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RESEARCH ARTICLE

Approach to Appendiceal Masses Due to Acute Appendicitis: Analysis of 126 Cases

Akut Apandisite Bağlı Gelişen Apendiks Kitlelerine Yaklaşım: 126 Olgunun Analizi

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ABSTRACT

Aim: This study aimed to present our clinical approach in patients with clinical manifestations of delayed appendicitis and appendiceal mass.

Method: Data of 126 patients with appendiceal mass and admitted to our clinic between January 2008 and December 2018 were retrospectively analyzed. Diagnoses were made by physical examination, laboratory examination, and imaging methods.

Results: Of the 126 patients, 43 (34.1%) underwent emergency surgery. Of those emergent cases, 36 patients underwent appendectomy and seven had right hemicolectomy. The pathological finding was adenocarcinoma in three patients (2.4%) who underwent right hemicolectomy. Twenty-nine patients (23%) underwent interval appendectomy. The mean duration of interval appendectomy was 6.2 (range, 2-10) months. The pathological finding was appendicitis in all patients. The mean follow-up period of the 54 patients (42.9%) who did not undergo surgery was 32.6±2.4 months. During this follow-up period, three patients were diagnosed with appendix tumours and two patients with Crohn's disease. Appendectomy was performed in two (1.3%) patients.

Conclusion: Appendiceal masses may be treated conservatively without delayed appendectomy. Patients can undergo surgery only in case of recurrence of appendicitis. Computed tomography and colonoscopy within 4-6 weeks after completing the conservative treatment is recommended in all patients. However, this treatment protocol should be supported by larger prospective studies with long-term follow-up.

Keywords: Appendiceal mass, emergency appendectomy, interval appendectomy, appendicitis

ÖZ

Amaç: Gecikmiş apandisit ve apandisiyel kitle klinik bulguları olan hastalarda klinik yaklaşımımızı sunuyoruz.

Yöntem: Ocak 2008-Aralık 2018 tarihleri arasında kliniğimize apandiseal kitle tanısı ile başvuran 126 hasta retrospektif olarak incelendi. Tanı, fizik muayene, laboratuvar ve görüntüleme yöntemleri ile konuldu.

Bulgular: Kırk üç hastaya (%34,1) acil cerrahi uygulandı. Ortaya çıkan bu olgulardan 36'sına apendektomi ve 7 sağ hemikolektomi uygulandı. Sağ hemikolektomi yapılan 3 hastada (%2,4) patoloji adenokarsinom idi. Yirmi dokuz hastaya (%23) aralıklı apendektomi uygulandı. Ortalama aralık apendektomi süresi 6,2 (aralık, 2-10) aydı. Tüm hastalarda patoloji apandisit olarak bildirildi. Ameliyat edilmeyen 54 hastanın (%42,9) ortalama takip süresi 32,6±2,4 aydı. Bu takip süresi boyunca 3 hastaya tümör ve 2 hasta Crohn hastalığı tanısı konuldu.

Sonuç: Apendiks kitleleri, gecikmiş apandisit ameliyatı olmadan konservatif olarak tedavi edilebilir. Bu hastalar sadece apandisit nüksü durumunda ameliyat edilebilir. Konservatif olarak tedavi edilen tüm hastalara, konservatif tedaviyi tamamladıktan sonra 4-6 hafta içinde bilgisayarlı tomografi ve kolonoskopi yapılması önerilir. Ancak bu tedavi protokolü uzun süreli takip ile daha geniş prospektif çalışmalarla desteklenmelidir.

Anahtar Kelimeler: Apendiks kitlesi, acil apendektomi, aralıklı apendektomi, apandisit

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Introduction

Acute appendicitis is still the most common surgical pathology worldwide and may present with a clinical spectrum ranging from oedematous appendicitis to perforation or appendiceal mass.[1] These complications occur in 2%-7% of the cases.[2,3] Appendiceal mass due to acute appendicitis occurs when the omentum and intestinal organs adhere to the perforation area following appendix wall perforation.[2,3,4]

Three approaches to appendiceal masses exist. First is immediate appendectomy. If the appendix cannot be found during the operation, fistula formation and similar complications may occur because of excessive tissue oedema and fragility of the structures forming the mass. Second is delayed appendectomy performed 2 months following conservative treatment. The third approach defined recently is widely accepted and is completely conservative.[5,6,7] Each method has its own limitation and there is no consensus yet.

