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RESEARCH ARTICLE

How can I Start an Multidisciplinary Team for Management of Rectal Cancer Patients? Analysis of the Feasibility of Using American National Accreditation Program for Rectal Cancer Patients Standards in a Low-Income Country Hospital

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ABSTRACT

Aim: The advent of the multidisciplinary approach to rectal cancer patients has resulted in a paradigm shift when treating these patients. Few programs exist that lay the basis for establishing basic principles for creating such committees.

Method: During the year 2021, a multidisciplinary team was created in a university hospital in Buenos Aires for the management of patients with rectal cancer, following the guidelines proposed by the "National Accreditation Program for Rectal Cancer Patients (NAPRC)". After the first four months of using this system, a summary of the program was made. The feasibility of applying these guidelines in our hospital was evaluated, and the first patients presented in committee were considered.

Results: During the study period, four committee meetings were held and 17 patients with a mean age of 69 years (29-86) were presented, following the standards proposed by the NAPRC. Of these patients, 64.70% (11/17) had lower rectal tumors, 94.11% (16/17) were adenocarcinomas, and locally advanced stage was found in 68.75% (11/16). In 75% (12/16), neoadjuvant therapy was recommended, and one patient had a complete clinical response after neoadjuvant treatment. Following NAPRC recommendations, all patients fulfilled the requirements for the MDT team approach.

Conclusion: NAPRC guidelines could be of use in establishing a multidisciplinary committee to approach patients with rectal cancer in hospitals of low-income countries. Further experience needs to be presented to evaluate if the use of this guidelines is associated with improved clinical results.

Keywords: Rectal, cancer, MDT, radiotherapy, neoadjuvant

Introduction

Worldwide, colorectal cancer is the third most common cancer, and represents the second largest cause of cancer-related deaths.[1] Moreover, the incidence of this type of tumors has been increasing in a younger population, who seem to have worse prognosis.[2] However, the prognosis and functional results in rectal cancer patients has improved due to advances in its treatment and centralization of care in specialized centers.[3]

For these reasons, the American College of Surgeons launched the National Accreditation Program for Rectal Cancer (NAPRC) in 2007, intending to set the basis of multidisciplinary management of rectal cancer patients, and therefore, improve results of treatment.

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The purpose of this article is to present the program and evaluate the feasibility and applicability of NAPRC standards in a university hospital in a low-income country.

Materials and Methods

This manuscript was performed following international guidelines for data protection, and all patients involved signed an informed consent to share their anonymized information for investigation purposes.

During the period between June and September 2021, a multidisciplinary care program for patients with rectal cancer was created, following the standards proposed by the NAPRC.

Basis of the NAPRC

The main objective of the NAPRC was to ensure that patients with rectal cancer receive adequate care, based on a multidisciplinary model of care.

The program is based on four fundamental principles:

- Establish a multidisciplinary team committed to the objective of the program with specialists in the area.
- Improvement of the patient care processes.
- Improvements in the results obtained by auditing the care processes.
- Adoption of adequately validated performance measures.

The multidisciplinary committee must have specialists in pathology, imaging diagnosis, colorectal surgery, clinical oncology and radiotherapy (RT).

In turn, a program director in charge of chairing the committee and reporting its performance, and a program coordinator responsible for registering and monitoring patients during their treatment must be appointed. Figure 1 shows the structure of the rectal cancer MDT in our hospital.

The statute of the program recommends a periodicity of at least two meetings every month. However, due to the clinical reality and the volume of patients in our environment, it was carried out on a monthly basis. Likewise, a minimum percentage of "presenteeism" for each member of the committee has been established, which varies according to specialty (for surgeons, it is 50%). "Presentism" is controlled by the program coordinator.

Regarding the data storage of each program, at our hospital we adapted a model used at the Cleveland Clinic, Florida, United States. A copy of this file can be seen in Figure 2.

Accreditation to the program requires that a minimum of 50% of rectal cancer patients treated at the institution have a clinical record. Once the treatment has been decided, the patient must start the treatment received within 60 days of the decision.

The requirements of each area will be developed below.

Pathology

The program requires that at least 90% of surgical specimens are evaluated by a professional who is part of the team.

