A Way to Start Transanal Total Mesorectal Excision for Rectal Cancer

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Abstract

Introduction The optimal rectal cancer care is achieved by a multidisciplinary approach, with a high-quality surgical resection, with complete mesorectal excision and adequate margins. New approaches like the transanal total mesorectal excision (TaTME) aim to achieve these goals, maximizing the sphincter preservation ratio, with good oncologic and functional results. This report describes a way to implement TaTME without a proctor, presents the first case series of this approach in a center experienced in rectal cancer, and compares the results with those of the international literature.

Methods We performed a retrospective study of the first 10 consecutive patients submitted to TaTME for rectal cancer at our institution. The primary outcomes were postoperative complications, pathological specimen quality and local recurrence rate. The results and performance were compared with the outcomes of a known structured program with proctorship and with the largest meta-analysis on this topic.

Results All patients had locally advanced cancer; therefore, all underwent neo-adjuvant therapy. A total of 30% had postoperative complications, without mortality or re-admissions. In comparison with the structured training program referred, no differences were found in postoperative complications and reintervention rates, resulting in a similar quality of resection. Comparing these results with those of the largest meta-analysis on the subject, no differences in the postoperative complication rates were found, and very similar outcomes regarding anastomotic leaks and oncological quality of resection were registered.

Conclusion The results of this study validate the safety and effectiveness of our pathway regarding the implementation of the TaTME approach, highlighting the fact that it should be done in a center with proficiency in minimally invasive rectal surgery.

Keywords
- rectal
- cancer
- surgery
- trans-anal
- formation

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Introduction

Colorectal cancer is the second most frequent type of cancer in Europe, with about half a million cases in 2018, and the second most common cause of death by cancer in men and the third in women.[1] For the treatment approach to rectal cancer, a discussion in a multidisciplinary meeting is essential. The treatment is dependent on the combination of neoadjuvant therapy and the quality of surgical resection, both aimed at minimizing the recurrence rate and improving disease-free survival.[2,3] An optimal surgical resection requires the complete mesorectal excision (without lesion of the mesorectal fascia), preservation of adequate margins (distal and radial), and adequate lymphadenectomy.[4–6] Regardless of the chosen approach, rectal surgery remains a surgical challenge.

Rectal surgery extends for more than 200 years, and it can be split into five stages according to its advancement and innovation through time[7]:

I. Local resection (1739–1908): started by the French surgeon Faget, in 1739, and improved by the British Allingham, in 1879;
II. Abdominoperineal resection (with definitive terminal colostomy) (1908–1939): performed by Miles in 1908, it decreased the recurrence rate from roughly 100 to 30%.[8]
III. Sphincter-sparing resection (1939–1979): represented by the Dixon procedure (anterior resection of the rectum), avoiding a definitive colostomy. Only in the late 70s, the introduction of adjuvant therapies and mechanical sutures lessened the extensive technical difficulties of this type of procedures, reducing the frequency of Miles procedures.
IV. Total mesorectal excision (TME) (1979–1990): described in 1982 by Heald[9] and, since then, universally accepted as the standard of treatment for cancer in the middle and lower rectum.
V. Minimally invasive surgery (1990–present): first performed in 1991 by Jacobs, evolving to the widespread use of laparoscopy.

Whichever the chosen surgical approach, lower rectal surgery presents numerous difficulties, mainly caused by the insufficient visualization during pelvic dissection, aggravated in obese or male patients with smaller pelvises. These handicaps can result in greater rates of positive resection margins and substandard lymph-node harvest.[10]

The aim of hybrid approaches for the treatment of lower rectal cancer is to ensure sphincter preservation and adequate function, without sacrificing the quality of the resection (mainly the distal and radial margins). Dr Gerald Marks developed, in 1984, the Transabdominal transanal (TATA) proctosigmoidectomy initiating the TME dissection transanally.[11,12] Transanal total mesorectal excision (TaTME) extends the TATA's principle of bottom-up dissection to a minimally invasive procedure, using the general principles and equipment of laparoscopic surgery. Sylla and Lacy first described the TaTME in 2010 followed by an early case series of 20 patients, and posteriorly validated the technique in a series of 140 patients.[10,13,14]

Transanal total mesorectal excision absolutely changes the traditional approach and landmarks of radical rectal surgery to a bottom-up technique. Such modification recommends an appropriate education of this new technique.