In this study, we aimed to present our clinical approach to patients admitted with clinical manifestations of delayed appendicitis diagnosed as appendiceal mass.

Materials and Methods

The study was carried out in accordance with the principles of the Helsinki Declaration and was approved by the local Institutional Review Board (approval no. 531 dated 01/2020).

Medical records of 140 patients diagnosed with appendiceal mass and admitted to our clinic between January 2008 and December 2018 were retrospectively reviewed. Diagnosis was made by physical examination, laboratory examination, and imaging methods. Patients with percutaneous abscess drainage on admission and had exploratory laparotomy without resection were excluded from the study. Moreover, 14 were excluded because their follow-up data were not accessible.

Patients were classified into groups according to the treatment received: emergent appendectomy (group 1); interval appendectomy, that is, patients were conservatively followed for 8-10 weeks with antibiotics and then underwent appendectomy (group 2), and conservative treatment, that is, antibiotherapy alone without appendectomy (group 3).

Outcome parameters were age, sex, pathology, interval appendectomy time, and recurrent episodes. Morbidity includes postoperative infectious complications, intestinal fistula, small bowel obstruction, and recurrence after initially successful nonsurgical management.

Statistical Analysis

Statistical analyses were performed using SPSS version 22.0 (IBM Corp., Armonk, NY, USA). Continuous variables with normal distribution were expressed as mean ± standard deviation, and those with not normal distribution as median (minimum-maximum) values. Categorical variables are expressed as n (%) values.

Results

The mean age of the patients was 43.75±2.4 (range, 16-84) years. The mean hospital length of stay was 6.6±1.3 days. The mean duration between admission and onset of symptoms was 5 days.

The mean white blood cell count upon admission was 15,200/mm^3 (8,000-30,130), while the mean C-reactive protein level was 8.6±2.1 mg/dL. Abdominal ultrasonography (US) was performed in all patients, and abdominal computed tomography (CT) was performed in 68.3% of the patients Figure 1.

In this study, 43 (34.1%) underwent emergent appendectomy, of which 36 underwent appendectomy alone and seven had concomitant right hemicolectomy. Adenocarcinoma was detected in three patients (2.4%) in whom right hemicolectomy was performed. In addition, 29 patients (23%) underwent interval appendectomy. The mean interval between admission and surgery was 6.2 (range, 2-10) months. Eight of these patients underwent laparoscopic appendectomy. The pathological finding was appendicitis in all patients.

The conservative group consisted of 54 (42.9%) patients. These patients were given antibiotherapy without surgery alone and then discharged. The mean time of antibiotherapy was 2 weeks. The decrease in body temperature, normalisation of heart rate, regression of abdominal pain, cessation of gastric content from the nasogastric catheter, and decrease in white blood cell count were considered in the evaluation of response to conservative treatment.

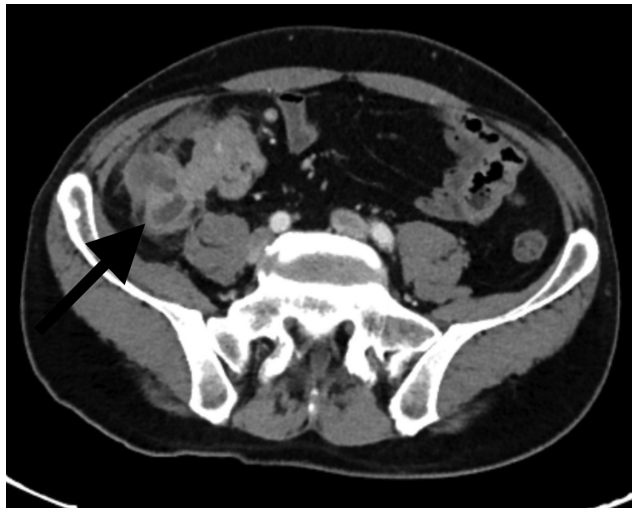

Figure 1. Computed tomography image showing appendiceal mass

Histopathologic examination of the sectioned preparations confirmed appendix tumours in three patients who underwent right hemicolectomy. These patients were followed for 32.6±2.4 months. During this follow-up period, two patients were diagnosed with Crohn's disease. One patient reported right lower quadrant pain for once and the other twice. Appendectomy was performed in both patients.

