eser daha önceki bir eserin geliştirilmesi olmadıkça, daha önce (kısmen ya da tamamen) yayınlanmamış olmalıdır. [Metnin yeniden kullanıldığı imasından kaçınmak için tekrar kullanılabilir materyallerde şeffaflık sağlayın ("self-plagiarism""kişinin kendinden intihali")].

- Tek bir çalışma; sunum miktarını arttırmak için birçok parçaya bölünmemeli ve zaman içinde aynı ya da çeşitli dergilere gönderilmemelidir. (örneğin "salam-yayıncılık" "salamizasyon").

- Veriler, sonuçlarınızı desteklemek için fabrikasyon (uydurma) ya da manüple edilmiş olmamalıdır.

- Yazarın kendine ait olmayan hiçbir veri, metin veya teori kendininmiş gibi sunulmamalıdır (intihal). Diğer eserlerin kullanımı, (eserin birebir kopyalanması, özetlenmesi ve/veya başka kelimeler kullanarak açıklanmasını da içeren) ya telif hakkı korunacak şekilde izin alınarak ya da tırnak işareti içinde birebir kopyalanarak uygun onay ile kullanılmalıdır.

Önemli not; Türk Kolon ve Rektum Hastalıkları Dergisi intihal taramak için bir program (iThenticate) kullanmaktadır.

- Eser sunulmadan önce sorumlu makamlardan ve çalışmanın yapıldığı enstitü/kuruluşlardan-zımnen veya açıkça-onay alınmasının yanı sıra tüm yazarlardan açıkça onay alınmış olmalıdır.

- Sunulan eserde yazar olarak ismi olanların, bilimsel çalışmaya yeterince katkısı olmuş olmalıdır ve ortak mesuliyet ve sorumluluğu olmalıdır.

Bununla beraber:

- Yazarlık veya yazarların sıra değişiklikleri eserin kabulünden sonra yapılamaz

- Yazının revizyon aşamasında, yayın öncesi veya yayınlandıktan sonra yazar isim eklenmesi veya çıkarılması istemi; ciddi bir konudur ve geçerli sebepler olduğunda değerlendirilebilir. Yazar değişikliği gerekçesi; haklı gerekçeli, inandırıcı ve sadece tüm yazarların yazılı onayı alındıktan sonra; ve yeni/silinmiş yazarın rolü silme hakkında ikna edici ayrıntılı bir açıklama ile kabul edilebilir. Revizyon aşamasında değişiklik olması halinde, bir mektup revise edilmiş yayına eşlik etmelidir. Yayına kabul edildikten veya yayınlandıktan sonra değişiklik olması halinde, bu istek ve gerekli dökümantasyonun yayıncı yoluyla editöre gönderilmesi gerekmektedir. Gerek görüldüğünde bu isteğin gerçekleşmesi için daha fazla doküman talep edilebilir. Değişikliğin kabul veya red kararı dergi editörü insiyatifindedir. Bu nedenle, yayının gönderilmesi aşamasında yazar/yazarlar; gönderecekleri ilgili yazar grubunun isim doğruluğundan sorumludur.

- Yazarlardan sonuçların geçerliliğini doğrulamak amacıyla verilerin ilgili belgelerinin istenmesi halinde bu verileri göndermek için hazır bulundurulmalıdır. Bunlar, ham veri, örnekler, kayıt vb. şeklinde olabilir.

Görevi kötüye kullanma ya da suistimal şüphesi halinde dergi COPE yönergeleri izleyerek bir soruşturma yürütecektir. Soruşturmanın ardından, iddia geçerli görünüyorsa, yazara sorunu gidermek için bir fırsat verilecektir.

Usulsüzlük, şüphe seviyesinde kaldığında; dergi editörü aşağıdaki yollardan birine başvurabilir;

- Makale halen şüpheli ise, reddedilip yazara iade edilebilir.

- Makele online yayınlanmış ise; hatanın mahiyetine bağlı olarak ya yazım hatası olarak kabul edilecek ya da daha ciddi durumlarda makale geri çekilecektir.

- Hatalı yayın ve geri çekme durumlarında açıklayıcı not yayınlanır ve yazarın kurumu bilgilendirilir.

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İnsan ve Hayvan Araştırmaları

İnsan Hakları Beyannamesi

İnsan katılımlı araştırmalar; 1964 Helsinki Deklarasyonu'na ve sonrasında yayımlanan iyileştirici ilkelere uygun olmalıdır ve yazarlar tarafından kurumsal ve/veya ulusal etik kurul komitelerine başvurulup onay alınmış olduğu beyan edilmelidir.

Araştırmanın 1964 Helsinki Deklarasyonu veya kıyaslanabilir standartlara göre yürütülmesi ile ilgili şüphe durumunda, yazarlar bu durumun nedenlerini açıklamak zorundadır ve bağımsız etik kurulları veya diğer değerlendirme kurulları aracılığıyla şüphelerin giderilmesi gerekmektedir.

Aşağıda belirtilen durumlar yazı içerisinde "Kaynaklar" bölümünden önce yer almalıdır:

Etik Kurul Onayı: "Çalışmada insanlara uygulanan tüm prosedürler kurumsal ve ulusal araştırma kurullarının etik standartlarına, 1964 Helsinki Deklarasyonu'na ve sonrasında yayımlanan iyileştirici ilkelere uygun olmalıdır."

Retrospektif çalışmalarda, aşağıda belirtilen cümle yer almalıdır.

"Bu tür çalışmalarda yazılı onam gerekmemektedir."

Hayvan Hakları Beyannamesi

Araştırmalarda kullanılan hayvanların refahına saygı gösterilmelidir. Hayvan deneylerinde, yazarlar hayvanların bakımında ve kullanımında uluslararası, ulusal ve/veya kurumsal olarak oluşturulmuş kılavuzlara uymalıdır ve çalışmalar için kurumdaki veya çalışmanın yapıldığı veya yürütüldüğü merkezdeki (eğer böyle bir merkez varsa) Klinik Araştırmalar Etik Kurulundan onay alınmalıdır. Deneysel hayvan çalışmalarında "Guide for the care and use of laboratory animals http://oacu.od.nih.gov/regs/guide/guide.pdf doğrultusunda hayvan haklarını koruduklarını belirtmeli ve kurumlarından etik kurul onay raporu almalıdırlar.

Hayvanlar ile yürütülen çalışmalarda, aşağıda belirtilen durumlar yazı içerisinde 'Kaynaklar' bölümünden önce yer almalıdır:

Etik Kurul Onayı: "Hayvanların bakımı ve kullanımı ile ilgili olarak uluslararası, ulusal ve/veya kurumsal olarak oluşturulmuş tüm kılavuzlara uyulmuştur."

Eğer uygun bulunduysa (komitenin bulunduğu merkezde): "Hayvan çalışmalarında yapılan tüm uygulamalar kurumsal veya çalışmanın yürütüldüğü merkez tarafından belirlenmiş etik kurallara uyumludur."

Eğer makale insan ya da hayvan katılımlı bir çalışma değilse, lütfen aşağıda yer alan uygun durumlardan birini seçiniz:

"Bu makalenin yazarları insan katılımlı bir çalışma olmadığını bildirmektedir."

"Bu makalenin yazarları çalışmada hayvan kullanılmadığını bildirmektedir."

"Bu makalenin yazarları insan katılımlı veya hayvan kullanılan bir çalışma olmadığını bildirmektedir."

Bilgilendirilmiş Onam

Bütün bireyler ihlal edilemeyecek kişisel haklara sahiptir. Çalışmada yer alan bireyler, elde edilen kişisel bilgilere, çalışmada geçen görüşmelere ve elde edilen fotoğraflara ne olacağı konusunda karar verebilme hakkına sahiptir. Bundan dolayı, çalışmaya dahil etmeden önce yazılı bilgilendirilmiş onam alınması önemlidir. Bilimsel olarak gerekli değilse ve katılımcılardan (veya katılımcı yetkin değilse ebeveynlerinden veya velilerinden) basılması için yazılı onam alınmadıysa, katılımcılara ait detaylar (isimleri, doğum günleri, kimlik numaraları ve diğer bilgileri) tanımlayıcı bilgilerini, fotoğraflarını ve genetik profillerini içerecek şekilde yazılı formda basılmamalıdır. Tam gizlilik sağlanmasının zor olduğu durumlarda, bilgilendirilmiş onam formu şüpheyi içerecek şekilde düzenlenmelidir. Örneğin fotoğrafta katılımcıların göz kısmının maskelenmesi gizlilik açısından yeterli olmayabilir. Eğer karakteristik özellikler gizlilik açısından değiştirilirse, örneğin genetik profilde, yazar yapılan değişikliğin bilimsel olarak sorun oluşturmadığından emin olmalıdır.

Aşağıdaki ifade belirtilmelidir:

Bilgilendirilmiş Onam: "Çalışmadaki tüm katılımcılardan bilgilendirilmiş onam alınmıştır."

Eğer makalede katılımcıların tanımlayıcı bilgileri yer alacaksa, aşağıdaki ifade belirtilmelidir:

"Makalede kişisel bilgileri kullanılan tüm katılımcılardan ayrıca bilgilendirilmiş onam alınmıştır."

DEĞERLENDİRME SÜRECİ

Türk Kolon ve Rektum Hastalıkları Dergisi'ne gönderilen tüm yazılar, sisteme yüklendikten sonra ilk önce editöryal kurul tarafından derginin amaç ve hedeflerine uygunluk ve temel şartları sağlama yönünden değerlendirilecektir. Yazılar, konusunda uzman dergi hakemlerine değerlendirilmek üzere gönderilecektir. Tüm kabul edilen yazılar yayımlanmadan önce, istatistik ve İngiliz dili konusunda uzman editörler tarafından değerlendirilecektir. Sayfaların ilk gözden geçirilmesinden sonra, hakem yorumları ön karar vermek için Editör'e gönderilecektir. Bu aşamada, ilk değerlendirmede bulunanların düşüncesi doğrultusunda, yazı kabul edilebilir, reddedilebilir veya yazıda düzeltme yapılması istenebilir. İlk değerlendirme sonrasında değerli bulunan makaleler için genellikle düzeltme istenir. Düzeltilen makaleler ilk karardan sonraki 2 ay içerisinde tekrar dergiye gönderilmelidir. Süre uzatmaları yardımcı editörden 2 aylık süre bitmeden en az 2 hafta önce talep edilmelidir. Türk Kolon ve Rektum Hastalıkları Dergisi tarafından, 2 aylık düzeltme süresi sona erdikten sonra, yazı kabul edilmeyecektir. Düzeltme yapılan yazılar sisteme tekrar yüklendikten sonra değerlendirilmek üzere (genellikle ilk değerlendirmeyi yapan hakeme) gönderilecektir. Sonuç olarak yayımlanma kararı verildikten sonra, baskı öncesi Teknik Editör tarafından son kez değerlendirilecektir ve iletişim kurulacak olan yazara gözden geçirme ve son düzenlemeleri yapmak üzere işaretlenmiş bir nüshası elektronik ortamda gönderilecektir.

DÜZELTME SONRASI GÖNDERİLMESİ

Revize edilmiş bir versiyonu gönderirken yazar, yorumcular tarafından ele alınan her konuyu ayrıntılı olarak açıklamalı ve nokta nokta ayrıntılı olarak "yorumlara yanıt" sunmalıdır ve ardından belgenin açıklamalı kopyası bulunmalıdır (her yorumcunun yorumu nerede bulunabilir, yazarın cevap ve satır numaraları gibi yapılan değişiklikler).

Bunun yanı sıra ana revize yazı, kabul mektubu tarihinden itibaren 30 gün içinde teslim edilmelidir. Yazının revize edilmiş versiyonunun tanınan süre içinde verilmemesi durumunda, revizyon seçeneği iptal edilebilir. Yazar(lar) ek sürenin gerekli olduğunu düşünüyorsa, ilk 30 günlük süre bitmeden, uzatmayı talep etmelidir.

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Tüm yazılar yayımlanmadan önce profesyonel olarak "English Language Editor" tarafından değerlendirilmektedir.

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Kabul edilmiş yazının baskı için tümü hazırlanırken online olarak özet hali yayımlanır. Kabul edilen yazı kontrolden geçtikten sonra, yazarlar son düzeltmeleri yaptıktan sonra ve tüm değişiklikler yapıldıktan sonra yazı online olarak yayımlanacaktır. Bu aşamada yazıya DOI (Digital Object Identifier) numarası verilecektir. Her iki forma da www.journalagent.com/krhd adresinden ulaşılabilecektir. Kabul edilen yazının yazarları elektronik ortamdaki sayfaları çıktı olarak aldıktan sonra proofreading yapmak, tüm yazıyı, tabloları, şekilleri ve kaynakları kontrol etmekle sorumludur. Baskıda gecikme olmaması için 48 saat içinde sayfa kontrolleri yapılmış olmalıdır.

YAZIŞMA

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Turkish Journal of
COLORECTAL DISEASE

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Case Reports/Olgu Sunumları

Turkish Journal of
COLORECTAL DISEASE

Editorial/Editöryal

Esteemed colleagues,

When the weather changes to spring freshness, we are quite proud to be present a new issue of TJCD. This year will be a very busy year in terms of TJCD. As we all know, In April, We will organize the 17th Congress of the Turkish Colon and Rectum Surgery, which has now become an internationally prestigious congress. In the congress, very valuable and well-known scientists from many countries with international reputation, will give us a real feast of science.

Besides that, The most prominent academicians of our country who are devoted theirself for Colon and Rectum Diseases will share their experiences. So 9-13 April will be the days we will renew ourselves. Our congress will be held at the Regnum Carya Hotel this year which was preferred and admired before. I suggest you not to miss this worthwhile opportunity. On the other hand, the Maturation period of Turkish Journal of Colorectal Disease has done as regenerating seriously in recent years and re-emerging on the basis of its strong history. Our strategy will be to reach as many people as possible. As of the moment, Our journal, which has regular followers from all over the world, will reach more people.

In addition to this, we are proceeding to take a place in worlwide indexes. We are going to achieve our aim being in all of the essential indexes, in a short time.

We have included articles that you will enjoy quite a bit in this issue. There is a very interesting article in which laparoscopic approach in advanced colorectal cancers is combined with conventional approach, and therefore the duration of symptons in anal fissure has an impact on the success of Botulinum Toxin treatment? You will read a current review that answers this question.

Additionally, we have included a clinical research that is received from the easternmost of Turkey.

You will read an article that examines the factors affecting the mortality of Fournier's gangrene, where the whole world is worried and we have a strong voice in the country.

Stoma is a condition that negatively affects morale and motivation. Can motivation be strengthened with support groups in this regard? We hope you will read this review on this subject with zeal.

In addition, interesting case reports have been presented in this issue.

Hope to meet you in the next issue..

Tahsin Çolak, MD
Surgery Professor and Editor-in-Chief

Değerli meslektaşlarım,

Havaların ilkbahar ferahlığına dönüştüğü bu günlerde yeni bir sayı ile karşınızda olmaktan gururluyuz. Bu yıl TKRCD açısından oldukça yoğun bir yıl olacak. Hepinizin bildiği gibi Nisan ayında, artık uluslararası prestijli bir kongreye dönüşen 17. Türk Kolon ve Rektum Cerrahisi Kongresi'ni düzenleyeceğiz. Kongrede hepimizin çok yakından tanıdığı ve uluslar arası üne sahip birçok ülkeden çok değerli bilim insanları bize gerçek anlamda bir bilim ziyafeti çekecekler. Bunun yanında ülkemizin en önde gelen Kolon ve Rektum Hastalıkları'na gönül vermiş bir çok hocamız kendi deneyimlerini aktaracaklar. Yani 9-13 Nisan tarihleri kendimizi yenileyeceğimiz günler olacak. Bu yıl da kongremiz daha önce çok beğenilen Regnum Karya Oteli'nde yapılacaktır. Bu güzel fırsatı kaçırmamanızı tavsiye ederim.

Bununla birlikte geçmişten gelen fakat son yıllarda ciddi yenilenme yaşayan ve güçlü geçmişine dayanarak yeniden ayaklanan Türk Kolon ve Rektum Hastalıkları Dergisi'nin olgunlaşma dönemi bitti. Bundan sonraki stratejimiz olabildiğince çok insana ulaşmak olacaktır. An itibarıyla dünyanın dört bir yanından düzenli olarak takipçileri olan dergimizin daha çok insana ulaştırmak kısa vadeli hedefimiz olacaktır.

Bununla birlikte en yaygın kullanılan indekslerde yerimizi almaya devam ediyoruz. Kısa bir süre içinde temel indekslerin tümünde yer alma hedefimize ulaşacağız.

Bu sayıda oldukça keyif alacağınız makalelere yer verdik. İleri evre kolorektal kanserlerde laparoskopik yaklaşım ile konvansiyonel yaklaşımın bir arada sunulduğu oldukça ilginç bir makaleye ve bununla birlikte anal fissürdeki semptom süresinin Botulinum Toksin tedavisinin başarısında etkisi var mı? Bu soruya cevap veren güncel bir değerlendirme okuyacaksınız.

Bu ilginç makalelerin yanında Türkiye'nin en doğusundan gelen bir klinik araştırmaya da yer verdik.

Bütün dünyanın endişe ettiği ve ülke olarak yönetiminde oldukça söz sahibi olduğumuz Fournier gangreninin mortalitesinde etkili faktörleri irdeleyen bir makale okuyacaksınız.

Stoma moral ve motivasyonu negatif etkileyen bir durum. Bu konuda hastalara destek grupları ile motivasyon güçlendirilebilir mi? Bu konuda yazılmış bu derlemeyi ilgiyle okuyacağınızı umarız.

Ek olarak bu sayıda da ilginç olgu sunumlarına yer verildi.

Bir dahaki sayıda buluşmak dileğiyle…

Prof Dr Tahsin Çolak
Cerrah Profesörü ve Baş-Editör

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REVIEW

Should Support Group Intervention be Implemented for Individuals with Stoma?

Stomalı Bireylerde Destek Grup Girişimi Yapılmalı mı?

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ABSTRACT

The presence of stoma in individuals causes physical, psychological and social problems. For this reason, individuals with stoma need effective psychosocial interventions in order to adapt to the stoma. One of these effective psychosocial interventions is support groups. Support groups are defined as groups of individuals with the same problem that provide common support through interpersonal relationships. Individuals generally need to join these groups when natural social support networks are inadequate or if their psychosocial needs are not met. Sharing experiences with other group members in the support group intervention creates positive effects, and solutions are developed for problems with participation in the group. In many studies carried out with other patient groups, support group intervention has positive effects and individuals improve their quality of life. In our country, there is no ongoing support group intervention for individuals with stoma, but in order to help develop psychosocial adaptation to stoma and its effects, nurses should raise awareness about the need for support group intervention and implement these interventions.
Keywords: Stoma, support groups, nursing

ÖZ

Bireylerde stomaların varlığı fiziksel, psikolojik ve sosyal yönden sorunlara neden olmaktadır. Bu nedenle stomalı bireyler stomaya uyum sağlayabilmek için etkili psikososyal girişimlere gereksinim duyarlar. Bu etkili psikososyal girişimlerden birisi de destek gruplarıdır. Destek gruplar, kişiler arası ilişkiler yolu ile ortak destek sağlayan, aynı soruna sahip bireylerin oluşturduğu gruplar olarak tanımlanmaktadırlar. Bireyler genelde, doğal sosyal destek ağları yetersiz olduğunda ya da psikososyal gereksinimleri karşılanamadığında bu gruplara katılmaya ihtiyaç duyarlar. Destek grup girişiminde diğer grup üyeleri ile deneyimlerin paylaşılması olumlu etkiler yaratmakta, gruba katılım ile yaşanan sorunlara yönelik çözüm yolları geliştirilmektedir. Diğer hasta gruplarıyla yapılan pek çok çalışmada destek grup girişimin olumlu etkileri olduğu, bireylerin yaşam kalitesini yükselttiği bildirilmektedir. Ülkemizde stomalı bireylere yönelik devam eden bir destek grup girişimi bulunmamaktadır, ancak stomalı bireyler için stoma ve etkilerine yönelik psikososyal uyumun gelişmesine yardım edebilmek için hemşireler destek grup girişiminin gerekliliği konusunda farkındalık yaratmalı ve bu girişimleri uygulamalıdır.
Anahtar Kelimeler: Stoma, destek grupları, hemşirelik

Introduction

According to Globocan 2012 data published by International Cancer Agency; colorectal cancer (CRC) is the second most common type of cancer in men in the world and the third most common form of cancer in women. According to the 2014 data of the Ministry of Health, CRCs are third in both women and men in our country. The prevalence is 22.8 per hundred thousand in men and 13.8 per hundred thousand in women.[1] In the treatment of CRC, surgical treatment, chemotherapy or radiotherapy, alternatively adjuvant therapy can be applied, and most of the patients are exposed to stoma during surgery.[2] Although stoma opening is a surgical procedure commonly used in the treatment of CRC, it is also used in the surgical treatment of inflammatory bowel diseases and traumas.[3]

Presented in: This study was presented by verbal announcement in 16th National Colon and Rectal Surgery Congress (17-30 May 2017, Antalya).
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Although stoma indications vary, stoma opening causes lifestyle changes due to loss of fecal control and dependence on bag, causing individuals to experience various physiological, social and psychological problems and adversely affect quality of life.[4,5,6] Anxiety, change of body image, self-esteem and loss of self-esteem, loss of attractiveness, deterioration of sexual function, fecal leakage, fear of sound/smell and depression are frequently seen problems.[5,7,8] Because of these problems, individuals tend to restrict themselves and abolish themselves from society. Family relations, work experiences, social and sexual life of individuals are affected negatively. They think that their family and their immediate surroundings are distancing themselves and restrict their interpersonal relations. In individuals, job drop and job efficiency after stoma opening is frequently observed.[4,5,6] Individuals with stomata are ashamed of thinking that they are disturbing others in social environments with uncontrolled defecations. Accordingly, they isolate themselves from the society and are introverted.[9,10] Studies have shown that the loss of control over gas and fecal output after stoma opening causes psychological and social isolation in individuals, and that stoma creates negative emotions affecting individuals, interpersonal relationships and body image. It is reported that it cannot carry out leisure activities such as sports and it affects the quality of life negatively.[11,12]

Since most individuals with stomata also fight with cancer, only medical treatment protocols such as chemotherapy, radiotherapy and surgical treatment are not sufficient on the way to recovery. The main treatment criteria are to ensure and maintain the psycho-social comfort of the individual during and after the treatment and recovery period. One of the most important means of providing this is social support. The scope of social support usually consists of family members, close relatives, friends and health care teams (physicians, nurses, social workers, psychologists, etc). Support groups are one of the most important tools that meet social support needs.[13] These groups play an important role on the social cohesion of individuals.[7] Social cohesion is that individuals learn to abide by the rules of the society they live in, and develop a behavior that is appropriate to these rules and value judgments. The stages of acquiring the values, behaviors and knowledge of the society in which individuals belong are the process of socialization. This socialization process can affect the family, heredity, whether the individual's health status affects the activities of daily living and affect the peer group.[14] Nursing interventions aimed at restoring the social cohesion of individuals; psychological support, psychotherapy, social support, inclusion of individuals in other stoma individuals and activating individuals.[15] Creating support groups by bringing people with stoma together with other people with stoma, sharing feelings, thoughts and problems in these groups, realizing that individuals are not alone, sharing solution suggestions for problems and increasing social support facilitate the social cohesion of individuals.[14] In this review, it is aimed to emphasize the effects of support group initiatives, one of the counseling roles of nurses, on stoma individuals.

Support Group Intervention

Definition, Purpose and Importance of Support Group Intervention

Support group initiative; is a planned and systematic aid process designed for individuals with similar problems or needs by a professional consultant to adapt to daily life and to deal with the problems they face.[14] Support groups are the groups that provide individuals to share their knowledge, experience and problems in a safe environment and provide support from people with similar diseases.[16,17] Support groups have five general objectives defined; the support group should empower individuals to cope with their coping skills, provide common points to talk, and share experience and situation sharing, to help the group members to overcome the current problem, to explore knowledge sharing, problem solving strategies, and to evaluate the advantages and disadvantages of various coping methods. The two aims of the support group are particularly important for stoma individuals; information sharing and encouraging individuals. Information sharing is very important because there are various and different skills that enable the successful management of the newly opened stoma within the group. It provides a rich resource for learning the experiences, ideas and attitudes of other individuals in the group.[18] Support groups allow individuals to realize that they are not alone, to overcome illness and to confront, to provide stress relief to individuals. It gives basic knowledge and skills for social cohesion. With experience sharing, individuals share their feelings and thoughts, and suggestions for problem solving. Support groups provide individuals with the opportunity to assess their own behavior and the problems of others and to develop solutions for solutions, with the support of others, to participate in plans that lead to cognitive and behavioral change. Each member of the group forms a model for learning the appropriate behavior, and the individual learns to help others in the process of helping others.[16]

Structure and Operation of Support Group

Initiative support groups are classified into three groups[16];

- Online,
- Guided by professional leaders such as nurses, psychologists, social workers,

- Peer leaders (self help). The most important element that provides support to the support groups is the leader.

It is important that the group leader is sensitive, flexible, and natural, so that the members can correctly identify their features and needs. The leader should ensure group harmony, provide accurate and consistent information, be effective in establishing sincerity as well as natural and open communication among group members. The leader takes part as a facilitator in the group. It sets the objectives of the group by evaluating the needs of the group members.[13] When creating support groups, it is recommended to pay attention to the fact that the number of participating members is at least three and at most fifteen.[16] It is important that the number of sessions, duration of the group, how many weeks the group will last, the number of members to be determined in advance and the status of the group members in determining these.[13] In the studies, it is seen that the group sessions are done every week, biweekly and monthly.[19,20,21] Group sessions can be performed during the diagnosis, treatment, recovery or palliative care.[13] More than one person cannot speak at the same time within the group. For this reason, the group leader should remind the members that they must first listen to each other and promise to everyone. The group leader should pay attention to the fact that group meetings lasting more than two hours create a vicious cycle, are repetitive and ineffective, and the meetings are within an average 80-90 minutes period for an effective support group initiative.[16]

International Online Support Groups for Stoma Individuals

There are many online support group organizations in the world for people with stoma. The Australian Council of Stoma Association, the Federation of Nz Ostomy Societies, the United Ostomy Associations of America, the Ostomy Canada Society, and the Colostomy Association (Figure 1). These organizations allow individuals with stomata in the same situation to talk to each other, share their experiences and feelings, and guide each other through the Internet.

Support Group Intervention for Stoma Individuals in Turkey and in the World

It organizes many different support group meetings with individuals with stoma in many parts of the world. For example; stoma support group meetings are held every month at Northwest Community Hospital. In group meetings, speakers, company presentations, group support and stoma nurses provide answers to the questions of individuals.[22] In support group meetings at Aga Khan University in Nairobi, individuals discuss issues such as group rules, information and acceptability. They distribute the stoma materials they pack together before the meeting. Some of the group members who have been trained and

Australian Council of Stoma Association (ACSA)	https://australianstoma.com.au/
Federation of Nz Ostomy Societies (FNZOS)	http://www.ostomy.org.nz/
United Ostomy Associations of America (UOAA)	https://www.ostomy.org/
Ostomy Canada Society	https://www.ostomycanada.ca/
Colostomy Association	http://www.colostomyuk.org/

Figure 1. International online support group organizations

gained skills in a program help home users by opening a new stoma.[23] Social meetings are held every two weeks in the form of morning coffee with the stoma support group called "inside out" at St Marks Hospital. Individuals attending the meeting meet with individuals with similar problems, share suggestions and have fun time.[24] In our country, since 2000, patients who have opened stoma have been given care, training and consultancy services in nursing units by trained nurses. However, there are no support groups in our country where stoma individuals continue. In the literature, no support group work for stoma individuals could be reached. In a study conducted with individuals with stoma in our country, weekly meetings were organized using planned group interaction. The meetings continued for six weeks and each meeting lasted 90 minutes on average.