This article aims to demonstrate a pathway to implement TaTME in a center proficient in minimally invasive rectal surgery and validate the safety and efficacy of this approach. Regarding this objective, we reviewed the first TaTME procedures performed in our institution, a national reference center for the treatment of rectal cancer, from 2018 to 2020, and compared the outcomes with the results presented in the international literature, in particular the data of a standardized training program.

Methods

Introduction of the Technique

As mentioned, TaTME is a relatively new technique, therefore its introduction in our daily practice requires proper training and ideally expert supervision during the first cases. In our Country there isn't a structured program to initiate TaTME. In Europe, one of the best-known programs in this regard is led by the Amsterdam University Medical Center, which coordinates intensive courses and a clinical proprietorship program. Their structured training pathway and proctoring[15] is a multiple step program of e-learning, didactic courses, observation of a TaTME live procedure, hands-on cadaver workshops, and first cases of proctored TaTME. To enter this program, all colorectal surgeons had to have at least 50 laparoscopic TME cases, transanal minimally invasive surgery (TAMIS) experience, case volume (the number of TaTME cases should be at least 20/year/center), and adequate medical instruments (continuous air insufflation system, adequate transanal platform, and possibility to perform a two-team approach).

In our center, two surgeons started their training with e-learning and surgical videos. Afterwards, they went to presential theoretical and practical courses of TAMIS and TaTME, with TaTME live procedure observation. All surgeons involved in the rectal surgeries had laparoscopic TME experience, and some had TAMIS experience. Our hospital is a national reference center for the treatment of rectal cancer, with a case volume of more than 50 rectal surgeries/year, and with all the medical instruments listed above, except continuous air insufflation system.

Patients

All patients are discussed in a multidisciplinary meeting, and our practice follows the international guidelines. The diagnosis is established by biopsy during a colonoscopy. In the cases in which a total colonoscopy was not possible, we performed virtual colonoscopy. Staging is done with a pelvic magnetic resonance imaging (MRI) and computed tomography (CT) of the thorax and abdomen. In those cases in which MRI is contraindicated or doubtful, the investigation is conducted by echoendoscopy. Patients' reassessment after chemoradiation is made routinely by MRI.

Surgical Procedure

The surgical approach is defined at the surgical meeting with all surgeons of the colorectal team. All patients are submitted to mechanical bowel preparation with oral antibiotic prophylaxis (erythromycin 1 gr 3 doses). Endovenous antibiotic prophylaxis is universal—cefoxitin 2 gr + metronidazole 1 gr at anesthesia induction—as well as thromboembolism prophylaxis with low weight heparin on the previous day and compression stocks during the surgery.

The surgical approach is performed by two teams. There were different members of the colorectal team performing the abdominal approach, although the TaTME approach was always performed by the same surgeon, to maximize the surgical expertise. The surgical technique follows the steps previously described by Arroyave et al.,[16] with minor differences. We only use the Lone Star retractor when having difficulties placing the transanal platform or whenever we perform a manual coloanal anastomosis. Additionally, we execute the rectal cerclage with 00 polypropylene, due to the size of the needle. The anastomosis is preferably done mechanically with a circular stapler (EEA - Medtronic, Minneapolis, MN, USA). The creation of a stoma derivation considers the known risk factors for anastomotic leak, and an ileostomy is the preferred method of derivation. At the end of the surgery, a tube is commonly left, placed transanally through the anastomosis, with the intent of reducing the bowel inner resting pressure.

After the surgery, the patients were submitted to a fast-track recovery program according to the Enhanced Recovery After Surgery (ERAS) Society recommendations.[17]

Study Design

This is a retrospective study based on the clinical data of the operated patients. All patients submitted to TaTME in our center from the introduction of the technique until April 2020 were included, totaling 24 months. Patients previously submitted to other transanal or abdominal surgeries were deemed to be fit for inclusion.