Discussion

Appendiceal mass is defined as a pathology that occurs when the omentum and intestinal organs adhere to the perforation area as a result of appendix wall perforation. The methods used in the management of appendiceal masses have inherent limitations and there is no consensus yet.

Advocates of emergent appendectomy argue that this will eliminate the long-term conservative treatment process and prevent mission of malignancies and re-hospitalisations.[8,9] Those who oppose assert that intervention to these inflamed tissues will increase complications and cause unnecessary intestinal resection.[10] In our study, 43 patients underwent emergent surgery, of which 36 had undergone appendectomy alone and seven had concomitant right hemicolectomy.

Routine interval appendectomy was reported to increase morbidity by 19% and costs by 38%.[11] Barnes et al.[12] did not detect any pathology related to previous inflammation in appendices extracted during elective appendectomies. No appendix was found in 0%-16% of the cases in laparotomies performed for elective appendectomies.[13,14] In our study, 29 patients underwent interval appendectomy. The mean duration of interval appendectomy was 6.2 (range, 2-10) months. Eight underwent laparoscopic appendectomy.

Non-operative or conservative treatment of plastron appendicitis in adult patients was first reported in the 1920s.[1] The recurrence rate in conservative treatment ranges from 0 to 80%, but recurrences usually occur in the first 6 months.[2,3,6,7] In our study, 54 patients underwent successful conservative treatment with broad-spectrum combined antibiotherapy, analgesics, and hydration and were routinely followed. Despite differences, antibiotherapy should cover Gram (+), Gram (-), and anaerobic bacteria.[15] The mean follow-up period in our conservative group was 32.6±2.4 months. Two of those patients (1.6%) had relapse after discharge. This rate is lower than the published rates of 13%.[6]

Patients with appendiceal mass usually present themselves 1 week after symptom onset.[2,3,6,7] In our study, the interval between onset of symptoms and admission was 1 week. The mean hospital length of stay was 6.6±1.3 days in our study.

Appendiceal mass can be diagnosed by US in 70% of the patients, but CT is still the gold standard.[16] Appendectomy can be performed in cases where no mass is detected in abdominal examination or abdominal CT.[16] In this study, abdominal US and CT were performed in 68.3% of the patients.

One of the issues in appendiceal masses is whether the mass is malignant or not. The probability of other pathologies in appendiceal masses due to acute appendicitis has been reported as 0%-12 %.[17,18] Malignancy should be ruled out by colonoscopic examination in patients aged >40 years who showed favourable responses to conservative treatment.[18,19] Malignancy was detected in 3 (2.4%) patients in our study, and all were adenocarcinomas.

Supporters of delayed appendectomy state that a significant proportion of conservatively monitored patients may be candidates for recurrent appendicitis in the future at a rate of 10%-46%.[20,21,22] This rate is very low in our series (1.6%) compared with published rates. Another suggestion regarding the necessity of delayed appendectomy is the suspicion of carcinoid tumour that may be overlooked. However, this tumour has a very low incidence (0.1-0.5) and is not clinically manifested in most cases. Therefore, it should not be a rationale for delayed appendectomy.[23]

This study has some limitations. First, our study had retrospective design and small sample size that may cause a high probability of a type 1 error. Second, the experience was restricted to the outcomes of a single institution. Third, detailed history and some possible factors that may influence the outcome were not completely documented. Given these restrictions, associations should be interpreted with caution.

Conclusion

Our findings support the opinion that cases with appendiceal mass may be treated conservatively without delayed appendectomy. Conservative treatment without interval surgery seems to be the preferred method for treatment of appendiceal mass and abscess. Patients can undergo surgery only in case of recurrence of appendicitis. US or CT of appendiceal abscess can detect risk factors for recurrence of appendicitis. CT and colonoscopy within 4-6 weeks after conservative treatment is recommended in all patients. However, this treatment protocol should be supported by larger series with longer follow-up.

Ethics

Ethics Committee Approval: The study was carried out in accordance with the principles of the Helsinki Declaration and was approved by the local Institutional Review Board (approval no. 531 dated 01/2020).

Informed Consent: Informed consent was not received due to the retrospective nature of the study.

Peer-review: Internally and externally peer reviewed.

Authorship Contributions

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

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