In the meetings, methods such as presentation by using computer and projection, using stoma care materials, group discussion around the round table, letter writing about the participants' stoma and reading the letters in group session were used. As a result of the study, it has been reported that planned group interaction increases the social cohesion of individuals with stoma.[14]

In the literature, there are other studies in which support group intervention is applied in other patient groups. As a result of a study in which support group intervention was applied to individuals with CRC, support group intervention was reported to increase the quality of life of individuals.[25] In a study conducted with liver transplantation individuals, support group meetings were organized monthly and meetings were held on average for 90 minutes and a total of six meetings were held. In the meetings, information about the meeting subject was shared with the booklet prepared in advance. As a result of the research, it is reported that support group initiative is effective in increasing the level of knowledge of individuals and decreasing the symptoms of individuals, supporting the adaptation of individuals and improving the quality of life.[19] In a randomized controlled trial, women with early stage breast cancer were divided into three groups. One hundred twenty-five women were given support group and training initiative based on Roy Adaptation Model. In the experimental group, 34 women received support group training in three stages and phone call for 13 months. In the first control group, 48 women received social support and training in three steps. In the second control group, 43 women received training only once by mail. As a result of the study, the experimental group and the first control group reported that they experienced less discomfort, less loneliness, and higher quality relationships than the second control group.[21]

Result

In order to cope with the psychosocial problems experienced by individuals with stoma and to ensure the social cohesion of individuals, stoma care nurses have important responsibilities. The responsibilities of the nurses include; to provide psychosocial support to the patients as well as their physical and to increase their adaptation to the disease. The nursing roles of the stoma individual for social cohesion are; to provide individual training and consultancy services, to support the individual to realize and use his/her own social support factors in his/her environment and to strengthen the support by meeting with his/her family and his/her relatives. In this regard, it is important to create support groups by bringing together individuals with stoma with other people with stoma. In our country, there is no continuous stomaterapy program or support group initiative. For this reason, it is recommended to plan, implement and increase the support group meetings where stoma individuals can share their problems in order to ensure social cohesion, ask questions, get information and benefit from each other's experiences.

Ethics

Peer-review: Internally peer-reviewed.

Authoring Contributions

Concept: S.S., F.V., Design: S.S., F.V., Data Collection or Processing: S.S., F.V., Analysis or Interpretation: S.S., F.V., Literature Search: S.S., F.V., Written by: S.S., F.V.

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REVIEW

Robotic Ventral Mesh Rectopexy: Where do we Stand?

Robotik Ventral Meş Rektopeksi: Güncel Olarak Neredeyiz?

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ABSTRACT

This paper aims to review the current status of robotic ventral mesh rectopexy (VMR). The articles reporting the outcomes of patients who underwent robotic VMR were reviewed and evaluated. Complications of robotic VMR ranged between 0% to 25%, the majority of them were minor complications. Longer operating time and higher hospital expenses are the major limitations of robotic surgery compared to laparoscopy. As an emerging technique, robotic VMR promises good outcomes. Robotic VMR seems to be a safe and effective surgical technique in the treatment of rectal prolapse.

Keywords: Robotic, rectopexy, ventral mesh repair

ÖZ

Bu makalede robotik ventral meş rektopeksi (VMR) operasyonunun güncel tekniği ve sonuçları gözden geçirilmiştir. Robotik VMR ile ilişkili komplikasyonlar %0 ile %25 arasında değişen ve çoğunluğu minimal komplikasyonlardır. Daha uzun ameliyat süresi ve daha yüksek hastane maliyeti, laparoskopiye kıyasla robotik cerrahinin en önemli kısıtlamalarıdır. Gelişen bir teknik olarak, robotik VMR iyi sonuçlar vaat etmekte ve rektal prolapsus tedavisinde etkili bir cerrahi teknik olarak görünmektedir.

Anahtar Kelimeler: Robotik, rektopeksi, ventral meş onarım

Introduction

Rectal prolapse and related conditions such as rectocele and enterocele are socially debilitating conditions.[1,2] Among many effective surgical and medical treatment options defined, there is no standard treatment for rectal prolapse. Proper management of rectal prolapse should be tailored individually based on presence of pelvic floor defects, vaginal prolapse, severe constipation, prior perineal trauma and surgical history.[3,4] Similar to many other disorders of the pelvic floor, multidisciplinary approach is required for treatment of rectal prolapse.[4] Surgical treatment of rectal prolapse has evolved substantially after the introduction of laparoscopy.[5] Currently, laparoscopic ventral mesh rectopexy (VMR) is the main surgical treatment of choice for rectal prolapse. The original procedure, described by D'Hoore et al.[6], involves re-placing of the prolapsed rectum by suspending it to the anterior longitudinal ligament of the sacrum using a mesh anteriorly. Laparoscopic VMR improves the symptoms of obstructed defecation by fixing the rectal prolapse without creation of an anastomosis.[7,8] However, laparoscopic technique has some limitations while working in confined spaces such as deep pelvis, intracorporeal suturing and positioning the mesh.[9] Robotics, which has been developed to overcome limitations of laparoscopy, provides better visualization and increased maneuverability in confined spaces and complicated conditions.[10] This paper aims to review the current status of the robots in VMR for the treatment of rectal prolapse.

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Review Content

Articles reporting the outcomes of patients who underwent robotic VMR were extracted. The extracted articles were reviewed in terms of operation times, presence of conversion to conventional laparoscopy or open surgery, postoperative complications, length of hospital stay, long-term functional results, recurrences, and costs.

Perioperative Course

Mechanical bowel preparation is used preoperatively in all patients. For deep vein thrombosis prophylaxis, compression stockings and low molecular weight heparin (before and after 12 hours of surgery) are used. After induction of anesthesia, an orogastric tube is inserted and it is removed before extubation, following completion of the surgical operation. Patient is positioned in a modified lithotomy position. The arms are tucked and the body is stabilized with the pads around the shoulders. The *da-Vinci Xi*® platform is used in our operations, exclusively. After routine cleaning with povidone-iodine, the ports are placed in a straight-line 8 cm apart horizontally. An 8 mm accessory port with air seal may be placed in the right lower quadrant in complicated cases. The robot is docked at a 30-degree angle along the left side. The key steps of the procedure were identification of the promontorium, creation of the peritoneal flaps, dissection of the recto-vaginal/vesical septum down to the pelvic floor, mesh placement and closure of the peritoneal flaps. We previously published our operative technique in details.[11] Patient-controlled analgesia is used for all patients. Patients are asked to walk and to perform breathing exercises within the first postoperative day. Oral feeding is also started in postoperative day 1. The urinary catheter is removed one day after surgery. Discharge criteria include tolerance of meals without nausea or vomiting, established bowel function, adequate pain management with oral analgesia and independent walk.

Discussion

Laparoscopic VMR has gained popularity for the surgical treatment of rectal prolapse since it was first described.[9,12] Many studies have reported the safety of this procedure and good functional results with acceptable complication rates post-operatively.[7] However, two-dimensional imaging, limited mobility of laparoscopic instruments and working in a confined space such as pelvis are the factors that increase the complexity of VMR when performed laparoscopically.[9] Due to those factors, the learning curve of laparoscopic VMR is remarkably long and lack of experience has been shown to be associated with worse outcomes.[9,13] It has been reported that the number of cases needed to be performed to gain dexterity for providing clinically good quality of life was in between 82 and 105 cases and for standardizing the operating time was around 54 cases.[13] Considering all the advantages of the robotic platform including better visualization and increased maneuverability in confined spaces and complicated conditions, VMR seems as an ideal procedure for robotic technique.[9] Taking into account its technical advantages, the learning curve of robotic VMR also may be shorter (18 cases) compared to laparoscopy.[9,14] Thus, VMR is being increasingly performed with robotic technique.[2,7,15,16]

Complications

After the adoption of laparoscopic surgery, the complication rates of rectopexy significantly reduced.[17] Overall complication rates were between 0 and 23.5% after laparoscopic VMR, major complication rates ranged from 0 to 7.7%, and perioperative mortality was reported to occur between 0 and 1.1%.[7] Similarly, complications of robotic VMR ranged from 0% to 25%, and the majority of them were minor complications.[14,16,18,19,20,21,22,23,24] The largest series of robotic VMR reported a 1.9% intraoperative complication rate, and 1.9% and 7.0% major and minor early postoperative complication rates, respectively. The mortality rate was found to be 0.4%. In this study, late major and minor complications were seen in 3.5% and 7.1% of the patients, respectively.[2]

Intraoperative complications of minimally invasive VMR were vaginal perforation, rectum perforation and hemorrhage.[2,18,25] Postoperative complications were wound hematoma, surgical site infection, subcutaneous emphysema, urinary retention, urinary tract infections, ileus, mesh erosion, fistula formation, sacral discitis and incisional hernia.[9,24,25,26,27,28] The studies reporting the outcomes of robotic VMR were summarized in Table 1.

In a meta-analysis comparing robotic and laparoscopic VMR, reviewing 242 patients, robotic surgery was shown to have less operative morbidity.[29] Another meta-analysis that reviewed 3 studies for early complications of robotic and laparoscopic VMR reported fewer wound complications, urinary tract infection, postoperative ileus and abdominal pain in the robotic group, but those trends were not statistically significant.[26] Male sex and history of having previous abdominal surgeries were the risk factors associated with operative morbidity in patients undergoing VMR.[9] Dyspareunia and recto-vaginal fistula are common mesh related complications related to VMR.[7,30] A study conducted by Evans et al.[31] including 2203 patients reported 2% general mesh erosion in a median time of 23 months after laparoscopic VMR. In other studies, mesh related complications were reported between 0 and 6.7%.[7]

Table 1. Main outcomes of robotic ventral mesh rectopexy

Study	Operation	No of operations	Follow-up time (median)	Complications	Recurrence	Efficiency
de Hoog et al.[32]	RR vs LR vs OR. Wells or VMR	14 robot-19 lapaproscopy (1 conversion)	Short term	Robot 2 postop constipation-laparoscopy 3 postop constipation	N/A	N/A
Wong et al.[38]	RVMR or LVMR	15 robot-23 laparoscopy-3 laparotomy	12 months	2 recurrence	2 patients (7-3 months)	ODS score >6 achieved a significant improvement in postoperative scores
Wong et al.[16]	RVMR or LVMR	19 robot-41 laparoscopy-3 laparotomy	6 months	2 ileus (laparotomy)-3 UTI	None	N/A
Abet et al.[27]	RVMR or LVMR	15 robot-23 laparoscopy-3 laparotomy	7 months	3 UTI-1 Urinary retention	None	Better sexual comfort
Perrenot et al.[14] (2002-2006 17 patients delorme.)	Robotic assisted laparoscopy	72 robot-5 laparotomy (16 ventral-52 alateral-9 sigmoid res)	52.5 months	3 rectal wound-2 urinary infection-2 presacral collection-1 hemorrhage	9 patients-> 5 resurgery->3 second recurrence (1 ventral rectopexy recurrence)	Statistics N/A
Mäkelä-kaikkonen et al.[18]	RVMR-LVMR	20 robot-20 laparoscopy	3 months	1 vaginal perforation (robot complications) -1 UTI	None	Subjective benefit (%80)
Mantoo et al.[34]	RVMR	50 robot-1 laparotomy	14 months	3 UTI-3 recurrence	3 patients	N/A
Mantoo et al.[19]	RVMR	44 robot (1 conversion) vs 74 laparoscopy (3 conversion)	16 months	4 UTI-2 Ileus	3 patients	ODS-CCF scores increased, sexual improvement
Mehmood et al.[20]	RVMR-LVMR	17 robot-34 laparoscopy (1 conversion)	12 months	None in robot-hematoma, infection, ileus, confusion, UTI, readmission with abdominal pain in lap	None	Wexner postop score better in both-robot better QOL
Mäkelä-Kaikkonen et al.[33]	RVMR-LVMR	16 robot-14 laparoscopy	3 months	Robot- fever, hematoma of rectus Laparoscopy-perineal pain	None	Reduction of prolapses in MR defecography
Faucheron et al.[21]	RVMR-LVMR	10 robot-10 laparoscopy	1 month	None	None	N/A
van Iersel et al.[7]	RVMR	51 robot (1 conversion)	12.5 months	Constipation 3- UTI-hematoma-abscess of proximal bladder-Hypokalemia (early) ACNES 2- Perforating vaginal suture- 2 UTI (late) . Erosion of mesh (1)	1 distal rectocele-1 asymptomatic cystocele	Anatomical, functional increase Pescatori, Wexner, Vaizey, QOL better scores, better sexual health

RR: Robotic rectopexy, LR: Laparoscopic rectopexy, OR: Open rectopexy, VMR: Ventral mesh rectopexy, LVMR: Laparoscopic ventral mesh rectopexy, RVMR: Robotic ventral mesh rectopexy, N/A: Not applicable, ODS: Obstructed defecation score, UTI: Urinary tract infection, ACNES: Anterior Cutaneous Nerve Entrapment syndrome, QOL: Quality of life, MR: Magnetic resonance

After robotic VMR, to our knowledge, only one case of mesh erosion was stated in a study of 258 patients after a mean time of 23.5 months.[2] However, larger studies with longer follow-up are needed to evaluate postoperative complications after robotic VMR.

Operation Time

The operation times were significantly longer in robotic VMR compared to laparoscopy in all clinical studies and two meta-analyses, except 2 of them showing no differences.[15,16,18,19,20,21,26,29,32,33] While robotic VMR seems disadvantageous when compared to laparoscopic VMR due to prolonged operation time, operative experience and standardization of the surgical technique may reduce duration of surgery.[34] Long operation time in the robotic VMR was not associated with increased risk of postoperative morbidity in any of the prior studies.

Conversion to Open Surgery

Conversion to open surgery from laparoscopic VMR was reported between 0-10%.[7,16] Majority of conversions were due to extensive intra-abdominal adhesions.[7] Up until now, no differences were reported so far in any of the clinical trials or in either of the two meta-analyses comparing laparoscopic and robotic VMR in terms of conversion to open surgery.[15,16,18,19,26,29,33]

Length of Hospital Stay

The length of hospital stay was generally reported as similar after laparoscopic and robotic VMR.[15,16,18,19,20] Only in the study by de Hoog et al.,[32] the length of hospital stay after robotic VMR was significantly shorter than the laparoscopy and the open surgery group. While a meta-analysis conducted by Ramage et al.[26] showed no differences in terms of length of stay (LOS) between laparoscopic and robotic VMRs, other meta-analysis conducted by Rondelli et al.[29] showed shorter LOS after robotic VMR.

Cost

There are only two studies comparing the costs of laparoscopic and robotic VMR.[15,21] In both of these studies, the robotic procedures were associated with higher costs. Heemserk et al. reported that costs were 557.29 Euros (or: 745.09 dollars) higher in robotic surgery when compared to laparoscopy.[15] Faucheron et al[21] reported that robotic rectopexy was associated with 5359 Euros additional cost per procedure (9088 vs 3729 euros per procedure, $p<0.001$) compared to laparoscopic VMR.[21] As seen from these trials and considering the expense of the dock console and devices, and also the longer occupation time of the operating room, robotic technique is apparently more expensive in the short term. However, a long-term analysis for cost-effectiveness of robotic and laparoscopic VMR is still lacking.

Long Term Outcomes: Functional Results and Recurrence

The purpose of rectal prolapse surgery is to correct the prolapse together with its consecutive functional impairments and to protect or restore fecal continence, without causing a new onset or worsened constipation.[6] VMR, which avoids full rectal mobilization and transection of the lateral stalks, and thus limits the autonomic nerve damage, was developed in the search to reduce postoperative constipation.[6] As compared with other techniques, meta-analyses confirmed that VMR was associated with less constipation postoperatively.[7,35,36] Also, the laparoscopic VMR procedure was demonstrated to decrease obstructed defecation (52-84.2%) and incontinence (50-93%).[7]

After the introduction of robotic surgery, a number of studies reported their functional results of robotic VMR, both for prolapse and rectocele.[2,19,20,27,32,37,38,39] van Iersel et al.[2] reported a significant overall improvement in obstructive defecation (78.6%) and fecal incontinence (63.7%) in 258 consecutive patients with rectal prolapse. Other studies also showed an improvement in obstructive defecation symptoms[19,38,39], fecal incontinence[19,20,37], and sexual function[27,28,39] following robotic VMR.

While two clinical studies comparing the outcomes of robotic and laparoscopic VMR found no difference regarding anorectal functions[32,39], two other papers reported advantages of robotic VMR over laparoscopic VMR such as significant improvement in obstructed defecation[19], fecal incontinence and emotional status[20].

As an important indicator of long-term success, recurrence of rectal prolapse following minimally invasive repair stays similar to open surgery.[7] The largest observational study of laparoscopic VMR described a 10 year recurrence rate of 8.2% for patients undergoing external rectal prolapse repair.[40] The implementation of advanced technology to prolapse surgery does not seem to have changed the recurrence rates. In the studies comparing the two techniques of VMR, recurrences are reported to be from 0 to 7% for the robotic and 0 to 8% for the laparoscopic procedures, and were comparable to observational laparoscopic VMR studies.[7] A meta-analysis reviewing 5 studies and 307 patients, and another reviewing 4 studies and 244 patients for recurrence found no significant differences in the recurrence of rectal prolapse between robotic and laparoscopic VMR.[26,29] However, the follow-up periods of these clinical studies comparing the two procedures are relatively short. The only study that observed the long-term results (52.5 months of mean follow-up time) of robotic VMR reported a recurrence rate of 12.8%.[14]

Conclusions

While robotic VMR seems as a safe and effective surgical technique for treatment of rectal prolapse, data about long term outcomes are needed to reveal its role for treatment of rectal prolapse.

Ethics

Peer-review: Internally peer-reviewed.

Authorship Contributions

Concept: B.O.B., E.A., E.E., V.Ö., B.B., İ.H., T.K., Design: B.O.B., E.A., E.E., V.Ö., B.B., İ.H., T.K., Data Collection or Processing: B.O.B., E.A., E.E., V.Ö., B.B., İ.H., T.K., Analysis or Interpretation: B.O.B., E.A., E.E., V.Ö., B.B., İ.H., T.K., Literature Search: B.O.B., E.A., E.E., V.Ö., B.B., İ.H., T.K., Writing: B.O.B., E.A., E.E., V.Ö., B.B., İ.H., T.K.

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RESEARCH ARTICLE

Four Determinative Factors in Fournier's Gangrene Mortality

Fournier Gangreni Mortalitesinde Belirleyici Dört Faktör

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ABSTRACT

Aim: We aimed to more accurately predict mortality in Fournier's gangrene (FG) by investigating factors affecting mortality such as age, extent of infection, presence of accompanying comorbidities, the intensive care unit (ICU) length of stay (LOS).

Method: Routinely recorded data of 37 FG patients treated between February 2012-May 2018 were retrospectively evaluated. The patients were divided in two groups as the deceased group (DG) (n=10) and surviving group (SG) (n=27) and compared in terms of sex, age score (AS), dissemination score (DS), Uludağ Fournier's gangrene severity index (UFGSI) score, Fournier gangrene severity index (FGSI) score, serum urea levels, presence of diabetes and obesity, presence of comorbidities other than diabetes and obesity (COTDO), presence of diversion colostomy, number of days of vacuum-assisted closure treatment, hospital LOS, ICU LOS, and species of isolated bacteria. Associations between mortality and factors such as age, DS, COTDO, and ICU LOS were investigated in all cases.

Results: There was a significant difference between the two groups in terms of AS. DS was significantly higher in the DG than in SG. All of the patients in the DG had COTDO, while only 13 of the patients in the SG had these comorbidities, and the difference between the two groups was statistically significant. ICU LOS was significantly higher in the MG. In reciever operator characteristics curve analysis, UFGSI and FGSI had 93% specificity and 90% and 70% sensitivity, respectively. In logistic regression analysis, age, DS, COTDO, and ICU LOS were independent predictive factors associated with mortality.

Conclusion: Age, DS, COTDO, and ICU LOS showed significant differences between deceased and surviving patients, and emerged as independent predictive factors associated with mortality. As a result, these factors have been shown to be determinative factors in FG mortality.

Keywords: Fournier's gangrene, mortality, vacuum-assisted closure

ÖZ

Amaç: Fournier gangreninde (FG) mortaliteyi etkileyen yaş, enfeksiyonun yaygınlığı, eşlik eden yandaş hastalıkların varlığı, yoğun bakım gün sayısı (YBGS) faktörlerini araştırarak, mortalite öngörüsünü doğru şekilde önceden belirlemektir.

Yöntem: Şubat 2012-Mayıs 2018 arasındaki 37 FG hastasının prospektif kaydedilen verileri retrospektif değerlendirildi. Mortal (grup 1=10 hasta) ve sağkalan grup (grup 2=27 hasta) olarak iki gruba ayrılan hastalar cinsiyet, yaş skoru (YS), enfeksiyonun yayılım skoru (EYS), Uludağ Fournier gangreni şiddet indeksi (UFGSI) ve Fournier gangreni şiddet indeksi (FGSI) skorları, serum üre düzeyleri, enfeksiyon kaynağı, diyabet, obezite, diyabet ve obezite dışında yandaş hastalık (DODYH) varlığı, saptırıcı stomanın varlığı, vakum yardımlı kapama tedavisi gün sayısı, hastanede kalma gün sayısı, YBGS ve izole edilen bakteri tipleri açısından karşılaştırıldı. Tüm olguların tedavileri sırasında, mortaliteye belirgin etkilerini gözlemlediğimiz yaş, EYS, DODYH varlığı ve YBGS faktörlerinin mortalite üzerindeki etkileri incelendi.

Bulgular: YS bakımından da iki grup arasında anlamlı fark bulundu. EYS grup 1'de grup 2'den anlamlı olarak daha yüksekti. Grup 1'deki hastaların tamamında ve grup 2'dekilerin 13'ünde DODYH vardı ve iki grup arasında anlamlı fark bulduk. YBGS grup 1 hastalarda anlamlı olarak yüksekti. Alıcı işletim karakteristiği analizinde, UFGSI'nin ≥9 eşik değer için %90 duyarlılık ve %93 özgüllüğe, FGSI'nin ≥7 eşik değer için %70 duyarlılık ve %93 özgüllüğe sahip olduğunu saptadık. Lojistik regresyon analizinde, yaş, EYS, DODYH varlığı ve YBGS faktörlerinin mortaliteyle ilgili bağımsız öngörü faktörleri olduğunu bulduk.

Sonuç: Yaş, EYS, DODYH varlığı ve YBGS faktörlerinin gruplar arasında ileri derecede anlamlı farklar göstermesi ve bu faktörlerin mortaliteyle ilgili bağımsız öngörü faktörleri olması, FG'de mortalite öngörülebilirliği konusunda bu faktörlerin belirleyici olduğunu göstermektedir.

Anahtar Kelimeler: Fournier gangreni, mortalite, vakum yardımlı kapama

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Introduction

Fournier's gangrene (FG) is a suppurative bacterial infection of the anorectal, perineal, and genitourinary regions associated with high mortality and morbidity rates. It is a form of synergistic necrotizing fasciitis that causes thrombosis in subcutaneous vessels and results in gangrene in the overlying skin.[1,2,3] Delays in diagnosis and treatment increase mortality; therefore, symptoms should not be overlooked. The condition requires urgent and aggressive surgical debridement. The disease is named after Jean Alfred Fournier, a Parisian dermatologist and venereologist who presented the first case description in 1883.[1,2,4] Diabetes is the most common predisposing factor and is present in 20-70% of cases.[2,5] Chronic alcoholism is the second most common factor (25-50%). With all predisposing factors, immune resistance is impaired due to reduced cellular immunity.[1] Although FG can occur at all ages, its prevalence increases over the age of 50 years.[3,4] It is considered a disease of poverty.[1] Urogenital and anorectal infections and trauma are important in its etiology.[5] In addition to aggressive surgical debridement with effective antibiotic therapy, the basis of treatment is closing the open wounds created by debridement with skin flaps or grafts, using vacuum-assisted closure (VAC) systems to accelerating the formation of granulation tissue. Although a consensus has been reached regarding treatment of FG, the factors that determine mortality remain a subject of debate. In articles on this topic, each study group suggests different factors influencing mortality. Despite current advances in treatment, the mortality rate ranges between 3% and 45%.[1]

The aim of our study was to facilitate the accurate prediction of mortality by investigating factors that affect mortality in FG, including age, extent of infection, comorbidities, and length of stay (LOS) in intensive care. Our hypothesis was that age over 60 years, high dissemination score (DS), presence of comorbidities, and extended LOS in intensive care would increase the expected rate of mortality in patients with FG.

Materials and Methods

Ethical approval was obtained from the İstanbul Okmeydanı Training and Research Hospital Ethics Committee. Routinely recorded data from the medical files of 37 patients treated for FG between February 2012-May 2018 at the General Surgery Clinic of Okmeydanı Training and Research Hospital were retrospectively examined. Data pertaining to the 37 cases were evaluated in terms of age, sex, presence of obesity and comorbidities, etiology of infection, FG severity index (FGSI) score, Uludağ FGSI (UFGSI) score, need for stoma surgery, duration of VAC therapy, hospital LOS, intensive care LOS, mortality, and morbidity to identify factors that affect mortality in FG.

We attempted to establish more accurate prediction of mortality by particularly focusing on four factors we observed in our surgical practice to be closely associated with mortality in the cases examined in this study. Age and extent of infection are factors which have been highlighted in most previous studies and are accepted as directly associated with mortality. In terms of comorbidities, we observed diabetes and obesity in the majority of patients. Besides diabetes and obesity, we also observed greater mortality among patients with diseases such as heart failure, chronic obstructive pulmonary disease, hypertension, and various malignancies. We found it more suitable to evaluate intensive care LOS and presence of comorbidities other than diabetes and obesity (COTDO) for comorbidities.

All patients were diagnosed based on physical examination findings. For all patients, oral intake was discontinued at time of presentation to the emergency department and intravenous fluid and antibiotic treatment were initiated. At the same time, our surgical team began operative preparations major surgery. The purpose of surgical debridement is to remove all necrotic tissues, halt dissemination, and reduce systemic toxicity.[1] Surgical debridement was performed until perfused tissue was reached. Reinspections were done at 24- to 48-hour intervals to determine when repeat debridement was necessary, and continued until the infection was well controlled. Fecal diversion was done when necessary to protect the debrided area from contagion. Although there is no general consensus on colostomy, it is recommended in the presence of extensive sphincter damage or large perineal wounds.[5] The decision to conduct colostomy was made during the second debridement, when the sphincters could be better evaluated and the inflammation had substantially decreased.

Aggressive surgical debridement resulted in large tissue defects in all patients. Wound care is a key component of FG treatment due to the large tissue defects. VAC therapy has gained prominence in recent years and made significant contributions to this extremely difficult phase of the disease by accelerating wound healing with minimal skin defects.[6] All of our patients underwent VAC therapy after the completion of surgical debridement. VAC dressings were changed at intervals of 3 or 4 days. The final step in the treatment of all patients is closure of the large wound defects following the formation of granulation tissue induced by VAC therapy. In some patients, wound closure was possible with delayed primary suturing or V-Y local advancement flaps. However, split-thickness skin grafts were the most commonly used and preferred method for extensive wounds.

A total of 37 FG patients (21 males and 16 females) over the age of 30 were included in our study. Patients who underwent only VAC therapy after aggressive surgical debridement met

the inclusion criteria. Patients who were not treated with VAC after surgical debridement were excluded. These were patients with small, localized regions of involvement which were closed with cutaneous and subcutaneous primary suturing after at least two surgical debridements.

There is no reliable tool to estimate the severity of FG, but scoring systems can be used. An ideal scoring system should provide clear and effective information about the patient and also identify high complication and mortality rates.[7] Laor et al.[8] recommended the FGSI, which they created by adapting the acute physiological and chronic health evaluation (APACHE II) score for FG prognosis. They showed that the FGSI score can predict mortality rate with 75% accuracy and survival rate with 78% accuracy. The FGSI, which has attracted considerable attention in the literature, is a valid and effective scale commonly used in many studies to determine clinical outcomes of the disease. Yılmazlar et al.[9] have proposed a new scoring system by adding an age score (AS) and the DS to the FGSI. The most important feature of this scoring system, called the UFGSI, is the dissemination score.

The patients in our study were divided into the deceased (group 1, n=10) and surviving (group 2, n=27) groups. Patients in these groups were compared in terms of sex; AS, DS, UFGSI, and FGSI scores; serum urea levels; source of infection; presence of diabetes, obesity, and COTDO; the presence of a diversion stoma; VAC therapy duration, hospital LOS, and intensive care LOS; and species of bacteria isolated from culture. In addition, we evaluated associations between mortality and AS, DS, presence of COTDO, and intensive care LOS, which we observed clinically to have significant impact on mortality in our patients.

Statistical Analysis

Statistical analyses were done in SPSS for Windows version 15.0. The results were evaluated using a Mann-Whitney U test, chi-square test, receiver operating characteristic (ROC) curve analysis, and regression analysis. Differences were considered statistically significant at $p<0.05$.

Results

The mortality rate was 27% (10 patients).There was a significant sex difference between the groups (Table 1). Eight of the deceased patients were female. The mean age of the patients in our study group was 58.10±14.15 years. The mean age of the patients in group 1 (72.40±13.49) was significantly higher than that of the patients in group 2 (52.81±10.32) (Table 2). We noted a significant difference between the two groups in terms of AS, which is one of the parameters of the UFGSI (p=0.003) (Table 3). The DS, another of the UFGSI parameters, was also significantly higher in group 1 compared to group 2 (Table 3). The UFGSI and FGSI scores of the patients in group 1 were significantly higher than those of group 2 (Figures 1 and 2). Heart and respiratory rates, which are UFGSI and FGSI parameters, were significantly higher in group 1 compared to group 2, while hematocrit values were significantly lower in group 1 than in group 2 ($p<0.05$) (Table 2).