The anatomo-pathological report protocol is carried out following the bases proposed by the "College of American

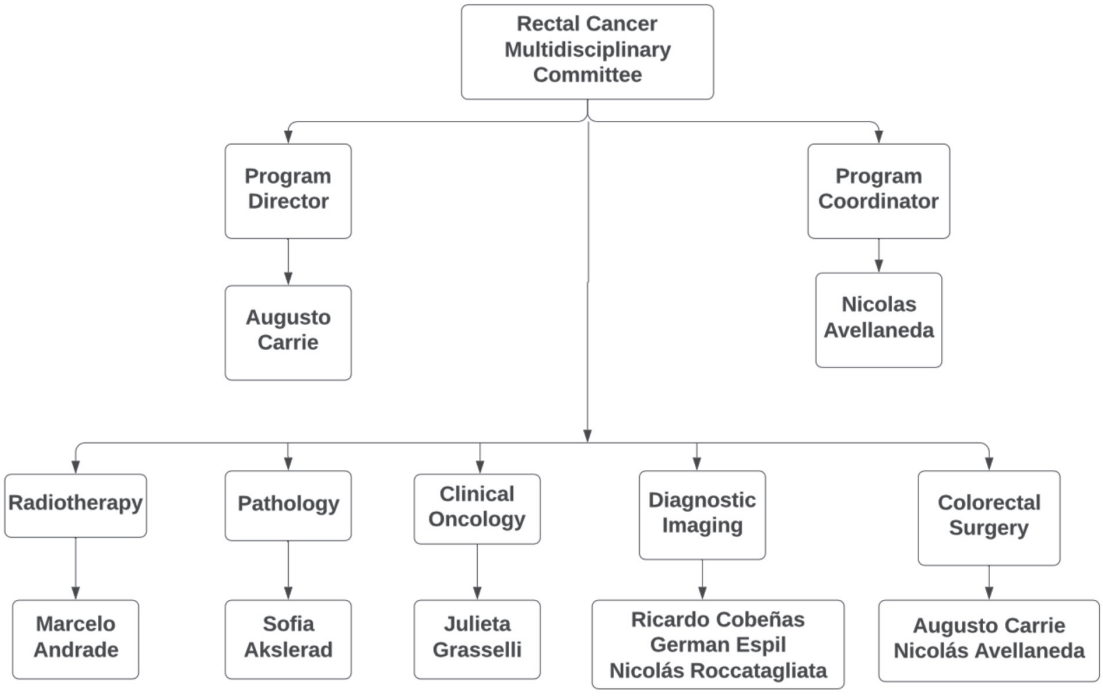

Figure 1. Structure of the rectal cancer committee

Pathologists (CAP)",[4] and photographs of the surgical specimens must be recorded.

Summarizing the CAP standards, a correct evaluation should include the anatomical location of the specimen, evaluation of the mesorectum, depth of invasion and margins. At the microscopic level, it is essential to establish the histological type, the grade and the presence of lymphatic embolism or tumor implants in the specimen. Lymph nodes affected must also be assessed.

Regarding the evaluation of the mesorectum after a total or partial excision, the classification proposed by Nagtegaal et al.[5] is used, which establishes three categories according to the quality of the mesorectum: incomplete; partially complete; or complete.

The circumferential margin of resection is measured from the maximum depth of the tumor to the margin of resection.[6]

To stratify the histological grade of the tumor, the CAP establishes four histological grades, from 1 to 4 (1 well differentiated and 4 undifferentiated).

Finally, in patients who have previously undergone neoadjuvant treatment for rectal cancer, the modified Ryan score[7] is the parameter used to confirm the degree of response to therapy, and establishes four levels or grades, which must be measured according to the tumor (and not in the lymph nodes).

Tumors should be staged according to the classification of the "American Joint Committee on Cancer".[8]

Clinical Oncology

Rectal cancer treatment has been revolutionized after the advent of neoadjuvant therapy for patients with locally advanced rectal tumors and those with lower rectal tumors, allowing strategies aimed to organ preservation in the latter group.[9-11]

The guidelines of the "National Comprehensive Cancer Network (NCCN)"[12] are used to choose the appropriate treatment for each patient presented to the committee. It should be noted that this program, having been founded in the United States, the NCCN guidelines are used to accredit it as a specialized rectal cancer center.

The regimen used for neoadjuvant therapy combines RT (to be discussed in the corresponding section) with oral capecitabine (825 mg/m^2 twice daily during RT days) or 5-fluoracil (225 mg/m^2 per day) in patients who cannot receive capecitabine.