Outcomes

Our primary outcomes were patient complications, pathological specimen quality (margins and completeness of mesorectum), and local recurrence rate. The secondary outcomes included surgical time, conversion rate, and length of hospital stay. We compared our performance with the outcomes of the referred Dutch structured training program[15] and with the data of the knowable largest meta-analysis from the literature on this regard.[18]

Statistical Analysis

The statistical analysis was performed using the IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp., Armonk, NY, USA). A p-value ≤ 0.05 was considered statistically significant. The categorical variables are displayed as frequencies and percentages, and the continuous variables are shown by mean and standard deviation (mean $\pm$ standard deviation) or median and Q1–Q3 quartiles (median [Q1; Q3]). The missing data were excluded. For the categorical variables, the Chi-Squared test or the Fisher exact test, when appropriate, were used. The distribution of continuous variables was appraised with the Kolmogorov-Smirnov test or skewness and kurtosis, t-test, or the Mann–Whitney U-test was conducted, as suitable.

Results

Our Series

A total of 10 patients were included in our series (►**Table 1**), 5 females and 5 males with a mean age of 65.5 $\pm$ 11.5 years old. Most of them (60%) had had previous surgeries: two had colon surgeries due to complications of diverticular disease; one had surgery for a gallstone ileus; one had an umbilical hernia repair; and two patients had been previously submitted to TAMIS due to polypoid lesions.

All our patients had locally advanced rectal cancers; therefore, according to the guidelines, all had indication to neoadjuvant chemoradiation therapy (CRT). A T4 case was related to an intimate contact between the neoplasm

Table 1 Patient Characteristics of our series

Patient Characteristics	n (%)
Sex (Male/Female)	5/5 (50%/50%)
Age (years)	66.5 $\pm$ 11.49
BMI (Kg/m^2)	24.76 $\pm$ 9.56
Previous abdominal surgery	4 (40%)
Previous trans-anal surgery	2 (20%)
Distance from the tumor to the anal verge (mm)	5.3 $\pm$ 1.25
360° circumferential invasion	6 (60%)
Tumor T stage	
• T1	–
• T2	–
• T3	9 (90%)
• T4	1 (10%)
Tumor N stage	
• N0	1 (10%)
• N positive	9 (90%)
Neoadjuvant therapy	
• RT	1 (10%)
• CRT	9 (90%)
Time (weeks) between the end of RT and re-staging	8.56 $\pm$ 2.30
Reassessment after neodjuvant treatment	
Tumor T stage	
• T1	3 (33.33%)
• T2	6 (66.66%)
Tumor N stage	
• N0	8 (88.88%)
• N positive	1 (11.11%)

Table 2 Patients surgeries characteristics of our series

Patient Characteristics – Surgery	n (%)
Time between neoadjuvant treatments and surgery (weeks)	13.11 ± 4.11
Type of surgery	
• TaTME with LAR	9 (90%)
• TaTME with multiorganic resection	1 (10%)
Duration of surgery (min)	241 ± 41
Laparoscopic abdominal surgery	8 (80%)
Conversion to open	3 (37.5%)
Splenic flexure liberation	3 (30%)
Type of anastomosis	
• Stapled	9 (90%)
• Hand sewn	1 (10%)
Specimen extraction	
• Laparotomy	5 (50%)
• Transanally	5 (50%)
Stoma (diverting ileostomy)	8 (80%)
Anal decompression bougie	8 (80%)

Table 3 Postoperative evolution of our series

Post-operative evolution	n (%)
Complications	3 (30%)
• Clavien-Dindo grade 1	1 (33%)
• Clavien-Dindo grade 2	–
• Clavien-Dindo grade 3	2 (66%)
• Clavien-Dindo grade 4	–
Re-intervention	2 (20%)
Hospital stay (days)	8.5 (6;28)
Hospital stay (without complications - days)	7 (6;10)
Re-admission	0 (0%)
30-day mortality	0 (0%)

and the prostate. The standard treatment in our center is a long radiotherapy scheme combined with 5-Fluorouracil; this treatment was completed in 9 cases, and the remaining one was submitted to radiotherapy only due to previous medical conditions. In the re-assessment after CRT, all patients had some degree of response. In one case, due to technical issues, it was not possible to perform a good quality re-assessment.

The surgical approach (►**Table 2**) is set to take place regularly 12 weeks after the end of neoadjuvant treatment. In this group, it took place sometime later, at 13.11 ± 4.11 weeks. The mean surgical time was ∼ 4 hours, and the standard abdominal approach was laparoscopic. In this series, two cases were approached primarily by laparotomy, both with two or more previous abdominal interventions by laparotomy. Two of all the three conversion cases matched the first two cases performed. They were difficult cases, with high BMI and low pneumoperitoneum space. The other conversion was motivated by the need to perform a multiorganic resection in a bulky tumor with involvement of the left colon, ileum, and appendix, besides the rectum. The patient staged pretherapeutically as T4, had fibrosis in the anterior mesorectal fascia, adjacent to the prostate, and an iatrogenic lesion to the prostatic urethra was made. The lesion was easily seen with this approach and repaired by the TaTME team with manual suture.