When we separately compared the groups' scores for each index, there were significant differences between the groups in body temperature, heart rate, respiratory rate, and serum potassium and bicarbonate levels ($p<0.05$) (Table 3). There was no significant difference between the groups in prevalence of diabetes mellitus (DM) or obesity (Table 1).

Table 1. Characteristics of the groups and factors associated with mortality

	Group 1 (deceased)	Group 2 (surviving)	p
Sex			
Female	8	8	**0.006***
Male	2	19	
Infection source			
Urogenital	7	15	0.42
Anorectal	3	12	
Diabetes mellitus			
(+)	8	25	0.27
(-)	2	2	
Comorbid disease (other than diabetes and obesity)			
(+)	10	13	**0.004***
(-)	0	14	
Obesity			
(+)	4	10	0.86
(-)	6	17	
Bacterial isolate			
(-)	3	10	
Escherichia coli	4	9	0.90
Other	3	8	
Diverting colostomy			
(+)	0	5	0.14
(-)	10	22	

All of the patients in group 1 and 13 of the patients in group 2 had COTDO (p=0.004) (Table 1). Intensive care LOS was significantly higher in group 1 patients (p=0.0001) (Table 2). All of the patients in group 1 stayed in the intensive care unit for 21.6±12.88 days, while 12 of the patients in group 2 stayed in the intensive care unit for 4.41±9.07 days.

Bacterial growth was observed in the wound cultures of 24 patients (64.8%). Bacteria were isolated from the cultures of 7 group 1 patients and 17 group 2 patients. The most common bacterium was *Escherichia coli*, which was isolated in 13 cases (35%). Other bacteria such as *Acinetobacter, Streptococcus, Staphylococcus aureus, Pseudomonas,* and *Klebsiella* were isolated in the wound cultures of 11 patients (29.7%). No significant difference was found between groups in terms of bacterial growth in cultures (Table 1).

In ROC analysis, the UFGSI had a sensitivity of 90% and a specificity of 93% at a threshold value of ≥9. The FGSI had 70% sensitivity and 93% specificity with a threshold of ≥7. The ROC curves are presented in Figure 3.

Table 2. Comparison of parameter means between groups and statistical significance of the differences

	Group 1** (deceased)	Group 2** (surviving)	p
Age (years)	72.4±13.49	52.81±10.32	0.0001*
Body temperature (°C)	37.75±1.01	37.25±0.60	0.139
Heart rate (/min)	101±14.88	90.22±8.79	0.034*
Respiratory rate (/min)	27±4.73	23.03±1.69	0.037*
Serum potassium (mmol/L)	3.64±0.91	4.16±0.80	0.072
Serum sodium (mmol/L)	136.4±4.92	137.18±4.56	0.801
Serum creatinine (mg/100 mL)	1.02±0.71	1.24±0.72	0.229
Hematocrit (%)	31.12±4.19	37.28±6.36	0.009*
Leukocyte count (x1000/mm^3)	21.13±4.47	19.38±5.25	0.353
Serum bicarbonate, venous (mmol/L)	22.58±6.43	22.92±4.15	0.169
VAC treatment duration (days)	32.3±14.5	28.92±18.27	0.489
Hospital length of stay (days)	38.5±17.29	41.04±21.14	0.602
ICU length of stay (days)	21.6±12.88	4.41±9.07	0.0001*

VAC: Vacuum-assisted closure, ICU: Intensive care unit
**Mean ± standard deviation

Table 3. Distribution of Fournier's gangrene severity index and Uludağ Fournier's gangrene severity index scores of the groups

	Group 1 (deceased)	Group 2 (surviving)	p
Body temperature score			
0	5	24	**0.011***
1	5	3	
Heart rate score			
0	6	25	**0.017***
2	4	2	
Respiratory rate score			
0	6	26	**0.004***
1	4	1	
Serum potassium score			
0	2	16	**0.016***
1	6	11	
2	2	0	
Serum sodium score			
0	9	24	0.923
2	1	3	
Serum creatinine score			
0	5	15	0.81
2	4	10	
3	1	1	
4	0	1	
Hematocrit score			
0	7	23	0.336
1	0	1	
2	3	3	
Leukocyte score			
0	1	6	0.617
1	3	9	
2	6	12	
Serum bicarbonate score			
0	2	19	**0.039***
1	1	1	
2	6	6	
3	1	0	
4	0	1	
Dissemination score			
Urogenital or anorectal: 1	3	23	**0.002***
Confined to the pelvic area: 2	2	0	
Extending beyond the pelvic area: 6	5	4	
Age score			
<60:0	2	20	**0.003***
≥60:1	8	7	

The sensitivity, specificity, odds ratios, and positive and negative predictive values for both scoring systems are shown in Table 4. Logistic regression analysis showed that age, DS, presence of COTDO, and intensive care LOS were independent predictive factors associated with mortality (Table 5). In addition, we found that female sex, heart rate, respiratory rate, and hematocrit value were also independent predictive factors associated with mortality.

Discussion

Prediction of mortality in FG continues to be a controversial topic. While 8 of the 16 females in our study died, only 2 of the 21 males died (Table 1). Comparison of the deceased and surviving groups confirmed that female sex was associated with higher mortality risk and was an independent predictive factor. As in our study, it has also been argued in some previous studies that female sex is a risk factor for mortality.[10,11]

Age is an important issue that has consistently emerged as a factor influencing mortality in many studies conducted to date.[7,9,12,13] We also found significant differences between the groups for patients above and below the age of 60 years (Tables 2 and 3). In addition, our analysis showed that age was an independent predictive factor for mortality.

The second noteworthy finding of our study was that DS was significantly higher in group 1 patients compared to group 2 patients (Tables 3 and 5). In line with the studies reported by Yılmazlar et al.[9,14], we found a significant correlation between DS and mortality and determined that it is an independent predictive factor.

Table 4. Uludağ Fournier's gangrene severity index and Fournier's gangrene severity index results with threshold values

	Threshold value 95% CI	Sensitivity	Specificity	Odds ratio	PPV	NPV
UFGSI	≥9*	90%	93%	34.86%	71%	85%
FGSI	≥7*	70%	93%	25.13%	66.6%	81.4%

CI: Confidence interval, PPV: Positive predictive value, NPV: Negative predictive value, UFGSI: Uludağ Fournier's gangrene severity index, FGSI: Fournier's gangrene severity index

Table 5. Distribution of age, extent of infection score, presence of comorbidities other than diabetes and obesity, and intensive care length of stay in the groups

	Group 1 (deceased)	Group 2 (surviving)	p
Age (years)			
	72.4±13.49**	52.81±10.32**	**0.0001***
Age score			
<60:0	2	20	**0.003***
>60:1	8	7	
Comorbidity (other than diabetes and obesity)			
(+)	10	13	**0.004***
(-)	0	14	
Dissemination score			
Urogenital or anorectal: 1	3	23	
Confined to the pelvic area: 2	2	0	**0.002***
Extending beyond the pelvic area: 6	5	4	
ICU length of stay (days)			
	21.6±12.88**	4.41±9.07**	**0.0001***

**Mean ± standard deviation, ICU: Intensive care unit

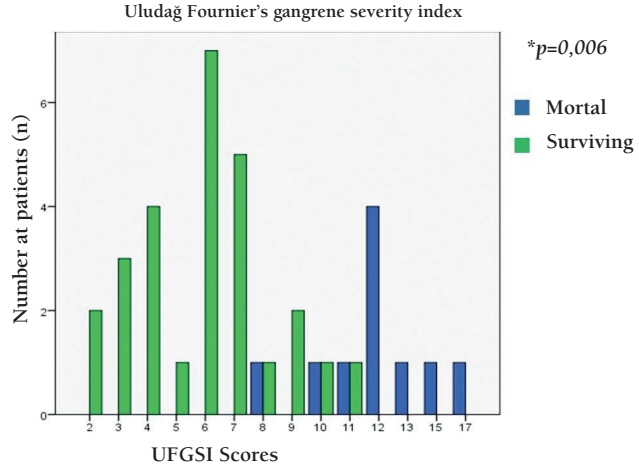

Figure 1. Distribution of patients according to UFGSI
UFGSI: Uludağ Fournier's gangrene severity index

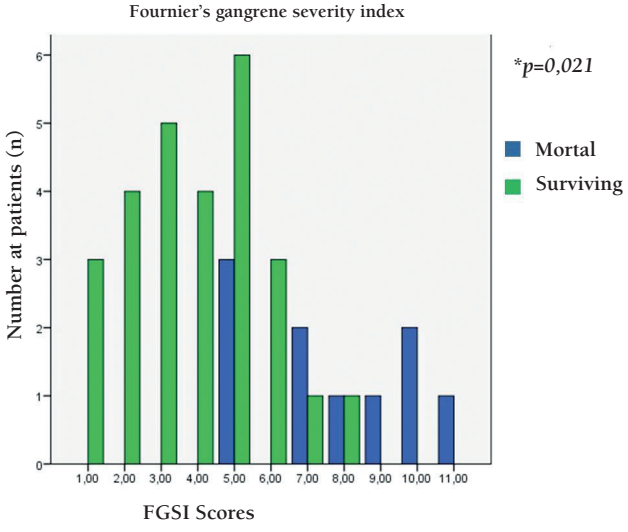

Figure 2. Distribution of patients according to FGSI
FGSI: Fournier's gangrene severity index

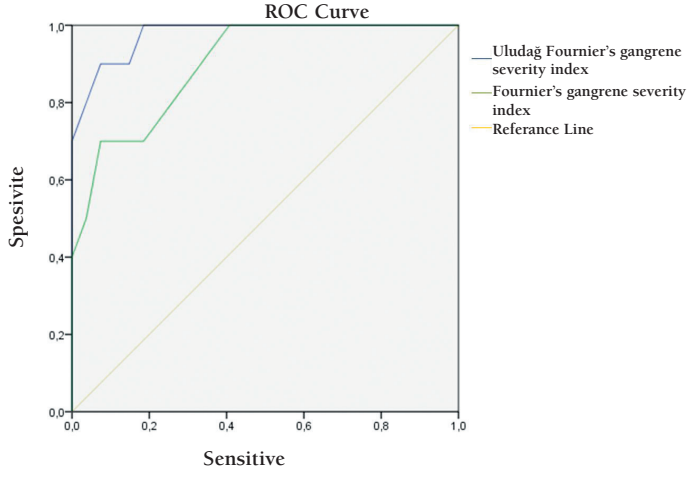

Figure 3. ROC curves for the Fournier's gangrene severity index and Uludağ Fournier's gangrene severity index
ROC: Receiver operating characteristic

Many previous studies have investigated the role of comorbid diseases in mortality. DM, which is considered one of the factors affecting FG, was present in 33 patients (89%) in our study (Table 1). However, we were unable to detect a correlation between DM and mortality in this study. Although the prevalence of DM was also high in other studies, DM alone does not impact mortality.[7,9,12] In our study, we found that although the presence of DM and obesity alone were not associated with mortality, comorbidities such as malignancies, heart failure, and respiratory failure had a significant effect on mortality (Table 1 and 5). The presence of COTDO was found to be an independent predictive factor for mortality.

In this study, hospital LOS did not differ significantly between the groups, but intensive care LOS was significantly longer in the deceased group (Table 2 and 5). Intensive care LOS was also observed to be an independent predictive factor for mortality. We did not encounter this result in other publications. This result is also among the most remarkable findings of our study.

Although the UFGSI and FGSI, which are the most widely used methods for predicting mortality due to FG, have shown acceptably high sensitivity and specificity, both scoring systems are quite complex. Due to this complexity, their implementation is not practical in the clinical setting. We believe that simpler and more practical scoring systems are needed. As mortality is a nearly inevitable outcome in patients with the four salient factors in our study, it may be possible to reduce mortality rates by minimizing intensive care LOS, which is a modifiable risk factor. With early diagnosis and extensive surgical debridement, DS can also be reduced by rapidly localizing infection to restricted areas, thus preventing mortality. The other significant factors in our study, age and comorbidities, are nonmodifiable host-related factors.

In our study, scores in the FGSI and UFGSI, which are scoring systems that predict mortality in patients with FG, were associated with mortality. Both scoring systems were found have 93% specificity (Table 4). Sensitivity was 90% for the UFGSI and 70% for the FGSI. Yılmazlar et al.[9] reported 94% sensitivity and 81% specificity for the UFGSI. Our results are similar to those reported by Yılmazlar et al.[9] Roghmann et al.[7] reported 85% sensitivity and 67% specificity for the UFGSI. In the aforementioned two studies, sensitivity and specificity for the FGSI were 65%-100% and 88-67%, respectively. In another study by Yılmazlar et al.[14], no patient with an UFGSI score ≥9 survived in a series of 120 patients. They reported threshold values of 9 and 7 for the UFGSI and FGSI, respectively. In the present study, we also used UFGSI and FGSI score thresholds of 9 and 7, respectively (Table 4).

In our study, 9 of the 13 patients with UFGSI scores ≥9 died, while only 1 of the 24 patients with scores of <9 died (Figure 1). Seven of the 9 patients with FGSI scores ≥7 died, while 3 of the 28 patients with scores <7 died (Figure 2). Although Yilmazlar et al.[9] reported no survival for patients with UFGSI scores ≥9 in their series of 120 patients, in our study there were 4 survivors among our patients with UFGSI scores ≥9 (Figure 1). There were also 2 survivors among patients with FGSI scores ≥7. Although these patients had scores above the threshold values and were at high risk of mortality, rapid and extensive debridement and effective treatment resulted in some survivors.

The most common bacterial species encountered in our study was *E. coli* (Table 1).[7,15] However, positive cultures and the bacterial species isolated were not associated with mortality.

We never recommend fecal diversion unless the patient has extensive sphincter damage or large perineal wounds. VAC therapy enables less frequent dressing changes, causes less pain, and has similar costs compared to traditional wound dressings in the treatment of FG patients. Using this method, the area of debridement can be kept clean, can heal quickly, and the need for fecal diversion and repeated debridement can be reduced.

Limitations of our study are its retrospective nature and the low number of patients. There are no large patient series pertaining to FG in the literature. The fact that we have a homogeneous patient population managed with the same treatment strategy is a strength of our study.

In conclusion, there are issues that remain to be clarified regarding the prediction of mortality in FG. Simple and practical scoring systems can assist clinicians in terms of modifiable factors that can reduce mortality rates. This study demonstrated very significant differences between deceased and surviving patients in DS, presence of COTDO, and intensive care LOS, and showed that these factors were independent predictive factors associated with mortality. Our findings suggest that these factors can serve as predictive indicators of mortality in FG. All of the predictions set forth in our study hypothesis were investigated and all were confirmed. In order for our findings to gain general acceptance in the literature, further research is needed to investigate the mortality predictive factors proposed here in a larger series of FG cases.

Ethics

Ethics Committee Approval: The study was approved by the İstanbul Okmeydanı Training and Research Hospital Ethics Committee (Approval no: 05.06.2018/925).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: S.E., B.G., M.Y., S.H., D.Ö.K., Concept: S.E., S.K., Design: S.E., Data Collection or Processing: S.E., S.K., Analysis or Interpretation: S.E., S.K., Literature Search: : S.E., Writing: S.E.

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RESEARCH ARTICLE

Evaluation of Constipation Risk among Inpatients in Surgery and Internal Medicine Wards

Cerrahi ve Dahili Kliniklerde Yatan Hastalarda Konstipasyon Riskinin Değerlendirilmesi

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ABSTRACT

Aim: This study was conducted to evaluate the risk of constipation among inpatients in the surgery and internal medicine wards.

Method: This descriptive study included 251 inpatients being treated in the Ağrı State Hospital between April 2018 and June 2018 who consented to participate. Data were collected using a personal information form and the constipation risk assessment scale (CRAS).

Results: The mean age of the participants was 49.74±19.50 years. Analysis of the patients' distributions according to mean CRAS score and socio-demographic characteristics showed that gender, marital status, education level, and occupation were statistically significant ($p<0.05$, $p<0.01$). In addition, when the distribution of the patients according to mean CRAS total score and health status/lifestyle characteristics was examined, statistically significant differences were observed in terms of hospital ward, presence of chronic disease, regular medication use, predominant food group, skipping meals, regular exercise, constipation problem, and constipation risk ($p<0.05$, $p<0.01$). There was a statistically significant positive correlation between total CRAS score and age ($p<0.01$).

Conclusion: Older age was associated with more problems with constipation in our study group. Therefore, it is recommended to prevent or solve the problem through constipation risk assessment for inpatients, early diagnosis of constipation, appropriate nursing interventions, and team collaboration.

Keywords: Constipation, constipation risk assessment, constipation care

ÖZ

Amaç: Bu araştırma, cerrahi ve dahili kliniklerde yatan hastalarda konstipasyon riskinin değerlendirilmesi amacıyla yapıldı.

Yöntem: Tanımlayıcı tipteki çalışma, Ağrı Devlet Hastanesi'nde Nisan 2018-Haziran 2018 tarihleri arasında servislerde yatan ve çalışmayı kabul eden 251 hastanın katılımıyla yapıldı. Veriler kişisel bilgi formu ve konstipasyon risk değerlendirme ölçeği (KRDÖ) kullanılarak toplandı.

Bulgular: Araştırmaya katılanların yaş ortalaması 49,74±19,50 idi. Araştırmaya katılan hastaların KRDÖ toplam puan ortalamaları ile sosyo-demografik özelliklerine göre dağılımları incelendiğinde; cinsiyet, medeni durum, eğitim durumu ve meslek özellikleri arasında istatistiksel olarak anlamlı fark olduğu bulundu ($p<0,05$, $p<0,01$). Ayrıca, hastaların KRDÖ toplam puan ortalamaları ile sağlık durumu ve yaşam tarzı özelliklerine göre dağılımları incelendiğinde; hastanın yattığı servis, kronik hastalık durumu, düzenli ilaç kullanımı, en çok tüketilen besin grubu, öğüt atlama durumu, düzenli egzersiz yapma, kabızlık sorunu ve konstipasyon riski özellikleri açısından istatistiksel olarak anlamlı fark olduğu belirlendi ($p<0,05$, $p<0,01$). KRDÖ toplam puanı ile yaş arasında pozitif yönde istatistiksel açıdan anlamlı bir ilişki olduğu bulundu ($p<0,01$).

Sonuç: Çalışmaya katılan hastaların yaşları arttıkça, konstipasyon sorununu daha fazla yaşadıkları belirlendi. Bu nedenle özellikle yatan hastaların konstipasyon risk değerlendirilmesinin yapılması, konstipasyon sorununun erken dönemde tanılanması, uygun hemşirelik girişimleri ve ekip iş birliği ile sorunun önlenmesi ya da çözülmesi önerilmektedir.

Anahtar Kelimeler: Konstipasyon, konstipasyon risk değerlendirmesi, konstipasyonda bakım

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Introduction

Constipation is a clinical entity of variable etiology that can cause complaints such as abdominal pain, bloating, cramps, nausea, vomiting, and malnutrition.[1,2,3] It is also described as a condition that affects both body and mind, causing feelings of panic and helplessness. Due to the nature of this problem, patients find it difficult to discuss and often feel that medical personnel do not give it sufficient consideration.[4] Constipation also increases the risk of megacolon, volvulus, colorectal cancer, and psychological conditions such as depression and mood disorders.[5,6]

Several risk factors and etiologies have been reported in relation to the development of constipation. A review of factors associated with constipation reported pelvic floor dysfunction (hernia, prolapse), colorectal disorders (irritable bowel syndrome, tumors), neuromuscular disorders (Parkinson's disease, stroke) and metabolic disorders (diabetes, hypokalemia) among its causes.[7] It has also been reported that psychological disorders like depression are associated with constipation, and the prevalence of constipation was found to be significantly higher among individuals with dementia compared to a control group.[8] In addition, certain medications, such as opioid analgesics and drugs with anticholinergic properties, are known to provoke constipation.[7,9] Associations between constipation and low mobility, dehydration, addiction, and nutritional problems have also been reported.[10,11]

Constipation is a common health problem in the general population, with an incidence of 2-28% reported in the literature.[12,13] According to the results of population-based studies conducted in Turkey, the incidence of constipation varies between 22-40% in our country.[14] Various studies have shown that constipation is more common in females than males, in blacks versus whites, and in children and the elderly compared to adults.[15] In particular, the bowel habits of hospital inpatients change due to immobility during treatment, the effects of some drugs, and staying in the hospital, which can cause constipation. In patients undergoing surgery, constipation risk increases in the early postoperative period due to being bedbound, taking opioid/non-opioid analgesic drugs, and having to defecate while in bed using a bedpan. Postoperative constipation prolongs hospital stays, causes comorbidity in addition to the existing disorders, and adversely affects patients' quality of life.[12,16] The aim of the current study was to assess constipation risk among patients hospitalized in the internal medicine and general surgery departments for any reason.

Materials and Methods

Research Design

This is a descriptive study.

Population and sample: The study population consisted of patients admitted to various units of Ağrı State Hospital between April 2018 and June 2018. The study sample included patients hospitalized in the internal medicine and surgery departments of Ağrı State Hospital who volunteered to participate in the study, were over 18 years of age, and had no communication problems.

Data Collection Tools

Personal data form: Consisted of 16 questions prepared by the researchers to gather descriptive data about the patients.

Constipation risk assessment scale: Developed in 2005 by Richmond and Wright.[17] Validity and reliability studies for the Turkish version of the constipation risk assessment scale (CRAS) were conducted by Kutlu et al.[18] in 2010. The scale consists of four sections including lifestyle, hospital-related factors, physiological and psychological conditions, and drugs that increase constipation risk. The lifestyle section has five subheadings: gender, mobility, fiber intake, fluid intake, and personal beliefs. There are a total of 16 questions under these five subheadings. The hospital-related section has two subcategories, one for ward patients only and one for patients who require a bedpan. There are a total of two questions under these two subheadings. The physiological and psychological conditions section has seven subheadings: metabolic disorders, pelvic conditions, neuromuscular disorders, endocrine disorders, colorectal/abdominal disorders, psychiatric illnesses, and learning disabilities/dementia. There are six subheadings in the section regarding drugs that increase constipation risk: antiemetics, calcium channel blockers, iron supplements, anticholinergic-containing drugs, analgesics, and cytotoxic chemotherapy. Subscores are written at the end of each section and the total score is used to determine the patient's constipation risk group. A subtotal of 1-11 points can be obtained in the lifestyle section, 0-4 for hospital-related factors, 0-18 for physiological and psychological conditions, and 0-30 points in the section about drugs that increase constipation risk. Therefore, the total score obtained from the CRAS is between 1 and 63. A score of 1-10 is considered low risk, 11-15 as moderate risk, and 16 or more as high risk.[17,18]

Data collection: The study data were collected in face-to-face interviews with inpatients in the internal medicine and surgery units between April 2018 and June 2018. Completing the data collection forms took about 10 minutes.

Data analysis: Data analysis was done using SPSS statistics software. Data were analyzed using numbers, percents, mean, Kolmogorov-Smirnov test, Kruskal-Wallis test, Mann-Whitney U test, and Spearman correlation analysis.

Table 1. Distribution of the patients' mean total constipation risk assessment scale scores according to socio-demographic characteristics (n=251)

Variable	n (%)	X ± SD	U/KW
Gender			
Male	155 (61.8)	49.20±21.07	U=5269
Female	96 (38.2)	50.60±16.73	p=0.000**
Marital status			
Married	190 (75.7)	9.26±4.40	KW=13.985
Single	43 (17.1)	6.79±3.61	p=0.001*
Widowed	18 (7.2)	8.06±4.36	
Education level			
Illiterate	92 (36.7)	10.32±4.68	
Elementary school	109 (43.4)	7.86±4.10	KW=21.149
High school	43 (17.1)	8.14±3.57	p=0.000**
University	7 (2.8)	5.71±1.79	
Occupation			
Employed	56 (22.3)	7.32±3.41	KW=6.528
Unemployed	175 (69.7)	9.11±4.55	p=0.038*
Retired	20 (8.0)	9.55±4.37	
Income level			
Income less than expenses	90 (35.9)	8.47±4.68	KW=1.375
Income equal to expenses	148 (59)	8.87±4.09	p=0.503
Income greater than expenses	13 (5.2)	9.31±5.25	
Age, years			
49.74±19.50			
(min. 18, max. 88)			

KW: Kruskal-Wallis, SD: Standard deviation, Min: Minimum, Max: Maximum, X: Mean
*p<0.05, **p<0.01

Study limitations: Being conducted in a single center in a single province of Turkey is a limitation of this study.

Results

Of the 251 participants, 61.8% were males, 75.7% were married, 43.4% were primary school graduates, 69.7% were unemployed, and 59% had income equal to their expenses. The mean age of the participants was 49.74±19.50 years (Table 1). Analysis of mean CRAS total scores according to socio-demographic characteristics revealed statistically significant differences in CRAS scores based on gender, marital status, education level, and occupation (p<0.05, p<0.01, Table 1), but there was no statistically significant difference in terms of income status (p>0.05; Table 1).

It was found that 20.3% of the study participants were in the internal medicine ward, 65.7% had no chronic diseases, 94.4% did not have hemorrhoids, 59% were not on a regular medication, 53.8% consumed meat and dairy products, 53.8% did not skip meals, 60.6% drank 2 liters of water a day, 86.9% did not exercise regularly, 82.5% did not have a problem with constipation, 92.8% had not used laxatives, and 69.7% had low constipation risk (Table 2).

Analysis of mean CRAS total score distribution according to health status and lifestyle parameters revealed statistically significant differences in CRAS scores based on the patient's ward, chronic diseases, regular medication, predominant food group, skipping meals, regular exercise, constipation problem, and constipation risk factors (p<0.05, p<0.01; Table 2), but no significant differences were observed in terms of daily fluid intake, presence of hemorrhoids, or use of laxatives (p>0.05; Table 2).

There was a statistically significant positive correlation between mean CRAS total score and age (p<0.01; Table 3).

Discussion

Constipation is a serious problem that may result in fatal intestinal obstruction due to clinical symptoms being overlooked.[19,20] In population-based studies with large

Table 2. Distribution of the patients' mean total constipation risk assessment scale scores according to health status and lifestyle characteristics (n=251)

Variable	n (%)	X ± SD	U/KW
Ward			
General surgery	35 (13.9)	7.57±3.09	
Internal medicine	51 (20.3)	10.49±4.07	
ENT	47 (18.7)	8.17±5.10	KW=17.097
Urology	26 (10.4)	8.85±4.73	p=0.009**
Orthopedics	40 (15.9)	7.75±4.18	
Plastic surgery	6 (2.4)	9.17±3.86	
Cardiology/pulmonology	46 (18.3)	9.07±4.27	
Chronic disease			
Yes	86 (34.3)	11.05±4.39	U=3720
No	165 (65.7)	7.55±3.84	p=0.000**
Hemorrhoids			
Yes	14 (5.6)	8.64±4.12	U=1653
No	237 (94.4)	8.76±4.38	p=0.982
Regular medication use			
Yes	103 (41)	10.79±4.79	U=4283
No	148 (59)	7.33±3.38	p=0.000**
Predominant food group			
Grains	83 (33.1)	9.22±4.86	
Meat and dairy	135 (53.8)	8.01±3.71	KW=8.523
Fruit and vegetables	33 (13.1)	10.61±4.87	p=0.014*
Skips meals?			
Yes	116 (46.2)	9.60±4.75	U=6397.5
No	135 (53.8)	8.01±3.86	p=0.012*
Daily fluid intake			
Less than 1 L	56 (22.3)	10.32±5.65	KW=5.639
2 L	152 (60.6)	8.24±3.70	p=0.060
2-3 L	43 (17.1)	8.49±4.22	
Regular exercise			
Yes	33 (13.1)	7.09±3.36	U=2709.5
No	218 (86.9)	9.00±4.44	p=0.022*
Constipation problem			
Yes	44 (17.5)	10.98±4.89	U=3017
No	207 (82.5)	8.28±4.10	p=0.000**
Laxative use			
Yes	18 (7.2)	10.06±4.19	U=1665.5
No	233 (92.8)	8.65±4.36	p=0.145
Constipation risk			
Low, ≤10 points	175 (69.7)	6.43±2.43	KW=161.575
Moderate, 11-15 points	56 (22.3)	12.70±1.36	p=0.000**
High, ≥16 points	20 (8)	17.95±2.52	

ENT: Otorhinolaryngology, KW: Kruskal-Wallis, SD: Standard deviation, X: Mean
*p<0.05, **p<0.01

Table 3. Correlation between constipation risk assessment scale total score and age

		Constipation risk assessment scale total score
Age	r	0.342*
	p	0.000

*p<0.01

samples, constipation was reported to be twice as common in females than in males.[15,21,22] Bilgiç et al.[23] also found that women experienced constipation more often than men. Similarly, the female participants had a higher mean constipation risk score. It has been shown in the literature that low education level is associated with higher prevalence of constipation.[15,24] Our finding of higher mean constipation risk score among the illiterate participants in this study supports the literature. This suggests a possible link between education level and diet.