MDT RECTAL CANCER

Date: Name: Age: Operation:
Phone: Date:
H.C: Surgeon: Oncologist: Type of surgery:
Familial history of cancer: Approach:
Location: Recurrence (Yes/No): Stoma:
Diagnosis date: Post-Operative complications:
Colonoscopy date and report: Staging (TNM):
Pathology report (outside/CEMIC): Specimen photo (Yes/No):
CEA and CA 19-9 pre tx:
MRI Staging (first): Recommendation:
Sphincter involved (first): Neoadyuvance:
CRM Involved (first): Adjuvance:
Distance from anal verge (first): Palliative treatment:
CT for systemic staging (first):
MRI for liver (first):
PET Scan (First):
Previous treatment:

Neoadyuvant Treatment (Yes/No):
Chemotherapy:
Radiotherapy:
End date:
Adverse events:

Re staging date and time after finishing neo-adyuvant therapy:
CEA and CA 19-9 pre tx:
MRI Staging:
Sphincter involved:
CRM Involved:
Distance from anal verge:
CT for systemic staging:
MRI for liver:
PET Scan:
Type of cancer (histology):

Figure 2. Patient clinical file presented to a multidisciplinary committee (adaptation of the file used by the Cleveland Clinic, Florida, United States)

At present, a neoadjuvant treatment scheme different from the conventional one has been proposed, called "Total Neoadjuvant Therapy",[13,14] which aims to carry out the complete chemotherapy treatment scheme prior to surgery, and within the committee we are carrying out currently the first experiences with this new line of treatment.

Finally, postoperative chemotherapy is indicated for patients who have undergone surgery for advanced tumors and have not received previous treatment, and for those categorized after the postoperative study of the specimen as high-risk stage II or III, according to the classification of the patient by AJCC. These patients receive a regimen based on fluopyrimidines, with or without oxaliplatin.

Diagnostic Imaging

Imaging studies play a fundamental role, since they will directly affect the staging of the tumor and, therefore, the choice of the corresponding treatment.

For all this, the program requires that at least 90% of diagnostic studies be reported by a specialist who is accredited as part of the multidisciplinary team.

Both the imaging protocol and standardized report templates are based on the Society for Abdominal Radiology guidelines[15-17].

Staging

The guidelines established by the AJCC classification[8] are followed for staging patients.

The location and relationship (distance) with the external anal margin, the sphincter/anorectal junction complex, and the anterior peritoneal reflex are evaluated. Morphology, dimensions in the three planes and characteristics of the signal (mucinous component) are also detailed.

Regarding the T- variable, the T2-weighted images are evaluated, determining the involvement of the different layers of the rectal wall (mucosa, submucosa and muscularis propria) and its extramural extension measured in millimeters, as well as its relationship with neighboring organs and structures (sphincter complex in the case of tumors of the lower rectum).

For extramural vascular invasion, the classification established by Gina Brown[18] is taken into consideration.

In relation to variable N, the size and location of the lymph nodes are determined, as well as the characteristics of their margins, signal and morphology. The presence of mesorectal tumor deposits is also taken into account.

Finally, the mesorectal fascia is considered free when a distance greater than or equal to 1 mm is seen from the tumor, lymph nodes, or satellite deposits.

Re-staging

When analyzing the images of patients who have already received treatment, a comparative evaluation of the characteristics of the primary tumor is made in relation to its behavior in diffusion sequence and the signal changes it presents in TSE T2 sequences linked to a fibrous and/or mucinous component, establishing the degree of tumor regression.

Lymphatic structures are examined, evaluating changes in the characteristics described in the baseline examination and determining the presence of new adenopathies. Finally, the Mandard score[19,20] is used to report the degree of response to neoadjuvant treatment.

Figure 3 shows a rectal adenocarcinoma magnetic resonance image (MRI) before and after finishing neoadyuvant treatment.