Almost all anastomoses were performed with a circular stapler (90%). The splenic flexure liberation was only performed when the remaining colon did not arrive freely to the pelvic floor. In one case, a critical failure occurred during the anastomosis with incomplete stapling. The option was to remove both the end stumps and to perform a new anastomosis. The specimen was extracted transanally in all the surgeries completed by laparoscopy. A diverting stoma (ileostomy) was proposed to all patients of this series and performed in all of those who accepted it (80%).

The postoperative evolution is described in ►**Table 3**. Three patients (30%) developed complications: one surgical wound infection controlled with bedside drainage; one pelvic hematoma and bladder catheter exteriorization occurred in the patient with the urethra lesion, and it was treated with surgical exploration, bladder catheter hand-guided placement, and pelvic drainage; there was also one case of anastomotic leak. This last case occurred in a patient that previously refused a stoma; therefore, he was re-operated to drain the abscess and perform a diverting stoma.

The median hospital stay was 7 days, substantially increased by the occurrence of complications.

We have no record of mortality or re-admissions.

The specimen findings (►**Table 4**) demonstrated a complete mesorectum in all cases, with 2 presenting laceration (20%), due to fibrosis associated with neoadjuvant treatment. One of them corresponds to the patient with the urethra injury, a sign that a fibrosis-induced injury would be difficult to prevent and could be the justification of the laceration. The shortest margin of the series was 10 mm, and the mean margin was 20.66 ± 10.17 mm. The number of lymph nodes retrieved in the specimen was superior to 12 in all patients except one, who nonetheless had a complete mesorectum. Two patients had a complete pathological response to neoadjuvant therapy.

With a mean follow-up of 14.19 ± 10.46 months, none of the patients showed signs of local recurrence (►**Table 5**).

Comparison with a Structured Training Pathway Implemented in Netherlands[15]

The referred report presented data of a total of 120 patients, corresponding to the first 10 TaTME performed by different teams in 12 different hospitals, during the implementation of a structured program of formation by the Amsterdam University Medical Center. We believe that it is well suited to the

Table 4 Specimen findings of our series

Specimen findings	n (%)
Tumor T stage	
• T0	2 (20%)
• T1	–
• T2	5 (50%)
• T3	3 (30%)
• T4	–
Tumor N stage	
• N0	8 (80%)
• N1	2 (20%)
Harvested lymph nodes	18.83 ± 6.55
Distal margin (mm)	20.66 ± 10.17
Radial margin (mm)	4.13 ± 3.80
R0 resection	10 (100%)
Mesorectum status	
• Complete	8 (80%)
• Lacerated	2 (20%)

Table 5 Follow-up of our series

Follow-up	
Time of follow-up (months)	14.19 ± 10.46
Local recurrence	0 (0%)

purpose of this article to compare the first 10 TaTME procedures performed in our institution with the first 10 TaTME procedures performed in other hospital centers.

Only a few differences in the patients' characteristics can be identified in ►**Table 6**, although most of them did not reach the statistical cut-off. In this regard, it is clear that a greater percentage of the patients treated at our hospital were previously submitted to other surgeries, open (40% vs 24.2%) or transanal (20% vs 4.2%). The initial clinical stage was lower in our group with no T1 or T2 patients and, therefore, the need for neoadjuvant therapy was universal, versus 65.8% of this patients in the Netherlands group ($p = 0.0302$). A statistical difference was also reached in the subgroup of patients submitted to CRT ($p = 0{,}03$).

Regarding the surgery, there were no differences in the type or duration of the procedures performed, but we registered a lower rate of laparoscopic surgery 80% vs 99.2% ($p = 0.0154$) and higher conversion rate 37.5% vs 4.2% ($p = 0.0182$). This is justified by the patients' surgical history and the locally advanced disease. This higher rate of open surgery justifies some of the differences presented in the specimen extraction. The specimen extraction was done according to the size of the tumor, being performed by a midline incision under the umbilicus or in the diverting ileostomy site. In half of the cases the extraction was done transanally. Regarding the type of anastomosis and the performance of a diverting stoma, there were no differences to report.