Constipation is one of the most common postoperative complications. The prevalence of constipation among inpatients has been reported as 79%.[25] According to a study by Celik et al.,[26] 25-40% of patients hospitalized for abdominal surgery had evacuation difficulty. In the current study, patients in the internal medicine ward were found to have higher mean constipation risk score. This may be because patients being treated in internal medicine are those with extended hospital stays, restricted movement, and regular medications due to chronic diseases.

Studies have indicated a negative correlation between constipation and physical activity.[27,28] Uysal et al.[29] determined that constipation was more common in people who did not exercise and had a sedentary lifestyle. In the literature, sedentary lifestyle is a well documented risk factor for constipation.[12,16,26,30] In a study conducted in women having constipation, 74.3% were found to have a sedentary lifestyle.[31] Consistent with the literature, the group of participants in our study who reported not exercising regularly had a higher mean constipation risk score.

The results of a study by Sendir et al.[16] indicated that the patients were in the moderate risk group with a mean CRAS score of 12.73±4.75. On the other hand, the mean CRAS scores obtained in our study showed that most of the participants were in the low-risk group. Most studies have shown that the prevalence of constipation increases with older age. Evidence suggests that constipation incidence increases with age, with 40% of those aged 65 and older having problems with constipation.[21,22] It is one of the common complaints of geriatric patients and can result in morbidity among elderly nursing homes residents.[32,33] Constipation has been described as a distressing, chronic, and recurrent problem that affects approximately 50-73% of elderly nursing home residents.[34] Bailes and Reeve[35] determined that 28% of males aged 84 and over experienced constipation. In accordance with literature data, the present study revealed a significant positive correlation between patient age and constipation risk.

In conclusion, this study elucidated risk factors affecting constipation and relationships among them. It is clear that older age in particular is a significant and nonmodifiable risk factor. However, constipation can be prevented or resolved by managing the other risk factors based on the patient's current condition. We recommend that nurses, as one of the members of the medical team who have the most contact with patients, conduct constipation risk assessment for inpatients, work in cooperation with the medical staff, and prepare guidelines regarding this issue.

Ethics

Ethics Committee Approval: The study was approved by the Ağrı İbrahim Çeçen University Local Ethics Committee (approval number: 95531838-900).

Informed Consent: Consent form was filled out by all participants.

Peer-review: External and internal peer-reviewed.

Authorship Contributions

Concept: Ş.K.A., Design: Ş.K.A., Data Collection or Processing: Ş.K.A., Analysis or Interpretation: Ş.K.A., Literature Search: Ş.K.A., Writing: Ş.K.A.

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RESEARCH ARTICLE

Compliance with Quality Standards and Causes of Incomplete Colonoscopy: A Prospective Observational Study

Kolonoskopide Kalite Standartlarına Uyum ve İnkomplet Kolonoskopi Nedenleri: Prospektif Gözlemsel Çalışma

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ABSTRACT

Aim: To evaluate incomplete colonoscopy rate, factors affecting incomplete colonoscopy, and compliance with colonoscopy quality standards in our clinic.

Method: This prospective study was conducted in a tertiary health center between January 2017 and December 2017. Demographic characteristics of individuals undergoing colonoscopy, their colon cleansing status, causes of incomplete colonoscopy, and factors affecting incomplete colonoscopy were investigated.

Results: A total of 756 people were included in this study. The mean age was 54±12.74 years and 63% of the patients were female. Mean body mass index (BMI) was 28.32±4.84 and 309 (40.9%) had history of prior abdominal surgery. The duration of cecal intubation was 355±187 seconds and colonoscopy could not be completed in 89 patients (11.8%). Advanced age (p=0.036), female gender (p=0.036), high BMI values (p=0.042), presence of comorbidity (p=0.004), antiaggregant/anticoagulant use (p=0.001), and inadequate bowel cleansing (p<0.001) were found to be significant factors for incomplete colonoscopy. Excluding the patients who had inadequate colon cleansing and were recommended to repeat the procedure, colonoscopy was completed in 93.9% (667/710) of patients. Inadequate bowel preparation was the most common cause of incomplete colonoscopy (51.6%) and male gender (p=0.047), antiaggregant/anticoagulant use (p=0.021) were identified as factors affecting colon cleansing. Polyp detection rate was 24.7% (165/667), below the currently recommended rate of detection of adenoma.

Conclusion: Inadequate bowel preparation, advanced age, female gender, high BMI, presence of comorbidity, use of antiaggregant/anticoagulant are risk factors for incomplete colonoscopy. We are below colonoscopy quality standards due to high incomplete colonoscopy rate and low adenoma detection rate due to inadequate bowel preparation.

Keywords: Incomplete colonoscopy, bowel preparation, quality in colonoscopy

ÖZ

Amaç: Kolorektal patolojilerin tanısında kolonoskopi altın standarttır ve klinik uygulamalarda sık yapılan bir işlemdir. Bu çalışmada inkomplet kolonoskopi oranı, kolonoskopinin tamamlanmamasına etki eden faktörler ve kliniğimizin kolonoskopi kalite standartlarına uygunluğunun değerlendirilmesi amaçlanmıştır.

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Yöntem: Çalışma Ocak 2017-Aralık 2017 tarihleri arasında üçüncü basamak sağlık merkezinde prospektif olarak yapıldı. Kolonoskopi yapılan bireylerin demografik özellikleri, kolon temizlik durumu, inkomplet kolonoskopi nedenleri ve inkomplet kolonoskopiye etki eden faktörler incelendi. Kolonoskopisi tamamlanan ve tamamlanmayan popülasyon karşılaştırıldı.
Bulgular: Toplam 756 kişi çalışmaya alındı. Yaş ortalaması 54±12,74 yıl olup %63'ü kadındı. Üç yüz kırk yedisinde (%45,9) komorbidite mevcuttu. Popülasyonun vücut kitle endeksi (VKİ) ortalaması 28,32±4,84 olup, 309'unda (%40,9) geçirilmiş batın cerrahi öyküsü vardı. Çekum entübasyon süresi 355±187 saniye olup 89 kişide (%11) kolonoskopi tamamlanamadı. İleri yaş (p=0,036), kadın cinsiyet (p=0,036), yüksek VKİ değeri (p=0,042), komorbidite varlığı (p=0,004), antiagregan/antikoagülan kullanımı (p=0,001), yetersiz barsak temizliği (p=<0,001) inkomplet kolonoskopi lehine anlamlı saptandı. Uygun barsak hazırlığı yapılamayan ve işlem tekrarı önerilen 46 (%6,1) vaka dışlandığında %93,9'unda (667/710) kolonoskopi tamamlanmıştır. Kötü barsak hazırlığı inkomplet kolonoskopinin en sık nedeni olup (%51,6), erkek cinsiyet (p=0,047) ve antiagregan-antikoagülan kullanımın (p=0,021) kolon temizliğine etki eden faktörler olarak belirlenmiştir. Kolonoskopisi tamamlanan grupta polip saptanma oranı %24,7 (165/667) olup güncel önerilen polip saptanma oranının altında kalmıştır.
Sonuç: Uygun olmayan barsak temizliği, ileri yaş, kadın cinsiyet, artan VKİ, komorbidite ve antiagregan/antikoagülan kullanımı inkomplet kolonoskopiye etki eden faktörlerdir. Uygun olmayan barsak temizliğinin ana nedeni olduğu yüksek inkomplet kolonoskopi oranı ve düşük polip saptama oranı nedeniyle kolonoskopi kalite standartlarının altında kaldığımız görülmektedir.
Anahtar Kelimeler: İnkomplet kolonoskopi, barsak hazırlığı, kolonoskopide kalite

Introduction

Colorectal cancers are common and the fourth most common malignancy-related cause of death worldwide. It is estimated that 2.2 million new diagnoses and 1.1 million mortality cases will develop annually by 2030.[1] Colonoscopy; is a reliable method with high diagnostic accuracy and good patient tolerance under sedation which is frequently used in daily practice in the diagnosis and treatment of colorectal diseases. It is a gold standard in colorectal cancer screenings and significantly reduces the frequency and mortality of colorectal cancer by allowing adenomas to be removed.[2,3] In colonoscopic evaluation; it is aimed to reach cecum safely and in some clinical situations it is aimed to evaluate the ileum. Cecum intubation is recommended in 90% of all colonoscopic procedures and 95% of colonoscopies for screening purposes. One of the quality indicators of colonoscopic evaluation is cecum intubation and is not always possible. Incomplete colonoscopy rates are reported between 4-25%.[4,5] Adequate bowel preparation is the most important factor affecting completion rates. Inadequate bowel cleansing rate in all colonoscopy procedures is around 20-25%. Inadequate bowel preparation reduces adenoma detection rates, prolongs the procedure time, increases workload and costs.[5,6,7,8] Leading causes of incomplete colonoscopy include; inadequate colon cleansing, advanced age, female gender, low body mass index (BMI), previous abdominal or pelvic surgery, diverticulosis, long-tortious colon, procedure without sedation and inexperienced endoscopist.[9,10,11,12,13,14] In our endoscopy unit, approximately 2000 colonoscopes are performed annually. It is important that clinics assess their own results, observe compliance with quality standards in the colonoscopy, and correct any deficiencies that are identified. In this study, it was aimed to evaluate incomplete colonoscopy rate, factors affecting incomplete colonoscopy and compliance of our clinic with colonoscopy quality standards.

Materials and Methods

Between January 1, 2017 and December 31, 2017, consecutive colonoscopic procedures were recorded prospectively in our endoscopy unit of our clinic. Adhering to the Helsinki declaration, the regional ethics committee for the study was approved. Participants were informed before the procedure and their written approval was received. In this study, individuals with American Society of Anesthesiologists (ASA) score of 1-2-3, without anesthetic agent allergy, outpatients, individuals older than 18 years of age and to whom procedure was applied under sedation were included. Individuals with ASA score of 4, patients who were urgently treated for bleeding and obstruction, patients with colorectal surgery history, presence of inflammatory bowel disease, those with malignancy compatible lesions during procedure, individuals who underwent therapeutic colonoscopy due to polyposis syndromes and known pathology were all excluded. Also, those who could not continue due to hypoxia, hypotension, allergic reaction, etc. during the procedure were excluded from the study.

Mechanical bowel preparation: three days before the colonoscopy appointment, soft food was given and clear food intake was provided one day before the procedure. Mechanical bowel clearance was achieved by the ingestion of 90 mL sodium phosphate (NaP) divided into two doses 8-12 hours before the procedure. Single dose of enema was given in the morning of procedure. An informative form, describing the diet and mechanical bowel cleansing, were given. A polyethyleneglycol (PEG) solution was given to the group (such as patients with kidney disease) where NaP uptake was not appropriate. Colon cleansing was divided into 4 categories according to Boston bowel preparation scale score.[15,16] Score 0; unprepared colon segment with mucosa not seen because of solid stool that cannot be cleared, score 1; portion of mucosa of the colon segment seen, but other

areas of the colon segment are not well seen because of staining, residual stool, and/or opaque liquid, score 2; minor amount of residual staining, small fragments of stool, and/or opaque liquid, but mucosa of colon segment is seen well, score 3; entire mucosa of colon segment seen well, with no residual staining, small fragments of stool, or opaque liquid. Scores of 0 and 1 were considered as suboptimal, score of 2 and above were considered as optimal.

Colonoscopy procedure: all of the procedures were performed by a gastroenterologist/gastrointestinal surgeon with an experience of at least 500 colonoscopy procedures. All colonoscopic evaluations were performed with a video colonoscopy device (EC530WL3, Fujinon, Willich, Germany). Completion of colonoscopy; was defined as the visualization of ileocecal valve and appendiceal orifice or insertion into the ileum. The time elapsed from the anal entrance to the cecum was recorded in seconds and was defined as cecal intubation time. The evaluation of the colon mucosa and additional interventional procedures were performed while withdrawing from the cecum. Manoeuvre such as abdominal pressure, prone or supine position were recorded. Abdominal pressure and manoeuvre for changing position were separately grouped.

Anesthesia procedure: appropriate vein route was opened, 3-5 L/min oxygen is delivered with nasal cannula at left decubitus position, heart rate and saturation tracking was made with pulse oximeter. Blood pressure values were monitored at starting and every 5 minutes after that. Sedation was achieved mostly using the combination of midazolam, fentanyl and propofol under the control of a anesthesiologist. Age, gender, comorbid conditions, reason for colonoscopy, BMI, abdominopelvic surgery history, used antiagregant-anticoagulant drugs, maneuvers during procedure, duration of cecal intubation, ratio and localization of detected polyps and diverticulitis were all determined. Polyp detection rates were considered to be valid for the complete colonoscopy group. Bowel preparation score and reason of incomplete procedure (pollution, risk of perforation due to presence of excessive diverticulum, looping, inadequacy of colonoscope length, sharp angulation etc.) were recorded. Populations, in whom colonoscopy was compeleted or not completed, were compared.

Statistical Analysis

Statistical software for statistical package for the social sciences (SPSS 22 Inc., Chicago, IL, USA) was used for biostatistical analysis (SPSS 22 Inc., Chicago, IL, USA). The data obtained from the patients participating in the study; were expressed as mean, standard deviation values and as percentage where necessary. The distribution of the data was checked by the Kolmogorov Smirnov test. Data with normal distribution were analyzed by student t-test. Group analysis of non-parametric data was made with Mann-Whitney U test. Categorical groups were compared with chi-square test. $P<0.05$ was considered as statistically significant.

Results

Between the dates specified, 756 colonoscopies were performed in accordance with the study criteria. The mean age of the population was 54±12.7 (range 18-88) years and 63% were female. The mean BMI was 28.3±4.8 kg/m^2, and there was comorbidity in 347 (45.9%) patients. The general characteristics of the study population are summarized in Table 1. Colonoscopy was completed in 667 (88.2%) subjects and the mean cecal intubation time was 355±187 seconds. When 46 cases (6.1%), who had incomplete bowel preparation and process should be repeated, were excluded; colonoscopy was completed in 93.9% (667/710) of cases. The polyp detection rate was found to be 24.7% (165/667) and the frequency of diverticulum was 10.2%. Bowel preparation was adequate in 588 cases (77.7%) (Boston Bowel Preparation score ≥2) whereas it was not optimal in 168 cases (22.2%). The procedure was not completed in 89 people (11.8%). When the causes of incomplete colonoscopy were examined; inadequate bowel preparation was in the first place with a ratio of 51.6% (Table 2). Looping (33.9%) and intolerance (6.7%) were the most common causes of incomplete colonoscopy in those with adequate colon cleansing. Other causes of incomplete colonoscopy include; sharp angulation in 4 cases (4.5%), diverticulosis in 2 cases (2.2%) and external compression in 1 case (1.1%). The data obtained from the comparison of complete and incomplete colonoscopy groups were presented in Table 3. In comparison; age ($p=0.036$), female gender ($p=0.036$), high BMI value ($p=0.042$), presence of comorbidity ($p=0.004$), use of antiagregant/anticoagulant ($p=0.001$), inadequate bowel cleansing ($p<0.001$) were found to be significant in favor of incomplete colonoscopy. Mean BMI value in incomplete and complete colonoscopy groups were 29.66±4.59 and 27.30±4.83, respectively and the difference between these two groups was significant ($p=0.042$). In the complete colonoscopy group, the rate of maneuvering was 56.1% while in the uncompleted group it was 38.2%, which was statistically significant ($p<0.001$). Previous abdominal and pelvic surgery had no effect on the completion of the colonoscopy procedure ($p=0.172$). When colon cleansing was separated into two groups in terms of being optimal and suboptimal; number of individuals with a bowel preparation score of 0 and 1 were (suboptimal) 168 (Table 4). When examining parameters affecting bowel cleansing; male gender and the use of antiagregant/anticoagulant drug were found to be statistically significant.

Table 1. Baseline characteristics of the population

Variables	Total (n=756)	%
Age (mean ± SD)	54±12.7	
Sex (M/F)	280/476	37/63
BMI (kg/m^2) ± SD	28.3±4.8	
Comorbidity	347	45.9
Hypertension	224	29.6
Diabetes mellitus	149	19.7
Coroner artery disease	120	15.9
Chronic obstructive pulmonary disease	30	4
Chronic renal failure	3	0.4
History of abdominal or pelvic surgery	309	40.9
Gynecological	176	23.3
Appendectomy	65	8.6
Hepatobiliary	60	7.9
Upper gastrointestinal	30	4
Umbilical hernia	16	2.1
Malignancy	8	1.1
Antiagregan and/or anticoagulant use	133	17.6
Aspirin	76	10.4
Clopidegrol	16	2.1
Coumadin	25	3.3
Aspirin+clopidegrol	13	1.7
Other	3	0.1
Colonoscopy requirement		
Constipation	134	17.7
Screening	114	15.1
Anemia	93	12.3
Rectal bleeding	85	11.2
Abdominal pain	78	10.3
Fecal occult blood positive	62	8.2
Diarrhea	57	7.5
Follow-up after polypectomy	51	6.7
Change in defecation habits	24	3.2
Other reasons	58	7.7
Complete colonoscopy	667	88.2
Incomplete colonoscopy	89	11.8
Cecal intubation time (second) ± SD	355±187	
Bowel preparation score		
3	305	40.3
2	283	37.4
1	122	16.1
0	46	6.1
Maneuvering rates	327	43.3
Abdominal pressure	168	22.2
Change of position	33	4.4
Performing two maneuvers	126	16.7
Polyp detection rate	165/667	24.7
Diverticule detection rate	77	10.2

BMI: Body mass index, F: Female, M: Male, SD: Standard deviation

Table 2. Reasons for incomplete colonoscopy

Reason for failure (n=89)	n	%
Inadequate bowel preparation	46	51.6
Looping and/or redundancy	30	33.9
Discomfort and intolerance	6	6.7
Angulation	4	4.5
Diverticulosis	2	2.2
External compression	1	1.1

Table 3. Comparison of complete and incomplete colonoscopy populations

Variables	Complete colonoscopy (n, %) (Total=667)	Incomplete colonoscopy (n, %) (Total=89)	p value
Age (mean ± SD)	53.03±12.7	56.62±12.1	0.036*
Sex			
M	250 (37.5)	30 (33.7)	0.036*
F	417 (62.5)	59 (66.3)	
BMI (kg/m²) ± SD	27.30±4.83	29.66±4.59	0.042*
Comorbidity			
Yes	294 (44.1)	53 (59.6)	0.004*
No	373 (55.9)	36 (40.4)	
History of abdominal or pelvic surgery	268 (40.2)	41 (46.1)	0.172
Antiagregan and/ or anticoagulant use	105 (15.7)	28 (31.5)	0.001*
Bowel preparation score			
3	373 (40.9)	32 (36)	<0.001*
2	272 (40.8)	11 (12.4)	
1	122 (18.2)	0 (0)	
0	0 (0)	46 (51.6)	
Maneuvering rates			
Abdominal prossure	374 (56.1)	34 (38.2)	<0.001*
Change of position	166 (24.9)	2 (2.2)	
Performing two maneuvers	33 (4.9)	0 (0)	
	94 (14.1)	32 (36)	

BMI: Body mass index, F: Female, M: Male, SD: Standard deviation, *: p<0.05

Table 4. Comparison of factors affecting bowel preparation score

Variables	Bowel preparation score ≥2 (Optimal n=587)	Bowel preparation score 1 and 0 (Suboptimal n=168)	p value
Age (mean ± SD)	53.88±12.8	54.45±12.6	0.603
Sex			
M	208/280 (74.3%)	72/280 (25.7%)	0.047*
F	380/476 (79.8%)	96/476 (20.1%)	
Comorbidity	261 (44.4%)	86 (51.2%)	0.435
History of abdominal or pelvic surgery	236 (40.1%)	73 (43.5%)	0.477
Antiagregan and/ or anticoagulant use	93 (15.8%)	40 (23.8%)	0.021*
BMI ± SD	28.2±4.7	28.6±5.02	0.357

BMI: Body mass index, F: Female, M: Male, SD: Standard deviation, *: p<0.05

Ninety six (57.1%) of the patients with suboptimal bowel cleansing were male (p=0.047). Colon cleansing was suboptimal in 25.7% (72/280) of male patients participating in the study, while colon cleansing was suboptimal in 20.2% (96/476) of female patients. The drug use ratio in adequate preparation group was 15.8% (93), whereas the drug use ratio in inadequate preparation group was 23.8% (40) (p=0.021). The polyp detection rate in completed colonoscopy group (165/667) was 24.7%. Only 17 (17.9%) polyps were detected in 122 patients with bowel cleansing score 1. Sigmoid colon (69), rectum (55) and descending colon (32) were the most common segments in which polyps were observed. Forty-five patients had polyps in more than one segment. Diverticulum was found in 77 (10.2%) patients. Fifty-five of them (71.4%) were seen in sigmoid colon, 24 were seen (31.1%) in descending colon, 15 were seen in (19.4%) transvers colon, 11 were seen in (14.3%) ascending colon and 4 were seen in (5.4%) cecum. In forty-four people (57.1%) diverticulum was detected in more than one colonic segment.

Discussion

Colonoscopy is often used in diagnosis and treatment of colon diseases. It is safe, the rate of diagnosis is high and well tolerated when applied optimally. It is quite effective in preventing the development of colorectal cancer by allowing the detection and removal of premalign lesions.[2,3,4,5] It is very important to evaluate the entire mucosa by reaching

the proximal side of the ileocecal valve and removing all adenomas after detection. Cecum intubation is recommended in 90% of all colonoscopic procedures and 95% of colonoscopies for screening purposes.[4] Undoubtedly it is very important that the bowel cleansing is adequate for a qualified evaluation. This shortens the time of cecal intubation and increases the rate of adenoma detection by allowing the entire mucosa to be examined.[5,16,17] Incomplete colonoscopy causes are classified under three main headings. Patient related factors include; discomfort and intolerance, low BMI, tortuous-redundant colon, angule-fixed colon segment, prior abdominal-pelvic surgery, extensive diverticulosis, female sex, and young age. Technical factors include; severe looping, suboptimal preparation ve ineffective sedation. The third one is the experience of endoscopist.[8,9,10,11,12,13,18,19,20] In a study of Koido et al.,[9] being older than 65 years of age, female gender, past abdominal or pelvic surgery, inadequate bowel cleansing, and inflammatory bowel disease were identified as factors affecting incomplete colonoscopy. When the factors affecting incomplete colonoscopy in our study were examined; advanced age, female gender, presence of comorbidity, high BMI, use of antiagregant and/or anticoagulant, and inadequate bowel preparation were found to be statistically significant. Although low BMI was defined as a factor that increases the duration of cecal intubation and decreases the rate of complete colonoscopy in the literature; different results were obtained in our study (p=0.042). However, the evaluation was not made after categorizing the BMI value; the result was weak and open to debate. Although the importance of bowel cleansing is known; in 2811 colonoscopy procedures, 925 (33%) patients were reported to have inadequate colon cleansing in a prospective study by Hassan et al.[18] Inadequate preparation leads to increased costs, increased workload in the health care system, missed precancerous lesions, and reduces the quality of colonoscopy.[4,5,16,17,18] Advanced age, male sex, being inpatient, polypharmacy, constipation, cirrhosis, diabetes mellitus, Parkinson's disease, stroke, hypertension, previous colorectal surgery are conditions related with inadequate bowel preparation.[16,17,18,21,22] In a prospective study of Hendry et al.,[23] including 10571 consecutive patients, inadequate bowel preparation was reported with a ratio of 16.9%. In this study, inadequate bowel preparation and incomplete colonoscopy rates were found to be significantly higher, especially in the inpatient group. The incidence of incomplete colonoscopy was 11.8% in our study and in 46 (6.1%) cases inadequate bowel preparation was found to be the most important cause. When patients with inadequate bowel preparation was excluded, colonoscopy was completed in 93.9% (667/710) of patients. PEG is the most commonly used solution in bowel preparation worldwide.[5,16,17] PEG solution in our country is not prescribed by physicians since it is not covered by health insurance. This may also lead to inadequate bowel preparation. Although different results were reported in the literature, there is no significant difference between NaP and PEG in terms of bowel cleansing.[17] In 168 patients who were accepted as suboptimal with bowel preparation score of 1 and 0 (22.2%), male gender (p=0.047) and antiagregant-anticoagulant use (p=0.021) were determined as factors affecting bowel cleansing. It was seen that age, comorbid status, prior abdominal-pelvic surgery and BMI did not have any effect on bowel cleansing. Split-dose delivery of solutions for colon cleansing is strongly recommended. Besides after taking the second dose of solution; optimal colon cleansing rates can be achieved between 4-13th hours.[4,5,16,17] Practice in our clinic is using the second dose of NaP solution between 22-24 hours the night before the procedure. For about 9 hours passed during the day of procedure and this delay was longer for afternoon appointments. After this study, our clinical practice was revised. First dose of NaP was switched from 20:00 p.m. to 23:00 p.m. and the second dose was switched to one o'clock at night. In addition, prosedures are planned to be carried out predominantly between 08-12 hours. Other causes of incomplete colonoscopy include; looping in 30 cases (33.9%), intolerance in 6 cases (6.7%), sharp angulation in 4 cases (4.5%), diverticulosis in 2 cases (2.2%) and external compression in 1 case (1.1%). Conscious and moderate sedation is often sufficient for colonoscopy. In young women, in those with chronic abdominal pain, long-term opiate users and those with abdominal surgical history; propofol-assisted sedation increases the success of procedure.[8,24] In the presence of looping, sharp angulation, curved or long colon; abdominal compression under appropriate sedation, changing the position and using pediatric colonoscopy and endoscopy are most practical methods that can be used in endoscopy unit. If available, it would be appropriate to get help from the experienced endoscopist.[8,11] Rex et al.,[25] completed colonoscopy in their study without a need of additional imaging method in 117/119 patients who referred to them because of incomplete colonoscopy. In that study; procedures were completed with a high ratio under appropriate anesthesia, by adequate use of time and effective maneuvers and by using pediatric colonoscope or endoscope available in the endoscopy unit.[25] However, standard colonoscopy may fail for several reasons in a small group of patients. In this case, current options include; magnetic endoscope imaging system Scope Guide (Olympus Optical), double-contrast barium enema, computed tomography or magnetic resonans colonography, overtube-assisted colonoscopy, double-balloon endoscopy,

single-balloon endoscopy, colon capsule and C-Scan Cap imaging systems.[8,19,26,27,28,29,30] In our country, auxiliary methods other than double-contrast barium enema are located in limited centers and their costs are high. The non-therapeutic approach and low diagnostic rates of barium scans are significant disadvantages. Therefore, the repeatability of the procedure by another endoscopist with sufficient experience should be the most logical first choice in our country for incomplete colonoscopy with appropriate bowel preparation and sufficient anesthesia support. One of the quality indicators of colonoscopy is adenoma detection rate. The American College of Gastroenterology and American Society for Gastrointestinal Endoscopy, suggest that adenoma detection rate should be at least 25%.[4] In the Polish study published in 2010, it was found that post-colonoscopy cancer development increased by more than 10 fold if adenoma detection rate was below 20%.[31] Improving adenoma detection rates on screening colonoscopies reduces interval colorectal cancer development and cancer-related mortality rates.[32] The frequent occurrence of flat adenomas, aggressive tumor behavior, and late diagnosis in the proximal colon negatively affect prognosis. Therefore, careful evaluation of the proximal colon should be aimed at colonoscopies for screening and anemia.[4,33] In a current study of van Renteln et al.,[34] long-term cecal intubation time was defined as a factor that can reduce adenoma detection rates. It is detected that when retrograd evaluation of cecum is conducted, at least 6 minutes should be given because adenoma detection rate can be decreased under this period.[35] In our study, the detection rate of polyps in the complete colonoscopy group was 24.7% (165/667) and this was slightly below the currently recommended rate of adenoma detection. It will not be appropriate to comment on polyp detection rates because parameters such as endoscopist factor, retrograd evaluation from cecum and total procedure duration. Certainly there are some limitations of this study. Our sample size could be larger to make a strong recommendation. The endoscopist who performed the procedure was not specified. The most important reason for incomplete colonoscopy is the inadequacy of bowel cleansing but the factors for its causes are not elaborated. For example, no information is available regarding compliance with the dietary administration procedure and use of bowel preparation solution. The total duration of the procedure and how to approach to the incomplete colonoscopy group were not completed. The results of the revision in clinical practice in the intestinal preparation procedure have not yet been collected.