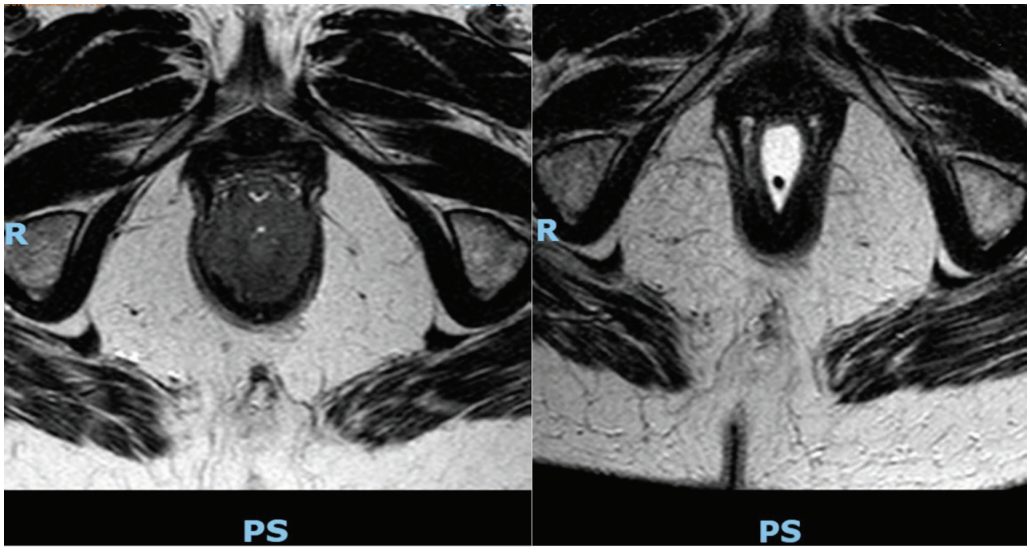

Figure 3. MRI staging of rectal adenocarcinoma pre-neoadjuvant therapy (left) and post-neoadjuvant therapy (right)
MRI: Magnetic resonance image

Colorectal Surgery

The specialization and centralization of rectal cancer surgery is directly associated with the morbidity and mortality of the procedures, and with the patients' prognosis.[21-24]

For this reason, in the department of surgery, these type of procedures are performed exclusively by a senior colorectal surgeon assisted by a junior colorectal surgeon. This represents a requirement to accredit the program: 80% of all procedures in patients with rectal cancer must be performed by a specialized surgeon who is also part of the committee.

The surgical protocol is carried out following the guidelines of the "Standardized Synoptic Operational Report Committee (OSTRiCh)[25,26]. This synoptic summary includes data such as type of anastomosis, level of mesenteric vessel ligation, pneumatic test (whether performed or not, type) and 95% of the protocols for patients operated on at the institution must have been written following this protocol.

The result of the surgery should be discussed in committee, comparing the intraoperative findings with the result of the pathology protocol.

Oncology Radiotherapy

RT has become one of the fundamental pillars of rectal cancer treatment. An adequate selection of patients associated with a correct implementation and execution of this therapy is essential for the approach to these patients.

RT, in its different techniques, fractionations and modalities, is intended to treat rectal cancer, due to its action in the microenvironment of the neoplastic cell, affecting its replication and survival due to different intra- and extra-cellular effects. Due to the duration of the therapy, treatments may be long-term (25-28 days) or short-term (5 days).

Different publications support the usefulness of RT in mid- and low-rectal cancer patients and its indications in different clinical scenarios.

To perform these treatments at our institution we have high-tech equipment and appliances that allow us to perform different techniques:

- Three-Dimensional Conformal Radiotherapy;
- Intensity Modulated Radiation Therapy;
- Volumetric intensity modulated radiation therapy by VMAT arches;
- Image Guided Radiation Therapy;
- Body Stereotactic Radiosurgery.

The effectiveness of these treatments and the minimization of side effects are closely linked to the technology used, which is why we use a linear accelerator that allows complex treatments to be carried out with the highest radiation dose adjustment and maximum protection of the organs that adjoin the areas to be treated. This unit is a Varian Trilogy model that was the first linear accelerator to offer synchronized images. Its On-Board Imager® (OBI) kV imaging system provides various imaging modalities, including kV, MV, CBCT, and fluoroscopy. Clinicians obtain high-quality images of soft tissue, bone anatomy, or other markers for optimal patient positioning. In addition, OBI allows you to use radiographic, fluoroscopic, and CBCT modes to control the size, shape, and location of the target.

As a planning system, and using the systems and techniques described above, we can quickly and accurately plan the treatments, by reconstructing the patient in 3D using the planning computed tomography image and merge it with other imaging modalities such as positron emission tomography and MRI, managing to expand information for a better quality of treatment.

Statistical Analysis

The software Stata (Statistical data analysis), version 11.1, was used for the analyses (Statacorp, College Station, Texas, USA). Categorical variables are described as percentages whereas numerical variables are described as median and range.

Results

In a period of four months from the beginning of program activities, 15 patients were presented at a monthly multidisciplinary committee meeting with 87.5% of the program members present.

The main characteristics of the patients are summarized in Table 1.

Eleven patients with locally advanced rectal adenocarcinoma were presented in committee:

- Five patients with lower rectal tumors underwent surgery after finishing neoadjuvant treatment without a complete clinical response.
- One patient received conventional Miles surgery for a locally advanced rectal tumor at another hospital, and it was decided to undergo adjuvant chemo-radiotherapy.
- Two female patients presented after completing neoadjuvant treatment for tumors of the middle and lower rectum. Of these, one presented with a complete clinical response (with subsequent follow-up), while the other presented with progression at the systemic level (with subsequent systemic treatment).
- One patient was re-staged after neoadjuvant treatment, Miles laparoscopic surgery for adenocarcinoma with invasion of the anal sphincter complex and adjuvant treatment (with subsequent follow-up).