Conclusion

Incomplete colonoscopy ratio was 11.8% and adenoma detection ratio was detected as 24.7% which were below the guidelines recommendation. Inadequate bowel preparation, advanced age, female gender, presence of comorbidity, high BMI, antiagregant and/or anticoagulant use are factors affecting incomplete colonoscopy. Inadequate bowel preparation constitutes the majority of incomplete colonoscopy causes and continues to be a current problem. Male gender and use of antiagregant/anticoagulant are parameters that negatively affect inadequate bowel preparation. We anticipate that quality standards will be reached in colonoscopy by ensuring proper colon cleansing.

Ethics

Ethics Committee Approval: The study was approved by the University of Healty Sciences Kartal Koşuyolu Yüksek İhtisas Training and Research Hospital Local Ethics Committee (approval no: 2017.1/2-21).

Informed Consent: Consent form was filled out by all participants.

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Authorship Contributions

Surgical and Medical Practices: U.A., E.G., R.K., S.A., Concept: U.A., E.G., E.P., E.B., Design: U.A., E.G., H.Ç., D.A.Ç., E.B., Data Collection or Processing: U.A., E.G., H.Ç., R.K., S.A., Analysis or Interpretation: U.A., E.B., E.P., S.A., Literature Search: U.A., H.Ç., D.A.Ç., R.K., E.P., Writing: U.A., E.G.

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RESEARCH ARTICLE

Duration of the Sypmtoms Influence the Outcome after Botulinum Toxin Injection in Anal Fissure

Anal Fissürde Semptom Süresinin Botulinum Toksini Uygulaması Sonrası Sonuçlara Etkisi

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ABSTRACT

Aim: To assess the effect of duration of the symptoms on outcome after botulinum toxin injection in anal fissure treatment.

Method: Data of the patients who underwent botulinum toxin injection for chronic anal fissur were reviewed. Patients with a minimum follow-up of 18 months were included. One-hundred IU botulinum toxine was injected in the internal anal sphincter through 4 quadrants. Follow-up was carried out by clinic visits on post-procedure days 7, 15 and 30 and by telephone survey in 3, 6, 12 and 18th months. Refractory symptoms or recurrence were recorded as failure. The relationship between duration of the symptoms and failure was investigated and a cut-off value was determined. Patients were divided into two groups according to duration of the symtoms and outcome was compared with the patients who underwent lateral internal sphincterotomy within the same period.

Results: There were 56 patients fulfilling inclusion criteria. Mean age was 33.1±9.4 and 39 (69.6%) patients were female. Presence of the symptoms longer than 8.5 months was predicting treatment failure (Area under curve: 0.721, confidence interval: 0.500-0.942, p=0.037). There were 38 patients in shorter symptoms group, 18 patients in longer sypmtoms group and 32 patients in lateral internal sphincterotomy group. The compelte healing rates after 21 (18-28) months of median survival were 61.1% in longer symptom botulinum toxin group, 94.7% in shorter symptom botulinum toxin group and 96.2% in lateral internal sphincterotomy group (p=0.003). One patient in botulinum toxin groups had local hematoma and one (3.1%) had minor incontinence in lateral internal sphincterotomy group.

Conclusion: Botulinum toxin has similar outcome with lateral internal sphincterotomy in patients with shorter suration of sypmtoms. Proper patient selection may contribute to the success of the treatment in chronic anal fissur.

Keywords: Botulinum toxin, anal fissure, lateral internal sphincterotomy

ÖZ

Amaç: Anal fissürde semptom süresinin botulinum toksini uygulaması sonrası tedaviye yanıtsızlık ve nüks üzerindeki etkisini araştırmaktır.

Yöntem: Mart 2016'dan itibaren anal fissür nedeniyle botulinum toksini uygulanan hastaların verileri incelendi. Takip süresi en az 18 ay olan hastalar çalışmaya dahil edildi. Hastalara internal sfinktere 4 kadrandan 100 IU botulinum toksin-A uygulandı. İşlem sonrası 7, 15, 30. günlerde poliklinik kontrolü ile; 3, 6, 12 ve 18. aylarda telefonla aranarak değerlendirme yapıldı. Botulinum toksini uygulamasına yanıtsızlık ya da nüks başarısızlık olarak kaydedildi. Semptom süresi ve başarısızlık arasındaki ilişki alıcı işletim karakteristiği analizi ile araştırıldı ve bulunan kesme değerine göre iki gruba ayrılan botulinum toksini uygulanan hastalar aynı dönemde lateral internal sfinkterotomi ile tedavi edilmiş hastalarla karşılaştırıldı.

Bulgular: Botulinum toksini uygulanan 56 hastada ortalama yaş 33,1±9,4 idi. Hastaların 39'u (%69,6) kadındı. Ortalama semptom süresi 8,5±7,4 aydı. Ortanca 21 (18-28) aylık izlem süresinde 47 (%83,9) hastada iyileşme oldu. Semptom süresinin 8,5 aydan uzun olması tedavi başarısızlığını öngörmekteydi (Eğri altındaki alan: 0,721, güven aralığı: 0,500-0,942, p=0,037). Hastalar semptom süresine göre 2 gruba ayrılarak aynı dönemde lateral internal sfinkterotomi yapılan 32 hasta ile sonuçları karşılaştırıldı. İyileşme oranları semptom süresi uzun olan botulinum toksini grubunda %61,1, semptom süresi kısa olan botulinum toksini grubunda %94,7 ve lateral internal sfinkterotomi grubunda %96,2 idi (p=0,003). Botulinum toksini uygulaması sonrası 1 hastada lokal hematom, lateral internal sfinkterotomi uygulaması sonrası 1 (%3,1) hastada minör inkontinens görüldü.

Sonuç: Anal fissür tedavisinde botulinum toksini uygulaması semptom süresi kısa olan hastalarda lateral internal sfinkterotomi ile benzer etkinliktedir. Botulinum toksini uygulamasında hasta seçimi tedavi başarısını etkileyebilir.

Anahtar Kelimeler: Botulinum toksini, anal fissür, lateral internal sfinkterotomi

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Introduction

Anal fissure (AF) is a painful tear extending from the anal canal to the dentate line. Although the exact pathophysiology is not known, an increase in anal tonus, decreased anodermal blood flow and local ischemia are possible mechanism.[1] Most patients have various degrees of constipation and defecation problems. These patients are in a vicious circle where pain, increased anal tonus and demanding excretion trigger each other. This cycle results in chronic inflammation and ischemic ulcers that do not heal. Symptoms lasting longer than 8 weeks are defined as chronic AF.[2] In chronic AF, usually internal sphincter fibers appear in the anal canal. Hypertrophic anal papillae and skin tag may accompany.

Topical nitrates and calcium channel blockers relieve the symptoms in more than half of the patients, but up to 50% recurrence rates and side effects limit the use of topical treatments in chronic AF.[3,4] The most effective treatment modality in chronic AF is lateral internal sfinkterotomy (LIS) and it is recommended to use it as the first step without waiting for failure with topical treatments in selected patients.[2] In many randomized controlled trials, recovery rates after LIS have been shown to be higher and recurrence is lower than topical nitrate, calcium channel blockers and botulinum toxin (BT) treatments.[5,6,7] However, post-LIS incontinence rates are still reported as high as 8-30%.[8,9]

BT is a reliable and effective method for treating AF with similar healing rates and a lower side effect profile compared to topical treatments.[10,11,12] Lack of persistent side effects, easy applicability and reproducibility have brought BT as an alternative to LIS. The American Society for Colorectal Surgeons (ASCRS) 2017 reported that BT and topical treatments were equally effective at the first step in the treatment of chronic AF.[2] In a new meta-analysis, the effectiveness of LIS was emphasized, but it was proposed to take into account the risk-benefit analysis in the choice of treatment because of the high rates of postoperative complications.[13]

In chronic AF treatment, there are still no guidelines on which treatment is most effective and reliable, and there are no widely accepted guidelines in the treatment of chronic AF. In clinical practice, there is a tendency to prefer LIS instead of conservative treatments. Failure and costs can be reduced after treatment if it is determined which patients can benefit from less invasive methods such as BT; complications of surgical treatment can be avoided. In our study, we aimed to investigate the effect of symptom duration on outcome with hypothesis that patients with shorter symptom duration may have more benefit with BT treatment.

Materials and Methods

The study was approved by the ethics committee of the university. All patients were informed in detail about the outcomes and complications of treatment options and written informed consent was obtained from the patients for both interventions and using their data in the study. The authors' first step approach in acute AF is 8-week-old topical diltiazem oinment, abundant fiber diet, stool softeners and hot water sitting bath. Patients with complaints longer than 8 weeks were evaluated as chronic AF regardless of previous history of topical treatment. BT or LIS was recommended for the first-line treatment. Age, sex, fertility, continence, socio-economic conditions and patient wish were evaluated and treatment method was decided. The authors started to use BT in clinical practice since 2016, therefore, data of the patients who were assessed for AF after 2016 were reviewed retrospectively for the study. Patients who underwent BT or LIS due to chronic AF and had a follow-up of at least 18 months were included in the study. Patients with inflammatory bowel disease, malignancy, previous anorectal surgery and other accompanying perianal disease (anal fistula, hemorrhoids, etc.) were excluded from the study.

All patients were diagnosed with AF by history and rectal digital examination. Over eight weeks of complaints accompanying ulcers or tears of anal canal were evaluated as chronic AF. Presence of hypertrophic papilla and/or skin tag was recorded. The anal tonus was recorded as low, normal and high by the surgeon as the subject during rectal examination. The results of anal manometric examination were not used in the study because manometry could not be applied in every patient for economic reasons. The diagnosis of chronic constipation was made according to Rome IV criteria.[14]

Application of Botulinum Toxin

The procedures were performed at outpatient clinic without anesthesia except for one patient who received general anesthesia. Lyophilized 100 IU BT Type-A (BOTOX, Alergan, CA, USA) was applied after diluated with 1 cc saline and 26-G injector was used to inject 25 unit toxin in 4 quadrants, to the alignment of clock 12, 3, 6 and 9 to internal anal sphincters.

Lateral Internal Sphincterotomy

The operations were performed in the operating room under spinal anesthesi on her own will. In the lithotomy position, the internal sphincter was divided by electrocautery from the incision made at 3 o'clock position. The wound was left open. The patients were discharged on the same day after surgery.

Follow up

All patients were examined at the outpatient clinic on the 7th, 15th and 30th days. Complications, fissure epithelization and complications were evaluated. Cleveland Clinic Incontinence Score was used in the diagnosis of incontinence.[15] The patients who had complete healing after first 30 days were not routinely followed at clinic visits anymore. They were advised to apply to our department if any complaints occur. All patients were inquired at the 3rd, 6th, 12th and 18th months by telephone. The patients who had complaints at telephone survey were invited for the examination. Complete recovery of symptoms and epithelialization in the fissure was defined as complete healing. Regardless of the fissure epithelization, if pain or bleeding has still existed on postoperative 30th day, the patients was counted in no-response group. Relaps of the symptoms after complete healing was defined as recurrence. Patients with no-response and recurrence were included in 'tratment failure' group. In case of treatment failure, readministration of BT or LIS was recommended to the patients.

Study Groups

The cut-off value of symptom duration to be determined for the success of BT administration was calculated and patients were divided into two groups according to the duration of symptoms. The results of the patients with short and long duration of the symptoms were compared with those underwent LIS during the same period.

Statistical Analysis

The analyzes were performed with SPSS 21 program. Variables were expressed as mean and standard deviation. Chi-square test was used for comparisons between categorical variables, and independent samples t-test was used for comparisons between continuous variables. The cut-off values of the factors predicting treatment failure were determined by ROC analysis.

Results

Between March 2016 and July 2018, 117 patients underwent a BT due to AF by a single surgeon. 38 patients with a follow-up of less than 18 months were excluded from the study. 13 patients due to other accompanying perianal disease, 4 patients due to previous anorectal surgery, 2 patients due to inflammatory bowel disease and 1 patient due to malignancy were excluded from the study. Three patients could not be reached after 3-month controls. A total of 56 patients were included in the study. The mean age was 33.1±9.4 (range, 18-57), 39 (69.6%) were female and 17 (30.4%) were male. Mean duration of symptoms was 8.5±7.4 months (range, 2 to 36 months), and duration of constipaion was 18.9±34 months (range, 2 to 200). Of the patients, 35 (62.5%) had chronic constipation. In 11 (28.2%) female patients, onset of symptoms was associated with pregnancy or delivery. Detailed demographic and clinical features are given in Table 1. After the first 30 days, 53 (94.6%) patients had complete recovery. Three (5.4%) patients had no-response to treatment. One of them was reintroduced to BT, two of them underwent LIS and all had complete recovery. Recurrence was observed at the 5th month in a patient who underwent BT for the second time.

Table 1. Demographic and clinical characteristics of patients

	n (%)
Age (year, mean ± SD)	**33.1±9.4**
Sex	
Female	39 (69.6)
Male	17 (30.4)
Duration of the symptoms (month, mean ± SD)	8.5±7.4
Duration of constipation (month, mean ± SD)	18.9±34
Chronic constipation	
No	22 (33.8)
Yes	42 (66.2)
Previous medical treatment	
No	11 (19.6)
Yes	45 (80.4)
Fissure site	
Posterior	50 (89.3)
Anterior	4 (7.1)
Multiple	2 (3.6)
Skin tag/anal papilla	
No	25 (44.6)
Yes	31 (55.4)
Anal tonus	
Normal	13 (23.2)
High	43 (76.8)
Relationship with pregnancy/childbirth	
No	28 (71.8)
Yes	11 (28.2)
Result	
Complete healing	47 (83.9)
No-response	3 (5.4)
Recurrence	6 (10.7)
Time to recurrence (months, mean ± SD)	7.3±1.9

SD: Standard deviation

Table 2. Subgroup analysis of the patients regarding duration of the sypmtoms and comparison of the subgroups with lateral internal sphincterotomy group

	BT (n=56)		LIS (n=32)	p
	<8.5 months (n=38)	≥8.5 months (n=18)		
Age (year, mean ± SD)	33.2±9.3	32.7±10.2	30±9.1	0.151
Sex				0.318
Female	28	11	21	
Male	10	7	11	
Result				0.003
Complete healing	36 (94.7%)	11 (61.1%)	31 (96.2%)	
No-response	-	3 (16.6%)	-	
Recurrence	2 (5.3%)	4 (22.2%)	1 (3.1%)	

SD: Standard deviation, BT: Botulinum toxin, LIS: Lateral internal sphincterotomy

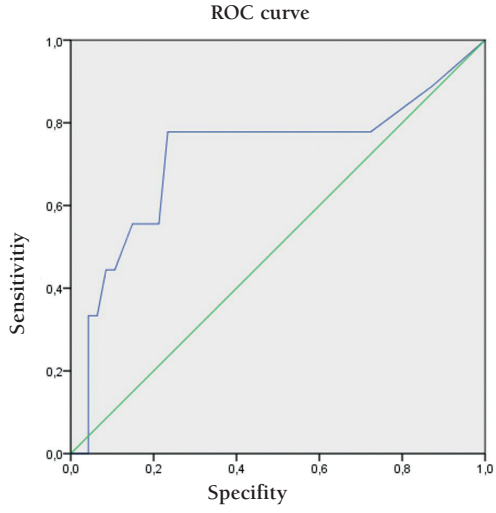

Figure 1. Receiver operative characteristic curve for duration of the symptoms (area under curve: 0.721, confidence interval: 0.500-0.942, p=0.037)

These three patients were evaluated in the tratment failure group. In the follow-up, 6 patients relapse AF in a mean of 7.3±1.9 months. All patients underwent complete recovery after LIS. No incontinence was observed in any patient. In one (1.7%) patient, local hematoma developed in the anal region and spontaneously regressed within 1 week.

After median 21 (18-28) months, 47 (83.9%) patients had complete recovery. Three patients with no-response and 6 with recurrence, 16.1% of the patients were recorded as treatment failure. The mean symptom duration was 7.5±6.68 months in patients with successful treatment, and 13.8±8.9 months in patients who failed treatment (p=0.017). The symptom duration longer than 8.5 months predicted treatment failure with 78% sensitivity and 77% specificity.

The data of 51 patients who underwent LIS due to chronic AF during the same period with BT patients were analyzed. Thirteen patients did not complete 18-month follow-up period, 5 patients with concomitant perianal disease, and 1 had previous hemorrhoidectomy were excluded from the study. Patients treated with BT were grouped according to the 8.5 month cut-off value and compared to 32 patients who underwent LIS and met the inclusion criteria. The complete healing rate in BT patients was 61.1% in ≥8.5 months group and 94.7% in <8.5 months group (p=0.003). In LIS group, complete healing was observed in 96.2% of the patients. There was no difference in complete healing rate between <8.5 months BT group and LIS group (p>0.005) (Table 2). One (3.1%) of patients in the LIS group developed minor incontinence (Cleveland Clinic Incontinence Score: 4).

Discussion

The most effective method in AF treatment is LIS. Although LIS is a day-case procedure, it's performed under general or spinal anesthesia. Although less important complications such as pain, hemorrhage, perianalsepsis, and hematoma other than incontinence have not been well studied in the literature, they can be quite painful in clinical practice. Therefore, less interventional therapies have always been the focus of attention in the treatment of AF. Medical treatment options of topical calcium channel blockers and nitrates do not provide satisfactory long-term results.[3,4] Low adherence to these treatments and headache caused by nitrates were also associated with failure.[16] Today, medical treatment is the first choice only in the treatment of acute AF.[2]

Botulinum toxin, which causes temporary paralysis in the internal anal sphincter, is a less invasive and safe alternative

to LIS. There is no widely accepted dose and injection points in the clinical practice. In two meta-analyzes published in 2016, it was concluded that BT did not have a dose-dependent effect in terms of recovery, incontinence, and recurrence, but the studies were very heterogeneous and the follow-up period was short.[17,18] There was no difference between the injection points in both meta-analyzes. In a recent study with a median follow-up of 25 months, high-dose (80-100 IU) and low dose (20-40 IU) BT were compared and high dose BT was found to be superior to low dose in terms of patient satisfaction (90% vs 78%, p=0.05) and recurrence (23% vs 53%, p=0.0001). Long-term incontinence was not reported in either group. In our study, 100 IU BT was applied to all patients and incontinence was not observed.

In a meta-analysis of 6 studies including 393 patients, treatment response was reported as 28.6% for BT and 42.1% for nitrates (p=0.24).[12] In our study, the rate of non-response to treatment was 5.4% and increased to 16.6% in patients with complaints longer than 8.5 months. In the same meta-analysis, recurrence after BT and nitrate was 18.5% and 25.1% (p=0.22). While transient incontinence was higher with BT (10.4%) compared to nitrates (4.4%) (p=0.06), BT was found to be superior to nitrates regarding overall side-effects (33% vs 6.4%, p=0.01). Topical treatment duration, BT doses and follow-up periods were very heterogeneous, and the definitons of chronic AF and complete healing were conflicting in this meta-analysis. These result indicate the clinical conflictions in AF treatment.

In another meta-analysis, 44 randomized controlled trials involving 3268 patients with anal dilatation, LIS, anoplasty and/or fissurectomy, BT, and topical therapies were reviewed.[13] The median follow-up was 2 years, and complete healing rates were 25-96% and 38-100% for BT and LIS. Incontinence rates were 0-10% for BT and 0-44% for LIS. In our study, incontinence did not develop after BT and minor incontinence occurred in 1 (3.1%) patient who underwent LIS. In this meta-analysis, failure rates after BT were 0-78%. In our patients, the failure rate after BT was 16%. This rate decreases to 5.3%, which is comparable with LIS (3.1%) in patients with shorter duration of symptoms.

There is no widely accepted patient selection criteria and algorithms for BT which has been increasingly preferred as the first-line therapy for chronic AF. Clinicians usually determine the treatment options individually by considering benefit-risk analysis. Although there is no evidence to support this view in the literature, we think that surgical treatment will result in better long-term satisfaction in patients with long symptom duration and chronic constipation. Theoretically, if the factors associated with sphincter spasm and anal trauma persist after the BT effect has vanished, the relapse of the disease will be easier. We believe that this possibility is higher in patients with long-term symptoms.

Determination of risk factors for no-response or recurrence after BT may provide better selection of the patients who are going to have more benefit from BT. In the literature, there are a few studies investigating factors related with recurrence after BT application.[19,20] These studies revealed that persisting pain after 30 days and the lack of high anal tone were associated with recurrence. In a randomized controlled trial of 99 patients in Iran in 2015, the results of LIS and topical diltiazem + BT were compared.[21] At the end of one-year follow-up, healing rates were 65% in BT + diltiazem group and 94% in LIS group. Complete healing rates for both BT and LIS were reported to be 100% in patients with a symptom duration of less than 12 months. The complete recovery rate of LIS and BT + diltiazem was 86% and 23% in patients with symptom duration longer than 12 months (p<0.001). Differently from this study, we fund a cut-off value associated with treatment failure and showed that patients with <8.5 months of symptoms had more benefit from BT. In our study, no topical treatment was performed with BT or LIS.

Study Limitations

The major limitations of our study are the retrospective design and small number of patients. Subgroup analysis according to the duration of symptoms in LIS group was not performed because of small number and lack of data. Our follow-up period is sufficient considering that most of the previous studies has reported 12 months or shorter terms results.

Anal BT is a minimally invasive, safe and effective treatment. Complete healing rates are high, however no-response and recurrence rates are still unsatisfactory when compared to LIS. In patients with shorter symptoms, outcome of BT can be better. Randomized trials should be performed to determine the criteria for BT treatment in AF.

Ethics

Ethics Committee Approval: The study was approved by the İstanbul Medipol University Ethics Committee (approval number: 10840098-604.01.01-E.45124).

Informed Consent: Written informed consent was obtained from the patients.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: N.Ç.A., Concept: N.Ç.A., Y.Ö., Design: N.Ç.A., Y.Ö., Data Collection or Processing: N.Ç.A., Y.Ö., Analysis or Interpretation: Y.Ö., N.Ç.A., Literature Search: Y.Ö., Writing: N.Ç.A., Y.Ö.

Conflict of Interest: No conflict of interest was declared by the authors.

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RESEARCH ARTICLE

Magnetic Resonance Imaging Value to Predict Pathologic Staging in Locally Advanced Rectal Cancer After Neoadjuvant Chemoradiation

Lokal İleri Rektum Tümöründe Neoadjuvan Kemoradyasyon Sonrası Patolojik Evrelemeyi Tahmin Etmek İçin Manyetik Rezonans Görüntülemenin Değeri

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ABSTRACT

Aim: This study was designed to evaluate the role of magnetic resonance imaging (MRI) on preoperative restaging of locally advanced rectal cancer after neoadjuvant chemoradiotherapy (CRT), in order to facilitate individualization of surgical management.

Method: We analyzed 117 patients who had received neoadjuvant CRT, underwent a MRI before and after CRT. All patients underwent restaging MRI followed by surgery after the end of CRT. The primary end point of this study was to estimate the accuracy of post-CRT MRI as compared with pathologic staging.

Results: Pathologic T classification matched the post-CRT MRI findings in 44 (37.6%) of 117 patients. Sensitivity in T0, T1, T2, T3 and T4 was 23.8%, 16.7%, 25.6%, 48.9% and 83.3% respectively. Specificity in T0, T1, T2, T3 and T4 were 87.5%, 93.7%, 79.5%, and 64% and 88.3% respectively. Sensitivity in N0 and N1 were 82% and 20% respectively. Specificity was 88% in N0 and 87% in N1. Fifty two (44.4%) of 117 patients were downstaged in T classification. Pathologic N classification matched the post-CRI MRI findings in 73 (62.4%) of 117 patients. Twenty one (17.9%) were overstaged in N classification. Twenty seven (23%) of 117 patients who had been down staged on MRI after CRT were confirmed on the pathological staging with same stage (T and N). 17p with ypT0 were correlated with MRI after CRT in 5 patients (4.3%).

Conclusion: MRI has low accuracy for restaging locally advanced rectal cancer after preoperative CRT so it is currently not consistent enough for clinical application.

Keywords: MRI, neoadjuvant chemoradiotherapy, prediction

ÖZ

Amaç: Bu çalışma, neoadjuvan kemoradyoterapi (CRT) sonrası lokal ileri rektum kanserinin preoperatif olarak yeniden düzenlenmesinde, cerrahi tedavinin bireyselleştirilmesini kolaylaştırmak için manyetik rezonans görüntülemenin (MRG) rolünü değerlendirmek için tasarlanmıştır.

Yöntem: MRG öncesi ve sonrasında neoadjuvan CRT alan 117 hastayı inceledik. Tüm hastalara yeniden evreleme için MRG ve takiben CRT bittikten sonra operasyon yapıldı. Bu çalışmanın birincil bitiş noktası, CRT sonrası MRG evrelemesinin patolojik evrelemeye göre doğruluğunu tahmin etmekti.

Bulgular: Patolojik T sınıflaması, CRT sonrası MRG bulgularını 117 hastanın 44'ünde (%37,6) eşleştirdi. T0, T1, T2, T3 ve T4'te sensitivite sırasıyla %23,8, %16,7, %25,6, %48,9 ve %83,3 idi. T0, T1, T2, T3 ve T4'te spesifite sırasıyla %87,5, % 93,7, %79,5 ve %64 ve %88,3 idi. N0 ve N1'de sensitivite sırasıyla %82 ve %20 idi. Spesifite N0'da %88 ve N1'de %87 idi. Yüz onyedi hastadan 52 tanesi (% 44,4) T sınıflamasına alındı. Patolojik N sınıflaması, 117 hastanın 73'ünde (% 62,4) CRT sonrası MRG bulgularına uyuyordu. Yirmi bir hasta (%17,9) N sınıflamasına alındı. CRT sonrası MRG'de evrelenen 117 hastanın 27'sinde (%23) patolojik evrelemede aynı aşamada olunduğu doğrulandı (T ve N) . T0 ile 17 hasta, 5 hastada (%4,3) CRT sonrası MRG ile korele idi.

Sonuç: MRG preoperatif CRT sonrası lokal ileri rektum kanserinin yeniden evrelemesinde düşük bir hassasiyete sahiptir, bu nedenle klinik uygulama için yeterince tutarlı bir tetkik değildir.

Anahtar Kelimeler: MRG, neoadjuvan kemoradyoterapi, tahmin edilebilirlik

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Introduction

Colorectal cancer is the third most common malignancy worldwide. GLOBOCAN data base estimated over 37.229 new cases in 2020 and 16.838 rectal cancer associated deaths in Spain.[1] Neoadjuvant chemoradiotherapy (CRT) has become the standard of care for patients with locally advanced rectal cancer (LARC). The primary objective of CRT improves local control and resectability. It has been demonstrated that the final pathologic features at resection time remain the most important prognostic factors in the rectal cancer treatment. Other possibilities are the 'wait and see strategy' after CRT treatment in pathologic complete response (pCR) patients with high surgical risk or surgery refuse.

High-resolution pelvic magnetic resonance imaging (MRI) has assumed an important role in staging and in treatment decisions of rectal cancer. This is very important in the diagnostic accuracy of preoperative MRI in predicting circumferential resection margin (CRM) of rectal cancer.[2] The reported overall accuracy of MRI in predicting the pathologic stage of no irradiated rectal cancer is 71-91% (mean, 85%) for T classification,

43-85% (mean, 75%) for N classification, and 92-95% for CRM involvement.[3] Due to the therapeutic effect of preoperative CRT, 30-50% of the patients who had received preoperative CRT experienced down staging of the rectal tumor.[4] MRI is repeatedly performed for restaging and reassessment of CRM after preoperative CRT in LARC. The interpretation of post-CRT MRI in rectal cancer is not easy due to the post-radiation effect, the role of MRI in restaging rectal tumors after neoadjuvant CRT is not clear.[3] The efficacy of restaging MRI for predicting the pathologic stage in rectal cancer is controversial.[5,6]

Our purpose was evaluating MRI in post-neoadjuvant CRT treatment to predict pathologic stage for rectal cancer patients.

Materials And Methods

Patient Eligibility

Retrospectively we analyzed 117 patients with primary rectal cancer who had received preoperative CRT with 50,4 Gy in 28 fractions and concomitant fluoropyrimidine (capecitabine, 825 mg/m^2 twice daily or 5FU continuous infusion). All patients underwent total mesorectal excision, which was scheduled to take place 6-8 weeks after the CRT. The Ramón y Cajal University Hospital Institutional Review Board approved this study (protocol 228-16).

The eligibility criteria were: (i) histologically confirmed adenocarcinoma; (ii) lower, middle and higher tumor; (iii) IIA-IIIC stage determined by MRI and/or endorectal ultrasonography; (iv) no evidence of distant metastasis; and (v) complete radiotherapy treatment. The schedule of treatment included chemoradiotherapy with fluoropyrimidine concomitant with 50,4 Gy in 28 fractions. The patients with recurrent tumors, short course radiotherapy, and other chemotherapy schedule or radiotherapy incomplete treatment were excluded.

Evaluation

Clinical staging work-up included digital rectal examination, complete blood count, liver and renal function test, level of carcinoembryonic antigen and colonoscopy, chest and abdomen computed tomography (CT) and pelvic MRI before preoperative CRT.

The clinical target volume included the gross tumor volume and the presacral area, mesorectal area and internal iliac lymphnodes. Invaginaoranus involvement of external iliac and inguinal lymph nodes were included. The planning target volume was symmetrically generated with 2 cm around the macroscopic tumor.

Three-dimensionally planned conformal radiotherapy (3D-CRT) was planned for each patient. The radiation fields included one posterior field, -and two lateral fields.

Small bowel, bladder, and both femur heads were organs at risk. The constrains was in small bowel: V45<195 cc and V45<25%; bladder V50<60% and femur heads: V50<5%.

Pre-CRT MRI was performed for local tumor and nodal staging. The conventional rectal MRI protocol was done. Initially, precontrast T2-weighted sagittal, coronal, and axial images perpendicular to the long axis of the rectum were obtained. Each patient received an intravenous bolus injection of gadopentetate dimeglumine. Finally, postcontrast T1- weighted axial and sagittal images were obtained after 60s.

The depth of tumor infiltration on MRI was evaluated and staged as follows: 1) mrT1, tumor confined to the mucosa and submucosa; 2) mrT2, tumor invading the muscularis propia but confined to the rectal wall; 3) mrT3, tumor penetrating into the perirectal tissues without involvement of the surrounding organs; and 4) mrT4, tumor penetrating into surrounding organs. The short-axis diameter of lymph node of >5 mm observed on MRI was considered to be clinically positive.

In our analysis, using the same protocol for pre-CRT MRI performed post-CRT MRI before curative surgery 6 weeks after radiotherapy treatment. Images of post-CRT MRI were compared to those of pre-CRT MRI by a radiologist who had specialized in gastrointestinal radiology. Circumferential radial margin (CRM) on MRI was defined as an involvement when the tumor was 61 mm of the margin and radiologic regression grade.

Surgery and Pathology Review

All patients underwent surgery, which was scheduled 8 to12 weeks after the completion of radiotherapy. After curative surgery, post-CRT tumor stage was determined according to the TNM classification system recommended by the 7th edition of the American Joint Committee on Cancer criteria. Experienced colorectal pathologists, using the standardized method, evaluated pathologic specimens. Histologic grade, presence of lymph node metastasis, response to CRT, and circumferential and distal rectal margin were all evaluated. Downstaging rate was evaluated by comparing clinical and post-CRT pathological stages, and was defined as yp Stage 0-I (ypT0-2N0M0). Pathologically complete response (ypT0N0) was defined as the complete absence of viable tumor, and only fibrotic mass in the pathologic specimen. The pathologist used Ryan score to graderesponse to chemoradiotherapy.[7]

Statistical Analysis

The primary endpoint of the present study was to estimate the accuracy of MRI post-CRT as a predictor of pathologic stage. The secondary end-point was to assess the agreement between post-CRT MRI and pathologic staging in clinically down staged patients.

The grade of agreement of post-CRT MRI and pathologic staging was calculated with Cohen kappa concordance index. Concordance was considered poor for values between 0 and 0.20, fair for values between 0.21 and 0.40, moderate for values between 0.41 and 0.60, substantial or good for values between 0.61 and 0.80, and almost perfect or excellent for values more than 0.81. This study was designed to determine whether restaging MRI after CRT could predict the pathologic stage.

Results

One hundred seventeen patients with primary rectal cancer who had received chemoradiotherapy in Ramóny Cajal Hospital were evaluated.

We included patients who underwent restaging MRI at a median 5.9 (range, 2-12) weeks after the end of radiotherapy before surgery. One hundred eleven patients (95%) were restaged with MRI between 5-9 weeks, only 6 patients (5%) were restaged between 2-4 weeks (3p) or 10-12 weeks (3p). we did not find statistical differences between groups (p=0.91). They also received curative surgery at a median 83.5 days (range, 45-230) after the end of radiotherapy. The median age of the patients was 67.9 years (range, 41-85years). There were 74 men and 43 women. Pre-CRT MRI showed that 10 (8.55%) patients had cT2 lesions, 87 (74.3%) patients had cT3 lesions and 20 (17.15%) patients had cT4 lesions. At the time of diagnosis, 43 (36.75%) of the 117 patients had clinically node-positive disease. Ten patients could not receive complete prescribed doses of chemotherapy because of gastrointestinal toxicity (8p), dermal toxicity (1p) and hematological toxicity (1p). These patients received total doses of radiotherapy. We analyzed correlation between T and N stages in MRI and pathologic specimen and no significant difference (p=0.26) was found.

Accuracy of Restaging MRI After Preoperative CRT

Of the 117 patients, 52 (44.4%) achieved downstaging of T classification and 21 (17.9%) had down staging of N classification. Table 1 shows the comparison between post-CRT MRI and postoperative pathologic T and N classifications. The findings in 44 (37.6%) of 117 patients agreed in post-CRT MRI and pathologic T classification, and the concordance degree was low (k=0.1).

Table 1. Summarizes the sensitivity, specificity, positive predictive value, and negative predictive value of restaging MRI according to the ycT and ycN classifications

	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
ycT0	5/21 (23.8%)	84/96 (87.5%)	5/17 (29.4%)	84/100 (84%)
ycT1	1/6 (16.67%)	104/111 (93.7%)	1/8 (12.5%)	104/109 (95.4%)
ycT2	10/39 (25.64%)	62/78 (79.5%)	10/26 (38.46%)	62/91 (68.1%)
ycT3	22/45 (48.89%)	46/72 (63.9%)	22/48 (45.8%)	46/69 (66.7%)
ycT4	5/6(83.34%)	98/111 (88.3%)	5/18 (27.78%)	98/99 (99%)
ycN0	68/83 (81.9%)	15/34(44.11%)	68/87 (78.16%)	15/30 (50%)
ycN1	5/25 (20%)	81/92 (88%)	5/16 (31.25%)	81/101 (80.2%)
ycN2	0/9 (0%)	94/108 (87%)	0/14 (0%)	94/103 (91.3%)

MRI: Magnetic resonance imaging, PPV: Positive predictive value, NPV: Negative predictive value

Compared with the pathologic T classification, 21 (18%) of 117 patients were over staged and 52 (44.4%) of 117 patients were under staged in post-CRT MRI. Findings from post-CRT MRI and pathologic N classification agreed in 73 (62.4%) of 117 cases, and the concordance degree was moderate (k=0.3). Compared with pathological N classification, 21 (16.9%) and 23 (19.65%) of 117 patients were over staged and under staged in post-CRT MRI, respectively. Over staging of T and N classifications was more common than under staging. Of the 117 patients, 27 patients (23%) achieved correlation between MRI and pathologic classification, 60 patients (51.3%) was over staged with MRI and 30 patients (25.7%) were under staged with MRI.

Prediction of Pathologic Downstaging Using MRI After CRT

Time to MRI and surgical resection was in 2 to 6 weeks in 92p (78,6%), only in 25p was between 7-42 weeks (11p in seven week). We analyzed correlation between T and N stage in MRI and pathologic specimen and time between MRI and surgery and no significant difference (p=0.89) was found.

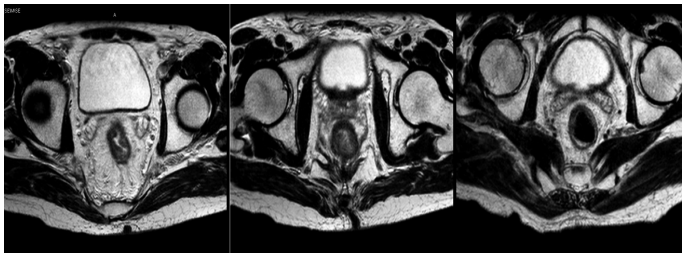

Figure 1. The images shows patient with rmT2N0 and after 2 weeks ypT0N0 in pathologic specimen

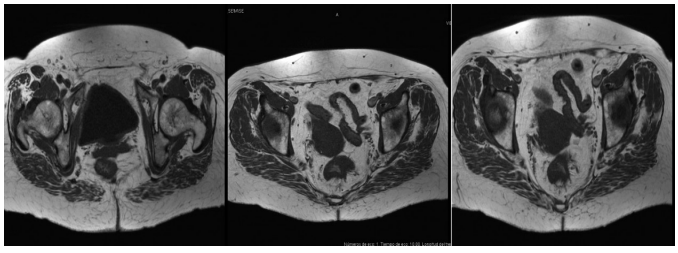

Figure 2. The images shows patient with rmT4N0 and after 2 weeks ypT4N0 in pathologic specimen

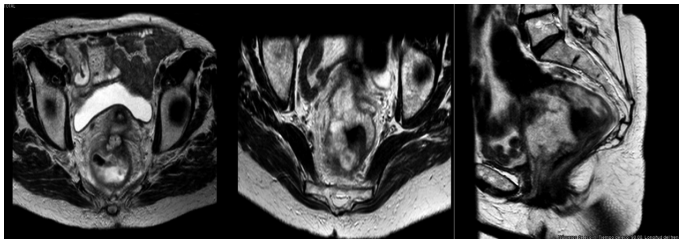

Figure 3. The images shows patient with rmT0N0 and after 2 weeks ypT3N1 in pathologic specimen

Of the 117patients, 74 (63.24%) achieved down staging of a rectal tumor and 17 (14.5%) had a pathologically complete response (ypT0N0). Of 47 patients who achieved downstaging on MRI after CRT, 27 (23%) actually were down staged on the pathologic specimen. Twenty seven (23%) of 117 patients displayed the same findings in post CRT MRI and pathologic staging, and the concordance degree was low. Twenty (17.1%) of 117 patients were under staged on post-CRT MRI as compared with pathologic staging. In Figures 1, 2 and 3 we showed MRI imaging examples.

Sensitivity in T0, T1, T2, T3 and T4 was 23.8%, 16.7%, 25.6%, 48.9% and 83.3% respectively. Specificity in T0, T1, T2, T3 and T4 were 87.5%, 93.7%, 79.5%, and 64% and 88.3% respectively. Sensitivity in N0 and N1 were 82% and 20% respectively. Specificity was 88% in N0 and 87% in N1.

Discussion

Neoadjuvant CRT improves resectability of LARC.[5,6] The macroscopic evaluation of disease becomes difficult to differentiate fibrosis or tumor. These items combined with the limited ability of preoperative imaging to stage both the T and N categories, render conventional tumor-node and metastasis (TNM) staging of limited value as a method to evaluate a tumor response. Pateletal[8] assessed the importance of MRI detected tumor response to neoadjuvant CRT on survival outcomes in LARC. Patients deemed to have a poor response (mriT3b-T4) , had a 5 year overall survival of 27% versus 72% for good responders. Preoperative residual tumor evaluation is important for performing minimally invasive surgery such as sphincter preservation; an accurate non-invasive diagnostic image-based approach has been sought.

Guidelines recommend that patients with LARC and neoadjuvant treatment should undergo surgery in 6-8 weeks (ESMO)[9] or 5-12 weeks (NCCN)[10] after completion of long-course chemoradiotherapy or within 7-10 days of completion of short-course radiotherapy. However, the better interval between chemoradiotherapy and surgery has long been a subject of investigation. In our study timing after chemoradiotherapy to surgery was 8-12 weeks.

Timing to MRI after chemoradiotherapy is uncertain. A prospective clinical trial is currently ongoing that investigates the feasibility of adopting a nonoperative management strategy for patients with LARC who are selected based on the degree of mrTRG between 8 and 12 weeks after completion of neoadjuvant chemoradiotherapy.[11] In our study median evaluation with MRI was in 5.9 weeks. This timing may affect the results of this study.

MRI accuracy is poor after rectal CRT. Because it is difficult to differentiate tumor cells in fibrosis tissue.[12,13,14,15] Post

CRT MRI is a poor predictor of final histology and should not be relied upon to guide the extent of surgical resection. Larsen et al.[15] felt that to achieve R0 resection, optimal surgery should be based on pre-treatment MRI. The study has initiated a new approach to pathological classification of the removed specimen where they introduce a MRI assisted technique for investigating the areas at risk outside the mesorectal fascia in the specimen.[15] Kang et al.[16] concluded that the tumor volume reduction ratio was not significantly associated with T and N downstaging. Our study demonstrates that MRI is unable to detect the majority of patients who have a complete pathological response. Similar to our study, other studies demonstrate that there are low agreement on the use of MRI after long-course radiotherapy.[17] Martellucci et al.[18] suggested against restaging with MRI and recommended transrectal ultrasound (TRUS). They found that regarding the depth of invasion after treatment, TRUS agreed with pathology in 67.5%, CT agreed 59.5 %, and MRI in 60%. They therefore suggest limiting the use of MRI for restaging to selected cases similar to our study. A systematic search was performed by Saklani et al.[19] evaluated the role of MRI in rectal cancer surgery with 72 articles analyzed. They concluded that MRI post chemoradiotherapy for rectal cancer remains controversial, but it is necessary to planning radical surgery improves R0 resection rates and decreases local recurrences. Lee et al.[20] analyzed 150 patients, restaging MRI has low accuracy for the prediction of the pathologic T and N classifications in rectal cancer patients similar to our study. Maretto et al.[21] analyzed 46 patients classified with proctoscopy, TRUS, and CT scan and MRI. Findings were compared with the pathologic TNM stage. They concluded that all rectal cancer staging modalities after CRT allows good prediction of node-negative cases, although none of them is able to predict the pCR on the rectal wall.

However, using high-resolution MRI, standardizing image acquisition techniques and interpretation of images, comparative evaluation of pre and post CRT MRI images, adding diffusion-weighted imaging (DWI) to the standard approach, and importantly, experience and awareness of the limitations can improve diagnostic accuracy of MRI for re-staging. Functional MRI techniques allow for the quantification of tumor biological processes, such as microcirculation, vascular permeability, and tissue cellularity. This new technology has begun to show potential advantages over standard morphologic imaging in the restaging of rectal cancer, allowing for more accurate prognostication of response and potentially introducing an earlier treatment alteration and more accurate non-invasive surveillance, which could improve patient outcomes.[22] Our study included DWI but there was not increased concordance between pathologie and post treatment MRI staging lymph nodes (LN) evaluation is not clear. Ryu et al.[23] evaluated the added value of DWI in the evaluation of LN eradication after CRT in patients with LARC. Pathological reports served as the reference standards for LN eradication. They concluded that adding DWI to T2W imaging provided no additional diagnostic benefit for the evaluation of LN eradication following CRT in patients with LARC.[23] Results of a meta-analysis showed that none of the three commonly used imaging modalities used in rectal cancer can provide reliable evaluation on regional LN metastasis. Perhaps we should conduct further research on specific contrast agents or functional imaging to try and improve the accuracy. The data available, however, indicate that MRI is more accurate than endoscopic ultrasound particularly for evaluating LN metastasis after neoadjuvant therapy. MRI at a high field-strength improves the diagnostic accuracy for LN evaluation.[24] In our serie MRI in LN had more concordance than tumor invasion probably because of using all sequences of MRI including DWI.

Recent studies have reported that changes in 18F-FDG uptake before and after CRT could differentiate responders from non-responders and predict the patient's outcome.[25,26] However, 18F-FDG uptakes have been reported to be nonspecific for malignant tumors, particularly in post-CRT rectal cancers, because of radiation-induced inflammation and physiological bowel uptake,[27,28,29] for this problem in our center don't use routinely PET (positron emission tomography)/CT to restaging patients with rectal tumor after chemoradiotherapy. Choi et al.[30] analyzed PET/CT exhibited better accuracy in diagnosing tumor response. Fischer et al.[31] in a prospective study showed an excellent diagnostic accuracy for prediction of pathological response. Leccisotti et al.[32] showed the ability of early metabolic response assessment using PET/CT to predict non-cPR in patients with LARC. But in a systematic review, a total of 14 publications on DWI and 25 on PET/CT demonstrate that both imaging modalities have a low positive predictive value in the prediction of pCR. A study with 17 patients confirmed the predictive power of tumor segmentation based on PET/CT imaging for response evaluation in patients with rectal cancer after neoadjuvant CRT therapy.[33] The major strength of DWI and PET/CT lies in the identification of non-responders who are not candidates for organ preservation. Up to now, DWI and PET/CT are not accurate enough to safely select patients for organ-sparing strategies. Although few data are available, early changes in FDG-uptake seem promising in the prediction of pCR and the role of PET/CT during CRT should be further investigated. Future research must focus on the integration of functional imaging with clinical data and molecular biomarkers.[34] Future advances

in the radiological imaging and biological detection might help in accurately correlating the presence of pCR but, nowadays, no optimal selection criteria for pCR are available. Furthermore, as recently highlighted in asystematic review, the rationale of a *wait and see* policy after complete response relies mainly on retrospective observations from only one centre in Brazil.[35] Maggiori et al.[36] showed that the overall morbidity rate was similar between pCR and non-pCR groups of patients. However, both the severe morbidity and infection related morbidity rates were less in pCR group. The results proposed that the greater postoperative complication rates for patients with major pathologic response group significantly contribute to a poor prognosis and may cut the oncological benefits of the neoadjuvant CRT. Other studies described no difference in the frequency of overall operative complications between pCR and non-pCR groups.

It is not easy to predict pathologic stage solely with simple MRI. There are some reports that PET/CT and functional MRI or imaging biomarkers may be helpful in the prediction and assessment of tumor response to CRT. Awareness of tumor volume and metabolic change helps physicians to achieve appropriate restaging of irradiated rectal cancer with MRI and can lead to a reduction in under staging or over staging.

Study Limitations

Limitations of study included the inclusion of 10 patients with reduce doses of chemotherapy; this item could be a confusion factor. Difference between timing to MRI after chemoradiotherapy treatment could be confusion factor and could be pretty long for evaluation and explain or results. We need more prospective studies to evaluate utility of MRI in re-evaluation after neoadjuvant treatment of LARC.

Conclusion

In conclusion, for rectal cancer patients who have received preoperative CRT, restaging MRI has low accuracy in the prediction of the pathologic T and moderate in the prediction of pathologic N classifications mainly due to under staging. For patients who achieved clinical downstaging on MRI after CRT, the diagnostic accuracy was relatively low in our analysis. In this topic, future well-designed prospective trials will be needed to verify our results with better MRI techniques or imaging biomarkers.

Ethics

Ethics Committee Approval: The Ramón y Cajal University Hospital Institutional Review Board approved this study (protocol 228-16).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: C.d.l.P., M.M., C.S., A.H., E.F.l., F.L., S.S., Concept: C.d.l.P., M.M., C.S., A.H., E.F.l., F.L., S.S., Design: C.d.l.P., M.M., C.S., A.H., E.F.l., F.L., S.S., Data Collection or Processing: C.d.l.P., M.M., C.S., A.H., E.F.l., F.L., S.S., Analysis or Interpretation: C.d.l.P., M.M., C.S., A.H., E.F.l., F.L., S.S., Literature Search: C.d.l.P., M.M., C.S., A.H., E.F.l., F.L., S.S., Writing: C.d.l.P., M.M., C.S., A.H., E.F.l., F.L., S.S.

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RESEARCH ARTICLE

Laparoscopic Resection of Primary Tumor with Synchronous Conventional Resection of Liver Metastases in Patients with Stage 4 Colorectal Cancer: A Retrospective Analysis

Evre 4 Kolorektal Kanserli Hastalarda Primer Tümörün Laparoskopik, Karaciğer Metastazlarının Konvansiyonel Olarak Senkron Rezeksiyonu: Retrospektif bir Analiz

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ABSTRACT

Aim: Aim of this study is to analyze the short and long term results of laparoscopic colorectal cancer resection with synchronous conventional resection of liver metastasis.

Method: All cases operated on synchronous colorectal cancer and liver metastasis between 2009 and 2017 were retrospectively retrieved from a prospective database. Three and more liver segment resection was considered as major resection. Demographics, patient characteristics, operative and postoperative findings and survival were analyzed.

Results: A total of 35 patients [23 (65.7%) male, median age: 56 (34-79)] was included to the study. The most common primary tumor localization was rectum (n=20, 57.1%). Neoadjuvant chemoradiotherapy and chemotherapy was applied in 15 (75%) and 14 (40%) cases, respectively. Major, minor resection or only ablative therapy performance was 12 (34.3%), 19 (54.3%) and 4 (11.4%), respectively, but 13 (37.1%) cases received both resection and ablative therapy. Mean operation time was 307.8±103.6 minutes and estimated blood loss was 300 (10-2200) cc. Blood transfusion was needed in 15 (42.9%) cases. Length of stay was 7 (4-17) days. Eleven complications developed in 10 (28.6%) cases, but none required re-operation. A patient (2.9%) underwent laparoscopic low anterior resection with major hepatectomy and radiofrequency ablation was deceased in postoperative 11th day due to liver failure and subsequent multiorgan failure. Three, 5, 7 and 9-year survival rates was 63%, 35%, 35%, and 35%.

Conclusion: Laparoscopic colorectal resection with synchronous conventional liver resection in patients with metastatic colorectal cancer is safe and feasible. Long term survival rates are acceptable.

Keywords: Laparoscopy, liver metastasis, colorectal cancer, synchronous tumor

ÖZ

Amaç: Bu çalışmanın amacı karaciğer metastazlı kolorektal kanserli kolorektal tümörün laparoskopik, karaciğer metastaz cerrahisinin ise açık yöntemle tamamlandığı hastalarda kısa ve uzun dönem sonuçları irdelemektir.

Yöntem: Prospektif olarak bilgi girişi yapılan bir veri bankasından 2009-2017 yılları arasında senkron metastaz cerrahisi uygulanan ve laparoskopik kolorektal rezeksiyon yapılan hastalar derlendi. ≥3 segment rezeksiyonu majör rezeksiyon olarak nitelendirildi. Demografi ve hastalara ait verilerle, ameliyat ve ameliyat sonrası bilgiler ve sağkalım incelendi.

Bulgular: Otuz beş hasta [23 (%65,7) erkek, ortanca 56,0 (34-79) yaş] bulundu. En sık yerleşim yeri rektumdu (n=20, %57,1). Neoadjuvant kemoradyoterapi ve/veya kemoterapi alan olgu sayısı 15 (%75) ve 14 (%40) idi. Majör, minör rezeksiyon veya sadece ablasyon uygulaması sırasıyla 12 (%34,3), 19 (%54,3) ve 4 (%11,4) hastada yapıldı. Ayrıca 13 (%37,1) hastaya hem rezeksiyon ve hem de ablasyon uygulandı. Ortalama operasyon

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süresi 307,8±103,6 dakikaydı ve kan kaybı miktarı 300 (10-2200) cc idi. On beş (%42,9) hastada kan transfüzyonu gerekti. Hastalar 7 (4-17) günde taburcu edildiler. Toplam 10 (%28,6) hastada en az bir, toplamda ise 11 komplikasyon gelişti. Hiçbir hastaya bu komplikasyonlara bağlı re-operasyon gerekmedi. Laparoskopik aşağı anterior rezeksiyon, majör hepatektomi ve radyofrekans ablasyon uygulanan bir olgu (%2,9) operasyondan 11 gün sonra karaciğer yetmezliğine ikincil gelişen çoklu organ yetmezliğine bağlı olarak kaybedildi. Hastalarda 3, 5, 7 ve 9 yıllık sağkalım oranları %63, %35, %35 ve %35 idi.

Sonuç: Karaciğer metastazlı kolorektal kanserlerde, kolorektal kanserin laparoskopik, karaciğer metastaz cerrahisinin ise açık yöntemle uygulanabilir ve güvenilir bir yöntemdir. Uzun dönem sağkalım kabul edilebilir sınırlardadır.

Anahtar Kelimeler: Laparoskopi, karaciğer metastaz, kolorektal kanser, senkron tümör

Introduction

Colorectal cancer (CRC) is one of the major causes of malignancy-related deaths and approximately one million people are diagnosed with CRC every year in Western societies.[1] Approximately 15-25% of these patients have synchronous liver metastasis at the time of diagnosis and the potential curing is the radical resection of the primary tumor and liver metastasis.[2] The most appropriate treatment strategy for CRC patients presenting with liver metastasis is controversial and many factors, including the burden of disease and the general condition of the patient, influence the decision of treatment.[3] Although synchronous removal of primary and hepatic tumors has the potential to increase the likelihood of complications and mortality, some studies have shown that combined applications are safe and effective even if major hepatectomies are administered.[4,5,6]

Numerous prospective randomized studies have shown that laparoscopic surgery for CRCs is safe.[7,8] Although multi-institutional studies have shown that minimally invasive methods can be used in liver metastasis surgery, the results of the only prospective randomized study initiated in this regard have not been established yet.[9,10] On the other hand, it is not known whether laparoscopic resection of primary tumor is advantageous when liver metastasis is conventionally removed. A study of 40 patients with comparative cases has shown that laparoscopic technique may provide an advantage in blood loss and return of bowel movements.[11] This study concludes that this issue should be examined in more detail. The aim of this study is to retrospectively examine the patients who underwent simultaneous liver metastasectomy during laparoscopic CRC resection.

Materials and Methods

All patients included in the study were retrospectively collected from a database that had been prospectively entered since 2002. This database includes patients who were operated at Kartal Training and Research Hospital General Surgery Clinic between 2002-2012 and at İstanbul Medipol University, General Surgery Department, Colorectal&Oncology Surgery Department after 2012 by a single surgeon (MO) in İstanbul Medipol University, General Surgery Department, Colorectal&Oncology Surgery Department. Since 2013, liver surgery has been performed by another team that works specifically for hepatobiliary surgery. Prior to compiling the data, the İstanbul Medipol University Ethics Committee (10840098-604.01.01-E.47598) approved the study. All patients with metastatic CRC who were operated on synchronously were included in the study. During the data collection, the following cases were excluded: only those treated for metastasis (including those who were operated progressively, including the "liver first" approach), both the primary tumor and the metastasis were operated by open or laparoscopic techniques, and the primary tumor was operated by a robot-assisted operation, patients with recurrent CRC associated with liver metastasis, and carcinomatosis or other reasons, and who did not undergo curative treatment for CRC and/or liver metastasis.

Preoperative

Evaluation and decision-making in all patients were performed in a multidisciplinary council. Local staging was performed with abdominal computed tomography (CT) for colon cancer and magnetic resonance imaging (MRI) for rectal cancers. Metastatic investigations were performed with upper abdominal MRI, lung CT and positron emission scintigraphy/CT. Neoadjuvant radiotherapy was applied in patients with T3-4 and/or node positive middle-lower rectal cancer. Neoadjuvant chemotherapy decision was given in some patients with the decision of multidisciplinary council, especially in cases with higher liver tumor burden. These patients were re-staged after a metastatic chemotherapy regimen.

Surgical Technique

All patients underwent surgery beginning with CRC. The operation was completed with total mesorectal excision in rectal tumors, complete mesocolic excision in colon tumors (since 2012 in the right colon), high ligation of the vessel(s) and paying attention to the integrity of the specimen. In patients undergoing inferoanterior or low anterior resection, the most appropriate incision was made for liver surgery after stapler firing. Mobilization of splenic flexure and removal of the specimen from the abdomen were

completed by this incision. The anastomosis was completed intracorporally after re-insufflation of the abdomen and under direct observation from the incision in some anterior resection patients. In the right colon tumors, the incision was used to take out of the specimen as well as the extracorporeal ileo-colonic anastomosis.

Before the resection, an experienced radiologist reevaluated the liver by intraoperative ultrasound and the operation plan was changed if there was a different finding according to the preoperative data. The same expert performed the ablative procedure (radiofrequency or microwave) with the aid of intraoperative ultrasound radiofrequency or microwave. Liver resection was performed using Habip® 4X device (AngioDynamics, Latham, NY) (mostly before 2012) or by conventional methods. If necessary, the surgical margin was evaluated with frozen section. Pringle maneuver was performed in both techniques when necessary. Postoperative care was not different from standard CRC surgery. After pathological examination, all patients were re-evaluated in the multidisciplinary council for the next treatment/follow-up approach.

Statistical Analysis

Patient and disease-related variables (demographic information, presence of previous abdominal surgery, comorbidity, American Anesthesia Association (ASA) score, tumor localization, lung metastasis in addition to the liver), whether or not received neoadjuvant chemotherapy and/or radiotherapy, data on the operation and pathology (type of operation for CRC, type of incision, need for conversion, if necessary, number of liver metastases, maximum metastasis size, type of liver resection, ablation procedure, amount of bleeding, necessity of blood replacement during and/or after the operation, additional organ resection, tumor grade, T and N stage, the number of harvested lymph nodes, the number of positive lymph nodes, presence of vascular and perineural invasion), post-operative process (complications, hospitalization duration of stay, 30-day mortality) and survival. Tumors at a distance of ≤15 cm from the dentate line were accepted as rectum tumors, and tumors at ≤12 cm distance were accepted as middle-lower rectal cancers. Resections larger than 3 segments in the liver were called major resection. Data were reported as mean (standard deviation) or median (range), rates were reported with percentages. Survival was analyzed with Kaplan-Meier test.