Table 1. Patient characteristics

Variable	Percentage
Median (range) age (years)	69 (44-86)
Female sex	47.06 (8/17)
Location	
Upper rectum	17.65 (3/17)
Medium rectum	17.64 (3/17)
Lower rectum	64.70 (11/17)
Histology	
Adenocarcinoma	94.11 (16/17)
Neuroendocrine tumor	5.89 (1/17)
Adenocarcinoma - stage	
Early tumor	18.75 (3/16)
Locally advanced tumor	68.75 (11/16)
Metastatic tumor	12.50 (2/16)
Neoadjuvant therapy	75 (12/16)
Complete clinical response	8.33 (1/12)
Surgical Treatment	76.47 (13/17)

- One patient was diagnosed with a locally advanced low rectal tumor with invasion of the sphincter complex (neoadjuvant).

- Eight weeks after ending neoadjuvant treatment, one female patient presented with a tumor of the lower rectum with an almost complete response (and the plan was to repeat the studies at 12 weeks).

Two female patients presented with metastatic disease at diagnosis:

- One patient underwent neoadjuvant therapy and subsequently underwent low anterior resection + single liver metastasectomy.

- One patient had multiple liver metastases at the time of presentation to the committee (and underwent subsequent chemotherapy).

Two patients with adenocarcinoma of the upper rectum and one patient with a neuroendocrine tumor were presented in committee without evidence of locally advanced disease or distant metastases and were planned for surgery.

All patients were duly registered, and the specimen photographs of those operated on were attached to the corresponding clinical record.

Discussion

The aim of this article is to present an initial experience of a newly formed multidisciplinary group treating patients with rectal cancer in a lower income country, following the guidelines of a North American program. However, it must be mentioned that the way patients are managed in low-income countries might be different from that of countries such as United States, and this aspect should be taken into consideration while assessing the feasibility of using NAPRC's standards.

To begin with, given that centralization of care is an issue in underdeveloped countries, the volume of patients who are treated in a center seeking for accreditation might be lower. Then, periodicity of meetings required within the standards should be modified according to this reality. Another problem that arises is the fact that the same patient can be operated in one institution while receiving neoadjuvant or adjuvant treatment in another institution. Even when a hospital has facilities to offer chemotherapy treatment, it may not have the equipment to perform radiotherapy. This is not the case in our institution, but it is a reality evident in any low-income country, and a possible modification of the program suggesting ways to perform multidisciplinary treatment of patients, including professionals from different institutions should be considered.

Lastly, lack of access to high-quality technology, especially when it comes to MRI and radiotherapy equipment, might be a concern.

However, we believe that the adoption of this program with the purpose of standardizing and favoring the multidisciplinary approach of patients with rectal cancer is feasible but would probably require adaptations in low-income countries. Nevertheless, this approach appears to be useful and may have a direct impact on improving the quality of the care, with consequent improvement in the results of the treatment and in the experience of the patient, during their treatment.

Conclusion

Current evidence demonstrates the importance of multidisciplinary management of patients with rectal neoplasms. Therefore we believe that the basic precepts of the NAPRC can be used in hospitals in developing countries to standardize and improve the care of these patients. Although formal accreditation is not available outside the United States, we do not rule out that in the future, and adapting the requirements to the reality of foreign hospitals, a similar program could be proposed to lay the foundations for multidisciplinary management programs of rectal tumors in hospitals in low-income countries.

Lastly and importantly, the impact of using these guidelines in terms of clinical and oncological results of patients with rectal cancer is yet to be evaluated and will require larger and longer-term studies.

Ethics

Ethics Committee Approval: This manuscript was performed following international guidelines for data protection, and all patients involved signed an informed consent to share their anonymized information for investigation purposes.

Informed Consent: All patients involved signed an informed consent to share their anonymized information for investigation purposes.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: N.L.A., S.A., J.G., M.A.I., R.C., G.E., N.R., A.C., Concept: N.L.A., S.A., D.F., R.C., N.R., A.C., Design: N.L.A., J.G., M.A.I., G.E., Data Collection or Processing: N.L.A., S.A., D.F., A.C., Analysis or Interpretation: N.L.A., J.G., M.A.I., D.F., R.C., G.E., N.R., A.C., Literature Search: N.L.A., S.A., D.F., R.C., N.R., A.C., Writing: N.L.A., S.A., J.G., M.A.I., R.C., G.E., A.C.

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