Results

Thirty-five patients [23 (% 65,7) male, median age: 56,0 (34-79)] whose primary tumor was operated on by laparoscopic and metastasis by open method, synchronously between the years of 2009-2017 were examined. Ten (28.6%) patients had previous abdominal incisions [McBurney (n=7, 22.9%), subcostal (n=2, 5.7%) and Pfannelstiel (n=1, 2.9%)] of 10 patients (28.6%) had previous operations.]) Thirteen (37.1%) patients had comorbidity [hypertension (n=9, 25.7%), type II diabetes mellitus [n=7, 20.0%], coronary artery disease (n=4, 11%, 4), congestive heart failure (n=2, 5.7%) and previous malignancy (n=1, 2.9%)]. The distribution of the patients according to ASA score was as follows: 1 (n=11, 31.4%), 2 (n=17, 48.6%) and 3 (n=7, 20%).

Table 1. Surgical procedures for local and liver metastasis with primary tumor localization

Primary tumor localization	Primary tumor surgery	Major/minor*	Liver resection	Ablation of the liver
Cecum (n=4, 11.4%)	Right hemicolectomy (n=3) Extended right hemicolectomy (n=1)	0/3 (75.0 %)	Metastasectomy (n=3)	n=1
Ascending colon (n=1, 2.9%)	Right hemicolectomy	1 (100%)/0	Segmentectomy (n=3)	None
Transverse colon (n=2, 5.7%)	Extended right hemicolectomy (n=3)	1 (50.0%)/1 (50.0%)	Segmentectomy (n=3) Metastasectomy (n=1)	n=2
Splenic flexure (n=1, 2.9%)		1 (%100)/0	Segmentectomy (n=3) Metastasectomy (n=3)	None
Sigmoid colon (n=5, 14.3%)	Anterior resection (n=7)	2 (40.0%)/3 (60.0%)	Segmentectomy (n=14) Metastazektomi (n=2)	n=3
Rectosigmoid (n=2, 5,7%)		1 (50.0%)/1 (50.0%)	Segmentectomy (n=4) Metastasectomy (n=2)	n=1
Rectum (n=20, 57.1%)	Low anterior resection (n=17) Hartmann (n=1) Abdominoperineal resection (n=2)	6 (30.0%)/12 (60.0%)	Segmentectomy (n=24) Metastasectomy (n=1)	n=8

(*Resections more than three segments are classified as major and less are classified as minor)

The most common location was rectum (n=20, 57.1%). Fifteen (75%) patients with rectal cancer received neoadjuvant short-term radiotherapy. Preoperative chemotherapy was given to 14 patients (40%) due to liver tumor burden. The localization of primary disease, techniques applied to these sites, accompanying liver surgical resection procedure and ablation procedures are presented in Table 1. In total, 12 (34.3%) patients underwent major resection, 20 (57.1%) patients underwent minor resection, and 3 (8.6%) underwent only ablation. In addition, 13 (37.1%) patients underwent both resection and ablation at the same session.

None of the patients required additional trocar application during laparoscopy. The incisions that were planned for liver resection were: subcostal (n=31, 88.6%), chevron (n=3, 8.6%), midline and transverse (n=1, 2.9%). One patient (2.9%) converted to open surgery because of lack of exploration due to intestinal dilatation. Median 1 (1-4) additional liver metastases were detected in patients after ultrasonography (USG) and the largest metastasis length was 2 cm. Two patients (5.7%) required additional organ resection (ovary in 1 patient and abdominal wall in 1 patient). The mean (± standard deviation) operation time was 307.8±103.6 minutes and the median (range) blood loss amount was 300 (10-2200) cc. Fifteen (42.9%) patients required blood transfusion during perioperative period. The patients were discharged on median (range) 7 (4-17) days. In 2 (5.7%) patients, lung metastasis was present in addition to the liver and these metastases were operated on at subsequent surgery (s). At least one complication occurred in total 10 (28.6%) patients and 11 complications in total (Table 2). No patient required re-operation due to these complications. One case (2.9%) who underwent laparoscopic low anterior resection, major hepatectomy and radiofrequency ablation died due to multiple organ failure secondary to liver failure 11 days after the operation. The results of the pathological examinations of the extracted specimens are presented in Table 3. Surgical margin positivity was not observed in CRC resections, but in 3 (8.6%) patients at liver resection site. Overall survival in patients is presented in Figure 2.

Table 2. Complications after surgery

Complications*	
Surgical site infection	3 (8.6)
Wound infection	3 (8.6)
Abdominal abscess	1 (2.9)
Anastomotic leakage**	1 (3.2)
Urinary retention	1 (2.9)
Non-surgical complications	3 (8.9)
Bile fistula	1 (2.9)
Biliary stasis	1 (2.9)
Total patient*	10 (28.6)

*Since more than one complication is seen in some cases, the number of complications is higher than the number of patients with complications.

**Patients who underwent Hartman procedure and abdominoperineal resection were excluded, and only cases with anastomosis were considered.

Table 3. Pathological examination results

Variables	Results
T stage (T1/T2/T3/T4)	1 (%2.9)/3 (%8.6)/26 (%74.3)/5 (%14.3)
N stage (N0/N1/N2)	11 (%31.4)/14 (%40.0)/10 (%28.6)
Harvested lymph node	21 (2-70)
Malignant lymph node	2 (0-13)
Differentiation (poor/moderate/well/unknown)	2 (5.7%)/12 (34.3%)/20 (57.1%)/1 (2.9%)
The presence of vascular invasion	13 (37.1%)
The presence of perineural invasion	19 (54.3%)

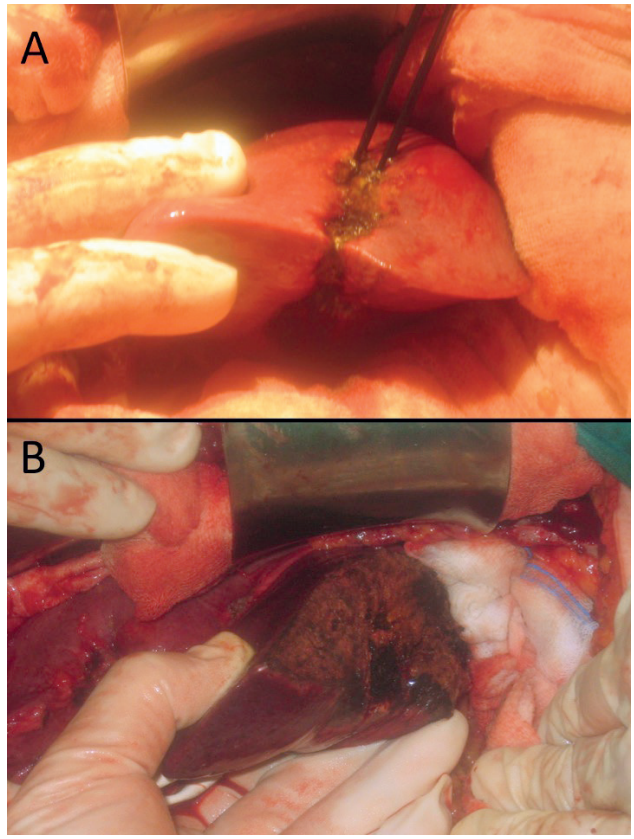

Figure 1. Liver segment 2 and 3 resection (A), and view after resection (B)

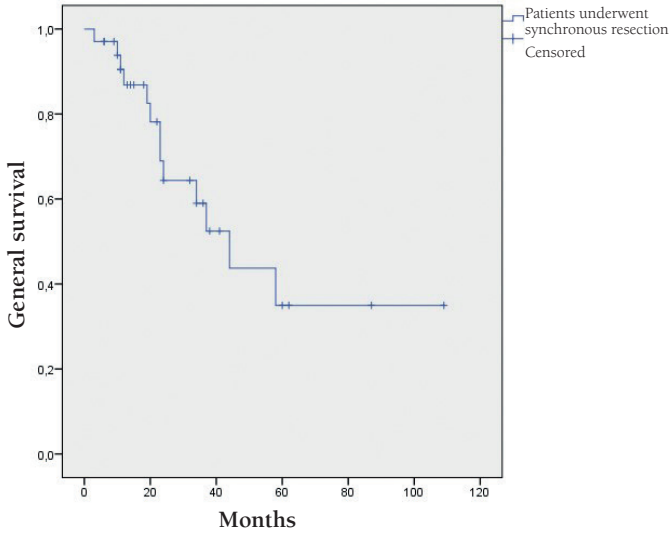

Figure 2. Kaplan-Meier analysis shows that survival rates of 3, 5, 7 and 9 years in colorectal cancer patients who were applied synchronous liver metastasectomy were 63%, 35%, 35% and 35%

Discussion

In CRCs, they may present as metastatic at the time of diagnosis. Surgical resection can be considered as an option even in patients with liver and/or lung metastases. In this study, we present cases in which combined liver metastasis surgery and colorectal surgery are obtained from a single database. Many studies have shown that such synchronous procedures are feasible and safe.[12,13,14] A systemic review examining the same subject highlights the fact that even the major hepatectomies can be safely performed in synchronous procedures with appropriate patient selection competent surgical technique.[3] The main difference of the present study is that the colorectal procedure is performed laparoscopically. In these patients, especially if the primary tumor is localized to the lower abdominal quadrants, performing laparoscopic surgery may provide a theoretical benefit as it reduces the incision size. However, there is no comparative analysis of colorectal surgery by laparoscopic or open method. In a similar study, Akiyoshi et al.[12] published a series of 10 cases in which the sigmoid or rectum was removed by laparoscopy and synchronous liver resection by open method and argued that this method was feasible and safe. In another study, Bretagnol et al.[13] presented a series of large surgeries including right hemicolectomy in 7 cases. After laparoscopic surgery, it is possible to complete liver surgery by laparoscopic method. Retrospective analysis of laparoscopic or open surgery reveals that the early standard advantages (reduction of blood loss, early onset of bowel movements) of laparoscopy also apply to this type of surgery.[1,11,14] However, intraoperative USG is more difficult to perform in laparoscopic procedures in liver metastases. On the other hand, intraoperative USG is an important examination for the detection of new lesions and the importance of ablation therapy. In a study done in our group, intraoperative USG changed the operation strategy in some of the patients.[15] Due to this restriction, according to our thoughts and clinical approach, laparoscopic liver metastasis surgery should not be performed without seeing the results of the ongoing prospective randomized study.[10] The fact that the patients presented in the study were mostly sigmoid and rectal cancer increases the importance of laparoscopic colorectal surgery in these cases. Because it is possible to reach both the primary lesion and the liver with a relatively short incision in a tumor located in the ascending colon, more distal tumors require longer or even separate incisions. In our opinion, this approach is most useful in patients with sigmoid or rectum primary. Decrease in incision length may be a step to perform more major procedures in the liver, as there are such cases in this series. Laparoscopic removal of CRC may affect intraoperative and early postoperative outcomes in these patients positively or negatively. One study showed that total laparoscopic procedure significantly prolonged operation time compared to open surgery.[1] Since there is no comparative analysis, there is no clear data on this subject, but the shortening of the abdominal incision can keep this time in a reasonable way by eliminating the time taken for the opening and closing of the abdomen. As a matter of fact, the operation time in the series presented is similar to the time of open surgery in the literature.[1] In the recent study, there was no conversion to open surgery. This also shortens the length of hospital stay. Median hospital stay in this study was 7 days. Complication rates of up to 50% in synchronous procedures are reported.[11,14] In the presented series, this rate was reasonable, below 30% and did not require reoperation. The only mortality in the series was due to liver failure. Finally, Kaplan-Meier analysis shows that long-term survival in patients is acceptable and comparable to the literature.[1,3] These findings suggest that open liver procedures accompanying laparoscopic colorectal surgery are feasible and safe.

One of the points underlined in this study is the importance of multidisciplinary approach in the presence of cancer, especially metastatic disease. In all patients presented in this study, the decision of surgery was taken in multidisciplinary councils with the significance of the literature.[1,3,12] Similarly, all of the colorectal procedures and the majority of surgical procedures for the liver were applied by surgeons who were specific in these subjects. In all cases, intraoperative USG and ablation procedures were completed by experienced radiology teams.

The study had specific limitations. The main problem is the retrospective data collection and the single-arm study design. On the other hand, the inclusion of both right colon

and sigmoid and even rectal cancers leads to a heterogeneity between the data. Lastly, the inclusion of cases over a long period time has led to many different applications, especially oncological treatment options. On the other hand, the fact that a single colorectal team manages the series and the number of patients is significantly higher compared to similar studies in the literature still makes the study valuable.

In summary, this retrospective analysis shows that laparoscopic CRC surgery and open liver surgery can be performed in CRCs with liver metastatis. This method is a reliable method since it can reveal advantages in terms of early postoperative results. Long-term results are acceptable.

All procedures applied to people in the study comply with the ethical standards of institutional and national research boards, the 1964 Declaration of Helsinki and the ameliorative principles published thereafter. No written approval is required in such studies.

Ethics

Ethics Committee Approval: The study was approved by the İstanbul Medipol University Ethics Committee (approval number: 10840098-604.01.01-E.47598).

Informed Consent: Retrospective study.

Peer-review: Externally peer-reviewed.

Authoring Contributions

Surgical and Medical Application: M.O., Concept: N.O., M.O., Design: M.H., M.O., Data Collection or Processing: N.O., M.H., Analysis or Interpretation: N.O., M.H., M.O., Literature Search: M.H., M.O., Written: N.O., M.O.

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CASE REPORT

Intussusception Caused by an Appendiceal Mucocele: Case Report

Appendiks Mukoseline Bağlı Intussusepsiyon: Olgu Sunumu

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ABSTRACT

Intussusception of the appendix in to the caecum caused by an appendiceal mucocele is a rarecondition. Acute appendicitis is the most common presentation is of the disease. Radiologic examination methods especially computed tomography can be useful for preoperative diagnosis. If a mucocele is more than 2 cm in size or caused intessuception, right hemicolectomy should be considered.
Keywords: Appendix, mucocele, intussuception

ÖZ

Appendiks mukoseli nedeniyle gelişen appendiksin çekuma intussusepsiyonu oldukça nadirdir. En sık akut apandisit kliniği ile ortaya çıkar. Ameliyat öncesi dönemde tanı görüntüleme yöntemleri ile özellikle de bilgisayarlı tomografi ile konulabilmektedir. Appendiks mukoselinin çapı 2 cm'yi aştığı durumlarda veya intussusepsiyon bulunması durumunda sağ hemikolektomi önerilmektedir.
Anahtar Kelimeler: Appendiks, mukosel, intussusepsiyon

Introduction

Appendiceal cecal intussusception is rare and occurs in about 0.01% of patients undergoing appendectomy[1]. Appendiceal intussusceptions may develop due to foreign bodies, lymphoid hyperplasia, polyps, neoplasia and endometriosis[2]. Intussusception due to appendiceal mucocele is quite rare. We aimed to present a case who presented with acute appendicitis and was found to have cecal intussusception due to appendiceal mucocele in preoperative imaging methods.

Case Report

A 47-year-old male patient presented to our hospital with a complaint of abdominal pain that started 3 days ago. Physical examination revealed tenderness and defense in the right lower quadrant. In the laboratory parameters, the leukocyte count was $13.5\times10^3/\mu L$ (95% neutrophil). Other biochemical markers were normal. Ultrasonography revealed a pathological mass in the right lower quadrant of the abdomen. On computed tomography, appendiceal mucocele with a 15 cm length and diameter of 5.2 cm was found to cause intestinal intussusception (Figure 1). The patient was taken to the operation and exploration led to the right hemicolectomy because the tumor extended to the base of the appendix and caused intussusception in the cecum (Figure 2). On postoperative day 7, the patient was discharged uneventfully. Histopathological examination revealed low grade mucinous neoplasm.

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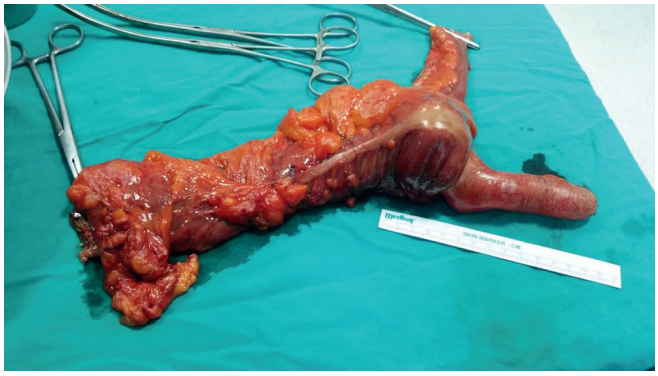

Figure 1. Right hemicolectomy line

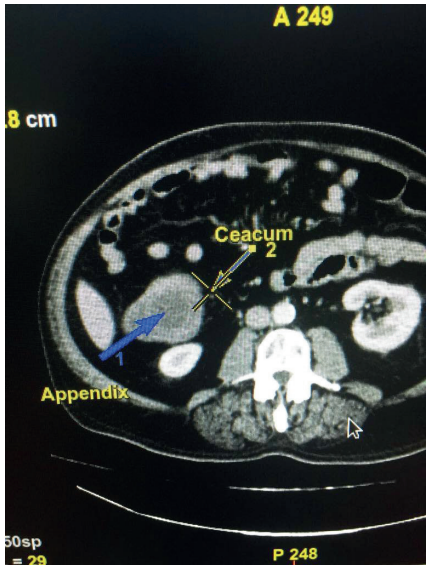

Figure 2. Appendiceal mucocele leading to intussusepision in a computed tomography

Discussion

Appendiceal cecal intussusception is very rare and occurs in approximately 0.01% of patients undergoing appendectomy.[1] Appendiceal intussusception may develop due to foreign bodies, lymphoid hyperplasia, polyps, neoplasia and endometriosis.[2] Appendiceal intussusception gives very different findings but often occurs as acute appendicitis. It is difficult to diagnose preoperatively due to the lack of clinical symptoms and findings. Imaging methods play an important role in preoperative diagnosis. Ultrasonography can detect intussusception, but computed tomography is the most sensitive imaging modality for detecting and diagnosing other underlying lesions.[3] Computed tomography is typically detected as a mass or target lesion in the cecum.[4]

Appendiceal mucocele is a rare lesion and the incidence of appendectomies is between 0.2-0.3%.[5] Appendiceal mucocele occurs in the form of a cystic mass in the appendiceal lumen expanding as a result of abnormal mucin deposition. The mucocele may be benign or malignant. Benign mucinous cystadenoma is the most common. Malignant mucinous cyst adenocarcinoma is detected in 11-20% of the cases and spontaneous rupture has been reported in 6% of cases by causing severe dilatation of the appendix.[6] The development of appendiceal pseudomyxoma peritonei due to spontaneous or iatrogenic perforation is associated with malignancy.[7] Appendectomy is usually sufficient in most appendix tumors. Right hemicolectomy should be performed in patients with malignant mucinous lesion or when the benign lesion invades the appendix base. Right hemicolectomy is recommended considering the risk of progression to malignancy when the mucocele exceeds 2 cm in diameter.[7] Reduction should be avoided by considering the risk of rupture when the appendix mucosal intussusception is detected.[8]

In our case, we planned right hemicolectomy because the appendix mucocele reached approximately 5 cm in diameter and intussusception was found.

Ethics

Informed Consent: Consent form was filled out by all participants.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Application: S.B., G.A., Concept: S.B., B.T., Design: B.T., D.D.G., Data Collection: B.T., A.T., Analysis or Interpretation: A.T., D.D.G., Literature Search: S.B., B.T., Writing: S.B.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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CASE REPORT

A Case of Perianal Fistula Presented with Deep Soft Tissue Infection on the Lateral Side of the Thigh

Uyluğun Lateral Tarafında Derin Yumuşak Doku Enfeksiyonu ile Başvuran Bir Perianal Fistül Olgusu

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ABSTRACT

A typical fistula usually consists of a tract with a primary (internal) opening in the anus or rectum and a secondary (external) opening on the perirectal skin. There have been very few case reports where a fistula in ano has traversed an unusual course and caused a diagnostic dilemma. In this report we presented a case of perianal fistula presented with osteomyelitis on the lateral side of right. The patient was previously admitted to another center where she was diagnosed with deep soft tissue infection on thigh associated with osteomyelitis and underwent three consecutive operations within 6 months for drainage and debridement. However healing was not achieved. A pelvic magnetic resonance imaging showed suprasphincteric anal fistula that extended to the lateral side of the right thigh. Crohn's disease was excluded. The patient was referred to our center and fistula tract was irrigated with a 1% silver nitrate solution. After long follow up, the patient showed complete cessation of the discharge with complete healing of external orifices of the fistula.

This report described an unusual perianal fistula extending to the thigh. Previously this case was diagnosed as osteomyelitis. It is important to consider perianal fistulas as a differential diagnosis for this type of wounds and the application of silver nitrate solution often produces a favorable outcome in such cases.

Keywords: Perianal fistula, osteomyelitis, thigh

ÖZ

Tipik bir anal fistül genellikle anüste veya rektumda iç (primer) orifise ve perirektal deride dış (sekonder) orifise sahip bir trakttan oluşur. Literatürde atipik yerleşimli fistüller ile ilgili az sayıda olgular bildirilmiştir. Bu yazıda, sağ uyluğun lateral tarafında osteomiyelit ile başvuran bir perianal fistül olgusu sunulmaktadır. Hasta daha önce başka bir merkeze başvurmuş ve sağ uyluğun lateral tarafında osteomiyelite kadar ilerleyen derin yumuşak doku enfeksiyonu tanısı almış. Drenaj ve debridmanı için 6 ay içinde art arda üç operasyon geçirmiştir. Çekilen pelvik manyetik rezonans görüntülemede sağ uyluğun lateral tarafına uzanan suprasfinkterik anal fistül görüldü. Crohn hastalığı dışlandı. Hasta merkezimize sevk edildi. Fistül traktı %1 gümüş nitrat çözeltisi ile irrige edildi. Uzun takipten sonra hastanın akıntısı tamamen kesildi ve dış ağızlar tamamen kapandı.

Bu yazıda, uylukta osteomiyelit tanısı ile tedavi edilen hastalarda perianal fistüllerin ayırıcı tanıda değerlendirilmesi uygun olacaktır. Bu tarz atipik ve komplike fistüllerde cerrahiye alternatif olarak gümüş nitrat solüsyonu ile irrigasyon uygun bir tedavi yöntemi olarak önerilebilir.

Anahtar Kelimeler: Perianal fistül, osteomiyelit, uyluk

Introduction

Anorectal fistula is a chronic manifestation of the acute perirectal process that forms an anal abscess. When the abscess ruptures or is drained, an epithelialized track can form, which connects the abscess in the anus (or rectum) with the perirectal skin.[1]

A patient with an anal fistula may complain of recurrent malodorous perianal discharge, pruritus, recurrent abscesses, fever, or perianal pain due to an occluded tract.

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A fistula-in-ano represents the chronic phase of ongoing peri-anal infection. It is a granulating tract between the anorectum and the perianal region (or perineum). A typical fistula usually consists of a tract with a primary (internal) opening in the anus or rectum and a secondary (external) opening on the perirectal skin.[2] There have been very few case reports where a fistula in ano has traversed an unusual course and caused a diagnostic dilemma. Perianal fistula extended to the thigh has not been described in the literature before. Here we reported a case of perianal fistula that presented with deep soft tissue infection on the lateral side of the thigh.

Case Report

A 35 year old woman was admitted to Marmara University Faculty of Medicine Department of General Surgery with complaints of cramping right leg pain radiating to the gluteal region. The patient was previously admitted to another center and was diagnosed with deep soft tissue infection on the lateral side of the right thigh associated with osteomyelitis and underwent three consecutive operations within 6 months for drainage and debridement. However healing was not achieved and discharge from the wound continued with sustained pain. In order to better understand the underlying problem, further evaluations were performed. Pelvic magnetic resonance imaging (MRI) results showed a suprasphincteric anal fistula that extended to the lateral side of the right thigh. At that point, the patient was referred to our hospital. Physical examination showed a purulent discharge from 2 different orifices located along a 30 cm scar from incisions during earlier treatment on lateral side of the right thigh and at 40 cm away from the anus (Figure 1). On digital rectal examination no internal orifice was palpated. Her blood test only showed mild neutrophilia. Colonoscopy was performed and Crohn's disease was excluded.

Abdominal and perianal MRI was performed to confirm the diagnosis and determine the level of the fistula. MRI results showed a suprasphincteric fistula located at 11 o'clock on the lithotomy position. The fistula extended through the right obturatorius internus muscle to the gluteal muscles (Figure 2, 3A, 3B).

After informed consent was obtained, treatment with silver nitrate irrigation was performed.

Thereafter, the fistula tract was irrigated with a 1% silver nitrate solution in the outpatient clinic. The patient was positioned in the left lateral decubitus position. An olive tipped malleable metal probe was inserted through the external orifice to check the patency and determine the main tract of the fistula. An 8fr feeding catheter was inserted through the external orifice into the fistula tract. At the same time, a digital rectal exam was performed to ensure that the catheter did not protrude into the anal canal. Once the catheter was properly positioned, 5 mL of 1% silver nitrate solution (MERCK, Germany) was delivered into the fistula tract while withdrawing the catheter from the tract when the patient felt the fluid inside the anal canal. The length of the fistula tract was 30 cm measured by the catheter inserted into the tract. Irrigation was repeated every 4 weeks. A total of 10 irrigations with 1% silver nitrate solution was done. After a total 24 months of follow up the patient showed complete cessation of the discharge with complete healing of external orifices of the fistula without any complication (Figure 4).

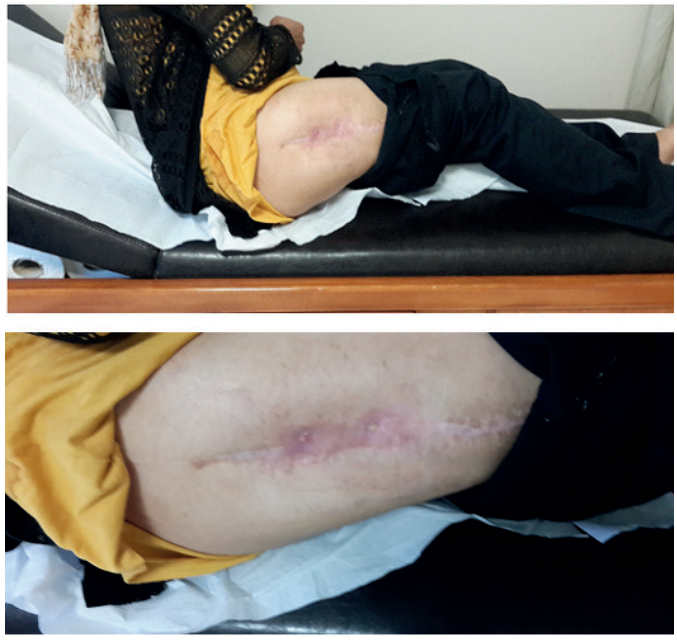

Figure 1. Two different orifices located along a 30 cm scar from incisions during earlier treatment on lateral side of the right thigh

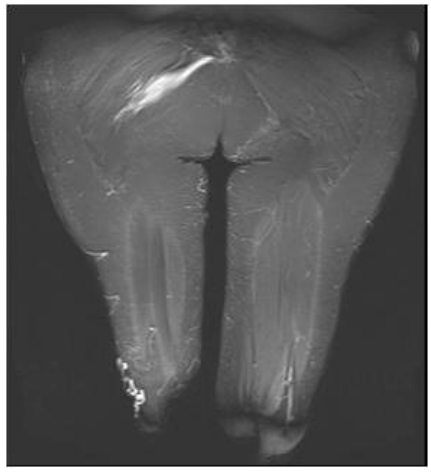

Figure 2. Coronal fat-sat T2-weighted image shows fistul tract orginating from perianal region

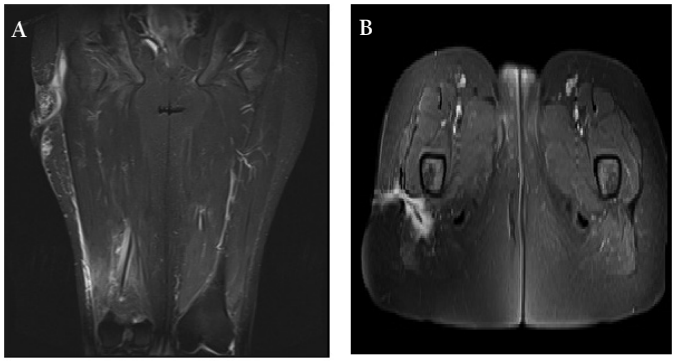

Figure 3. Axial fat-sat T2 weighted contrast enhanced T1-weighted A) Coronal and B) Axial images demonstrate active fistul tract extended lateraly to the femur with secondary (external) opening on the thigh skin

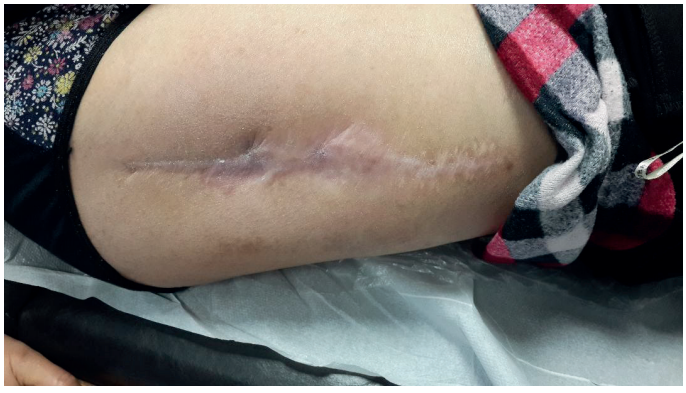

Figure 4. Complete healing of external orifices of the fitula with complete cessation of the discharge after irrigations of the fistula tract with silver nitrate solution

Discussion

The classification system developed by Parks, Gordon, and Hardcastle (generally known as the Parks classification) is the most commonly used system for fistula-in-ano. This system defines four types of fistula-in-ano that result from cryptoglandular infections: intersphincteric, transsphincteric, suprasphincteric, and extrasphincteric.[3]

Intersphincteric fistulas-in-ano account for 70% of all anal fistulas, and extrasphincteric fistulas-in-ano account for 1% of all anal fistulas while the majority of fistulas are cryptoglandular in origin, trauma, Crohn's disease, malignancy, radiation, or unusual infections (tuberculosis, actinomycosis, and chlamydia) may also produce fistulas. A complex, recurrent, or nonhealing fistula should raise the suspicion of one of these diagnoses.[4] In this study we presented a case of complex perianal fistula unrelated to the above mentioned conditions.

In this study we have presented a case of perianal fistula with unusual localization and clinical manifestation. The patient had 3 operations within 6 months because of osteomyelitis and recurrent sepsis before. She was diagnosed with suprasphincteric perianal fistula extending to the lateral side of right thigh. There have been very few case reports where a fistula-in-ano has traversed an unusual course and caused a diagnostic dilemma. One known report includes a fistula in ano involving and causing septic arthritis of the hip.[5] Another case reported a patient who presented with the complaints of a painless lump in the right buttock region and was finally diagnosed as a complex fistula-in-ano presenting as a soft tissue tumor.[2]

Fistulotomy is common treatment modality for anal fistulas. However, fistulotomy is associated with complications such as permanent incontinence, which reduces quality of life. Alternative procedures used to treat complex fistulas include setons, advancement flaps, advancement flap with fibrin sealant, the modified Hanley procedure, and ligation of the intersphincteric fistula tract (LIFT) procedures.[6,7] Regardless of the available procedure techniques, no optimal treatment has been defined for anal fistula. Although various treatment modalities have been described, no treatment for fistula-in-ano described so far can be considered optimal.[8] The need of treatment for anal fistula is because of spontaneous healing is very rarely can occur. One possible explanation for the persistence of anal fistula is the epithelialization of the fistula tract, which prevents the fistula from closing.[9] We reasoned, therefore, that ablation of this epithelial tissue using silver nitrate solution (a corrosive chemical agent) would damage the tract and lead to healing with fibrosis and eventually closure of the tract without surgical intervention. In a previous pilot (preliminary) study, we showed that the application of silver nitrate solution into the fistula tract often produces a favorable outcome in the treatment of anal fistula.[10]

In this case irrigation of the fistula tract with 1% silver nitrate solution was done. After about 2 year of follow up complete cessation of the discharge with complete healing of external orifices was observed.

Conclusion

This report described unusual perianal fistula extending to the thigh which was previously diagnosed as osteomyelitis. It is important to keep in mind the perianal fistulas as a differential diagnosis for this type of wounds and the application of silver nitrate solution often produces a favorable outcome in such cases.

Ethics

Informed Consent: It was obtained.

Peer-review: Externally peer-reviewed.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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Turk J Colorectal Dis 2019;29:58-60

CASE REPORT

Use of Endo-GIA Stapler in Transanal Mass Excision: Case Report

Transanal Kitle Eksizyonunda Endo-GİA Stapler Kullanımı: Olgu Sunumu

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University of Health Sciences, Gülhane Faculty of Medicine, Department of General Surgery, Ankara, Turkey

ABSTRACT

Rectal cancers comprise approximately 1/3 of colorectal cancers. Tumors tha treach the submucosa on the rectum wall but do not overcome the submucosa are called early rectal cancers. T1 and T2 early-stage rectal cancers can be treated by transanal local excision. In this case report we present a 64-year old patient with a vegetating mass, 6 cm from anal verge, diagnosed with intramucosal adenocarcinoma. The suggested operational procedure was abdominoperineal resection, which she did not consent and referred to our clinic. She was performed a transanal resection the tumor using an Endo-GİA stapler.

Keywords: Transanal, mass, Endo-GIA

ÖZ

Rektum kanseri kolorektal kanserlerin yaklaşık 1/3'ünü oluşturmaktadır. Rektum duvarında submukozaya uzanan ancak submukozayı aşmamış tümörlere erken rektum kanseri denir. T1 ve T2 erken evre distal rektum kanserleri anal yoldan (transanal) lokal eksizyonla tedavi edilebilirler. Bu olgu sunumunda, anal kanala 6 cm mesafedeki intramukozal adenokarsinoma tanılı vejetan kitleye abdominoperineal rezeksiyon önerilen ancak bu teklifi kabul etmeyip kliniğimize müracaat eden 64 yaşındaki kadın hastaya Endo-GİA stapler kullanarak uyguladığımız transanal rezeksiyon deneyimimizi sunmak istedik.

Anahtar Kelimeler: Transanal, kitle, Endo-GİA

Introduction

Colorectal cancer is the third most common cancer among all cancers. Approximately 1/3 of colorectal cancers constitute rectal cancer.[1,2] Various definitions are used according to tumor propagation in rectum cancer and whether the tumor can be removed completely by surgery. Early rectum cancer terminology is used for T1 tumors extending but not exceeding to the sub-mucosa.[3] T1 and T2 distal rectal cancers can be treated by anal approach (transanal) by local excision.[4] In addition, transanal local excision has a low morbidity rate in patients who cannot tolerate major abdominal surgery due to comorbidities, and who do not want abdominoperineal resection (APR) surgery, and who may have short life expectancy due to diffuse distant metastasis. The transanal pathway is the most commonly used method for local excision. With the traditional transanal approach, tumors located in the distal and middle rectum (up to 10 cm proximal to anal verge) can be reached. The aim of this approach is the removal of rectum cancer at a minimum depth of 1 cm lateral margins and rectal fat tissue with full-thickness excision technique, within clean surgical margins. The remaining defect is closed to the primer. If the excision limits are not clear, radical resection is considered.[5,6,7]

Some authors have described the transanal removal of large rectal adenomas with gastrointestinal anastomosis (GIA) staplers and demonstrated how endoscopic linear stapler can be adapted to excision with optimal results.[8,9,10,11,12] Transanal Endo-GIA may be used in large-volume lesions in the lower and middle part of the rectum, and in moderate or severe dysplasic villous polyps or carcinoma in-situ.

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Received/Geliş Tarihi: 01.06.2018 **Accepted/Kabul Tarihi:** 30.07.2018

In this paper, we present a case of carcinoma in-situ which we resected using the transanal approach with Endo-GIA stapler (Endo-GIA™ reinforced reload with tri-staple™ technology/medtronic/United States Surgical Corp.).

Case Report

A 64-year-old female patient presented with rectal bleeding, rectal fullness and tenesmus complaints. A broad-based vegetan mass was seen in the colonoscopy, in the rectosigmoid region and in the rectum proximal polyps and in the ampulla recti. *Polyps were excised* and multiple biopsies were taken from vegetative masses.

As a result of pathology, tubulovillous adenoma structure with high grade dysplasia in large areas excised for polyp excised (intramucosal adenocarcinoma developed on the basis of tubulovillous adenoma with high grade dysplasia) and tumoral tissue forming cribriformity towards lamina propria in several microscopic areas and intact surgical margin were reported. Biopsies of the vegetative mass did not show significant polyp structure, and the specimens were fragmented and high grade dysplasia, and they were reported as tumoral tissue (intramucosal adenocarcinoma) forming cribriformity toward lamina propria in several microscopic areas.

Abdominal magnetic resonance imaging was performed at the external center and a lobulated contoured mass of 36x26x19 mm was observed on the posterior wall 6 cm proximally from the anal canal in the rectum. Mezorectal and prerektal fascia were preserved. There were 7 LAPs with perirectal 4-7 mm diameter unrelated to malignancy. The appearance of other organs and structures was normal. The patient was informed about APR surgery at the center, but the patient refused to undergo this operation. The patient presented to our clinic for sphincter protective surgery. After preoperative evaluation, the patient with T1 rectum tumor was informed about the progression of the disease and all possible risks and recommended transanal mass excision. The patient underwent mass resection with a transanal approach in the lithotomy position with endoscopic GIA stapler (Figures 1, 2, 3 and 4). The patient was discharged on the second day.

The pathology results of the removed tissue revealed intramucosal carcinoma, tubulovillous adenoma with high dysplasia, intramucosal carcinoma focus 0.3 cm, stromal invasion and stalk invasion were not seen in the sample. Adjuvant therapy (chemoradiotherapy) was not planned after the operation. The patient's informed consent was obtained for presentation as case report. During the 5-month follow-up of the patient, no complications or early signs of local recurrence were found.

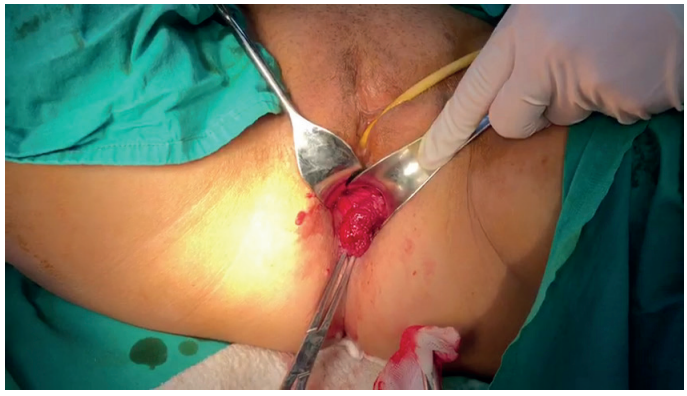

Figure 1. Pre-processing of the mass

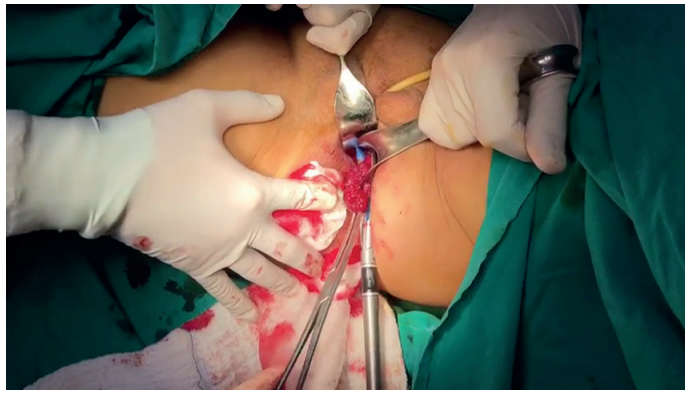

Figure 2. Show the process of resection with Endo-GIA stapler

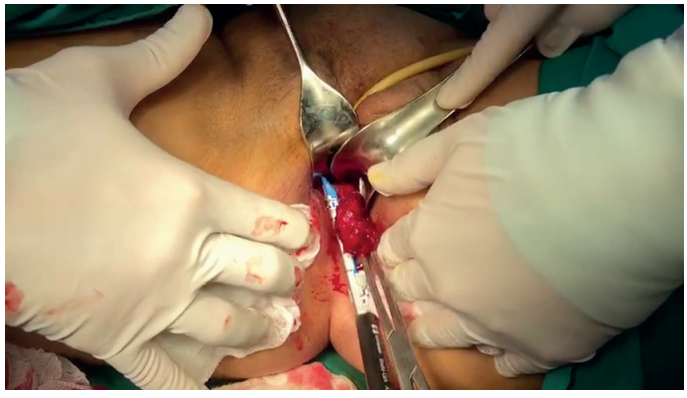

Figure 3. Show the process of resection with Endo-GIA stapler

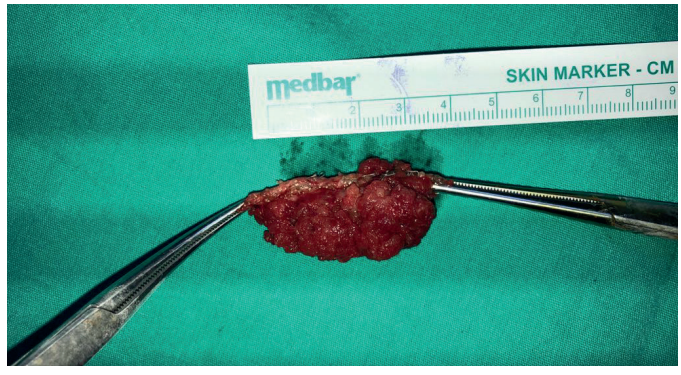

Figure 4. View of the mass after resection

Discussion

The main indication for the use of Endo-GIA in the lower and middle rectum masses is the excision of benign tumors, but radical oncologic surgery can be performed successfully in cases of *in situ* carcinoma[13]. Since total mesorectal excision (TME) is shown to be a safer technique in T1 rectum cancer, this should be the preferred method.[14] However, we underwent transanal mass excision surgery because of the patient's preference for sphincter sparing surgery. In fact, it is not the right approach to compare the transanal mass excision with TME. However, transanal resection with Endo-GIA is comparable to conventional transanal excision and transanal endoscopic microsurgery (TEM). Endo-GIA has the following advantages:

- Low risk of complications,
- Less or no bleeding during the procedure,
- Non-complicated post operative period and shorter operative time,
- Always a one-step procedure,
- Early oral intake,
- Shorter hospital stay,
- Postoperative less pain,
- A cleaner surgical margin for analysis.[13]

In the transanal resection of the Endo-GIA, the lesion is more easily accessible as a surgical technique. This advantage is much more pronounced compared to conventional transanal excision and TEM. Moreover, Endo-GIA is cheaper than the TEM device which is not available anywhere, and it is easier to obtain and apply. There are two disadvantages associated with the use of Endo-GIA. These; the distance of the lesion to the anal canal is not more than 10 cm and its cost is higher than the transanal conventional excision. On the other hand, with this technique, in the case of a surgical margin containing tumor cells or a tumor larger than T1 in the pathology, a radical surgery can be performed with a transabdominal approach without any other complication.[13]

Conclusion

Transanal excision is an appropriate surgical technique in patients who have been staged well and are not considered to be invasive, and who do not accept major surgery or ostomy. We recommend the use of endoscopic stapler in such appropriate cases because of its advantages to other methods in terms of surgical technique.

Ethics

Informed Consent: The patient's informed consent was obtained for presentation as case report.

Peer-review: Externally peer-reviewed.

Authoring Contributions

Surgery and Medical Practice: M.T.Ö., Ş.K., Concept: Ş.K., Design: Ş.K., Data Collection or Processing: Ş.K., M.D., Analysis or Interpretation: M.T.Ö., Ş.K., Literature Search: Ş.K., Written: Ş.K., M.T.Ö.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

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Turk J Colorectal Dis 2019;29:61-64

CASE REPORT

Primary Colon Lymphoma Presenting with Obstructive and Hemorrhagic Symptoms

Obstrüktif ve Hemorajik Semptomlarla Seyreden Primer Kolon Lenfoması

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ABSTRACT

Colorectal lymphomas comprise less than 1% of colorectal malignancies and 1% of non-Hodgkin lymphomas. Colonic lymphomas are usually diagnosed after surgical resection performed due to complications. Herein we present the management of a rare case of non-Hodgkin ascending colon lymphoma in a 57-year-old female patient with obstructive and hemorrhagic symptoms. Although surgery treats the complications, non-surgical therapies (chemotherapy and radiotherapy) are the mainstays of treatment for lymphoma, and surgery is not considered a priority for lymphoma treatment.

Keywords: Colon, lymphoma, obstructive, hemorrhagic

ÖZ

Kolorektal lenfomalar, kolorektal malignitelerin %1'inden azını ve non-Hodgkin lenfomaların %1'ini oluşturur. Kolonik lenfomalar genellikle komplikasyonlar nedeniyle yapılan cerrahi rezeksiyonlar sonrasında tanı alır. Burada obstrüktif ve hemorajik semptomları olan 57 yaşındaki bir olgu üzerinden nadir görülen bir non-Hodgkin çıkan kolon lenfomasının yönetimi sunulmaktadır. Cerrahi komplikasyonları tedavi etse de, cerrahi olmayan tedaviler (kemoterapi ve radyoterapi) lenfomanın ana tedavisidir ve cerrahi tedavi lenfomanın öncelikli tedavisi olarak kabul edilmez.

Anahtar Kelimeler: Kolon, lenfoma, tıkayıcı, hemorajik

Introduction

Colorectal lymphomas comprise less than 1% of colorectal malignancies and 1% of non-Hodgkin lymphomas.[1] Diagnosis is usually delayed due to non spesific symptoms such as abdominal pain, fatigue and weight loss. Herein we present the management of non-Hodgkin ascending colon lymphoma, which is a rare condition.

Case Report

A 57-year-old female patient was admitted with abdominal pain, fatigue and abdominal swelling that had been persisting for 3 months. There were sympoms of partial bowel obstruction such as difficulty in passing flatus and feces. Her medical history was uneventful, except for cigarette smoking of 30 packs/year. Her aunt had gastric carcinoma. On physical examination, blood pressure was 100/70 mmHg, heart rate: 105 bpm; there was a firm, immobile mass lesion in the right lower quadrant on palpation. The other body parts were normal (no pathological lymph node, etc.). Laboratory test results revealed a white blood cell count of 4200x103/uL, hemoglobin: 7.1 g/dL, hematocrit: 22.4%, and the biochemistry test results were normal. Thoracic and abdominal computed tomography (CT) revealed a 15x15 cm

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of tumor mass in the ceacum (Figure 1). Esophago-gastro-duodenocopy revealed antral gastritis and high degree of *helicobacter pylori* positivity. Colonoscopy revealed a hemorrhagic, fragile mucosa over the hepatic flexura and an obstruction beginning from that point, preventing the colonoscope to move to the proximal colon. Multiple biopsies were obtained from this region and pathology examination revealed non-specific colitis. The patient was prepared for operation with the preoperative diagnosis of a mass lesion leading to hemorrhage and obstruction in the right colon. Right hemicolectomy + partial ileum resection + ileocolostomy were performed due to the mass lesion involving the ileal segments (Figure 2). The patient was discharged on postoperative day 5. Subsequent to discharge wound infection developed which was handled in an outpatient setting.

The resected specimen was 48 cm in length and mass lesion was seen to be adhered to the small intestine in macroscopic examination. The proximal and the distal surgical borders were intact. On microscopic examination, hematoxylin and eosin 400x magnification revealed infiltration composed of large lymphoid cells (Figure 3). CD3, CD5, cycline D1, CD43 and CD23 were found to be negative on immune histochemical examination. CD20 was determined to be positive (Figure 4). Under the light of these data, the patient was evaluated as diffuse large B-cell colonic non-Hodgkin lymphoma.

^{18}fluoro deoxyglucose positron emission tomography (^{18}FDG PET)-CT, which was performed for postoperative staging, revealed lymph nodes located in the mesenteric fat tissue in the operative field with a maximum diameter of 1.5 cm, with standard uptake ratio maximum: 15, and relatively increased ^{18}FDG uptake in the bone marrow. The disease was located at the abdomen (colonic involvement, 10-12 cm, extranodal area) and more than one lymph node had been involved. Bone marrow aspiration and bone marrow biopsy did not reveal infiltration. The patient was noted not have B symptoms (fever, weight loss, night sweats) preoperatively. According to these results, the patient was considered to have stage 2E disease according to the Lugano Ann Arbor classification. International Prognostic Index (IPI) and National Comprehensive Cancer Network® IPI scores were low (0 score), low intermediate (2 score) with regard to risk scoring.[2]

We planned 6 cycles of rituximab, cyclophosphamide, doxorubicin, vincristine, prednisone (R-CHOP) chemotherapy and sequential radiotherapy (RT) under the light of the current literature and guidelines. The result of ^{18}FDG PET-CT, which was performed in order to assess the response after the second cycle of chemotherapy, the disease was determined to have completely regressed. The treatment of the patient continues uneventfully. The written consent of the patient about publication has been taken during the outpatient clinic control.

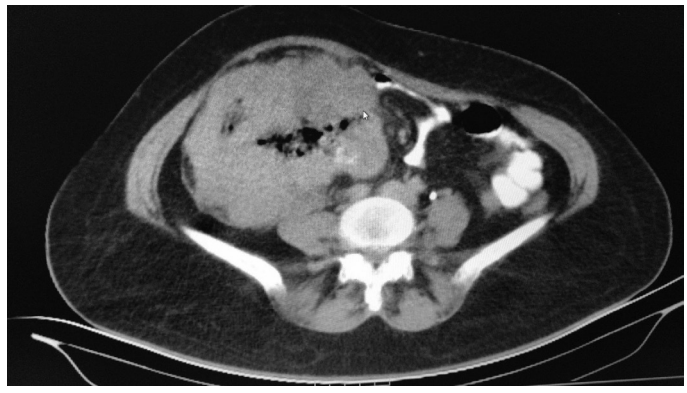

Figure 1. Computed tomography image of caecal mass lesion

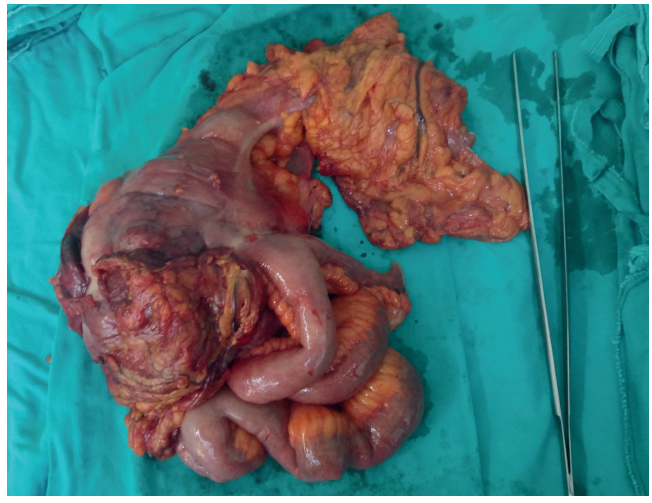

Figure 2. Operative material of right hemi-colectomy + partial ileal resection

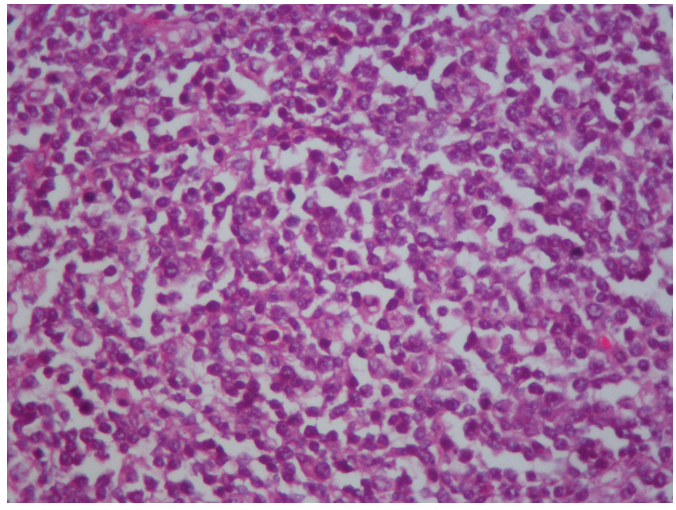

Figure 3. Large magnification has revealed the infiltration composed of atypical, large lymphoid cells (x400 H&E)

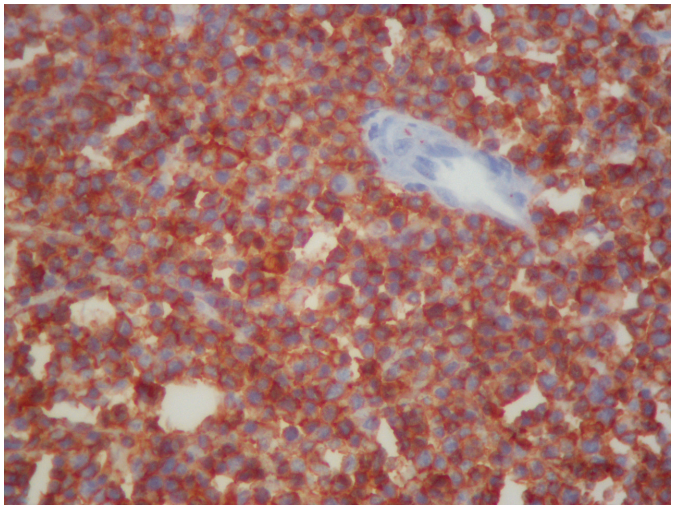

Figure 4. Atypical lymphoid cells were seen to be CD20 positive (CD20, x400)

Discussion

Complete excision of the lymph node or obtaining sufficient tissue sample from the lymphoma mass lesion is the most accurate method for diagnosis of lymphoma. If sufficient tissue sample can not be obtained the subtype of the lymphoma cannot be determined accurately resulting in the patient to receive insufficient treatment or over treatment. Besides, sufficient biopsy material may not be obtained with minimally invasive methods in gastro-intestinal lymphomas. In this case, surgery may treat the complications such as obstruction, hemorrhage or perforation besides enabling the diagnosis.[3] Tumor-related partial obstruction and chronic blood loss were also treated through surgery in our case.

Although the etiology of primary gastrointestinal system lymphomas has not been clearly understood, related factors include helicobacter pylori infection, rheumatic fever, Sjogren's syndrome, systemic lupus erythematosus, granulomatosus with polyangiitis, Celiac disease, inflammatory bowel diseases, and immune suppression (following organ transplantation or *Hypersensitivity vasculitis* infection).[4] *H. pylori* infection was positive in gastric biopsy in our patient which needs to addressed later. The other factors were not present.

The initial examination of the patient diagnosed with lymphoma should include a comprehensive physical examination including performance status and all lymph nodes followed by laboratory tests (complete blood count, lactate dehydrogenase, uric acid, beta 2 microglobulin and hepatitis markers HBsAg, anti-Hbs, anti-HbcIgG, immunoglobulin M- and human immundeficiency virus (HIV) markers.[5] Calcium, potassium, phosphorous, uric acid and renal functions should also be analyzed in patients who have high tumor load and elevated lactate dehydrogenase.[6]

Our patient had negative serology for hepatitis and HIV. Postoperative lactate dehydrogenase, beta 2 microglobulin and also tumor lysis syndrome markers calcium, potassium, phosphorous, uric acid, blood urea nitrogen, and creatinine were within the normal ranges.

Early stage (1-2) bulky group (>7.5 cm) has a poorer prognosis than non-bulky group and the clinical course is similar with stage 3-4 disease. Therefore, this group of patients should undergo a more aggressive therapy such as 6 cycles of R-CHOP + RT. Although adding RT is not undisputable, applying RT to >7.5 cm bulky node has provided a statistically significant benefit according to the RICOVER-noRTH study.[7] Our patient is being treated in accordance with 6 cycles of R-CHOP + RT plan.

In conclusion, colonic lymphomas are usually diagnosed after surgical resection performed due to complications. Although surgery treats the complications of the bulky or obstructing tumor, it cannot be regarded as the primary treatment modality for lymphoma. Non-surgical therapies (chemotherapy and RT) are the cornerstone of lymphoma treatment.

Ethics

Informed Consent: Informed consent has gathered from the patient during her outpatient control.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: N.İ., A.D., E.Ç., C.K.P., Concept: N.İ., C.M., B.K., K.E.E., A.A., F.D., Design: N.İ., E.Ç., A.D., C.K.P., B.K., C.M., Data Collection or Processing: N.İ., A.A., F.D., K.E.E., C.M., B.K., Analysis or Interpretation: N.İ., E.Ç., A.D., C.K.P., Literature Search: N.İ., C.K.P., F.D., A.A., Writing: N.İ., B.K., K.E.E., C.M.

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