There were no differences in the postoperative evolution of any group, with similar complication and re-intervention rates.

The pathological specimen findings were very similar in both groups, with no statistical differences in the number of lymph nodes retrieved and the mesorectum status. Although without statistical difference, we can see that our group of patients had a lower T status on the specimen analysis, probably due to the higher percentage of neoadjuvant treatments.

Comparison with One of the Largest Meta-Analysis About this Subject, that Included 2,048 Patients of Whom 1,000 were Submitted to TaTME Published by Hajibandeh et al.[18]

The comparison between our series and this extensive meta-analysis report (►**Table 7**) showed no differences in complication rates, with very similar results regarding anastomotic leak. The oncologic quality of the specimen was also very similar regarding the rates of completeness of mesorectal excision, the number of lymph nodes harvested, and distal margin. Although there was a statistical difference in the circumferential resection margin ($p = 0.0018$), we do not see this as an inferior result, since all patients had a local advanced tumor, and a complete or near complete mesorectal excision with R0 resection was archived in all cases. The duration of the procedures was similar: around 4h to 4:30 h. The convention rate was substantially higher in our series ($p < 0.001$).

Discussion

Total mesorectal (TME) excision is a difficult procedure, especially in obese, male patients and those with distal tumors, even in experienced hands, once the mesorectal plane and distal margin are often inaccessible. The transanal approach facilitates rectal surgery in these challenging cases by placing the surgeon in front of the tumor, allowing a direct exposure to the lesion, a proper rectal section with a precise safety margin and a meticulous distal mesorectal dissection. With all these advantages, the TaTME approach was introduced in 2010 and seemed particularly beneficial for mid and low rectal tumors. It has particular utility in difficult cases, such as patients with narrow or deep pelvises, increasing anus and anal sphincter preservation. This approach has been validated by numerous groups and studies, such as the "International multicentre prospective audit of elective rectal cancer surgery; operative approach versus outcome, including transanal total mesorectal excision (TaTME)",[19] which compares the open, laparoscopic, robotic, and TaTME approaches, with extensive data and outcomes not very different from ours.

This approach is, however, quite challenging, due to the fact that it changes the surgeon's perspective, eliminating the traditional landmarks. For that reason, it is important to

Table 6 Comparison between our and Netherlands series

Patient Characteristics	Our series - 10 patients n (%)	Netherlands series - 12 × 10 patients n (%)	*p*
Sex (Male/Female)	5/5 (50/50)	91/29 (75.8/24.2)	0.126
Age (years)	66.5 ± 11.49	65.4 ± 9.9	0.739
BMI (Kg/m^2)	24.76 ± 9.56	26.9 ± 4.0	0.121
Previous abdominal surgery	4 (40%)	29 (24.2%)	0.273
Previous trans-anal surgery	2 (20%)	5 (4.2%)	0.091
Distance to the anal verge	5.3 ± 1.25	6.9 ± 3.1	0.986
Tumor T stage			0.4
• T1	–	6 (5.1%)	–
• T2	–	23 (19.5%)	–
• T3	9 (90%)	87 (73.7%)	–
• T4	1 (10%)	2 (1.7%)	–
Neoadjuvant therapy	10 (100%)	79 (65.8%)	0.030
Type of surgery			1
• TaTME with LAR	9 (90%)	110 (91.7%)	–
• TaTME with multi organic resection	1 (10%)	0	–
• Intersphincteric	0	10 (8.3%)	–
Duration of surgery (min)	241 ± 41	293 ± 92.6	0.081
Laparoscopic abdominal surgery	8 (80%)	119 (99.2%)	0.015
Conversion to open	3 (37.5%)	5 (4.2%)	0.018
Type of anastomosis			0.45
• Stapled	9 (90%)	93 (94.9%)	–
• Hand sewn	1 (10%)	5 (5.1%)	–
Specimen extraction			< 0.001
• Laparotomy	5 (50%)	5 (4.2%)	–
• Transanally	5 (50%)	31 (25.8%)	–
• Other	0 (0%)	84 (70%)	–
Diverting stoma	8 (80%)	100 (83.3%)	0.677
Complications	3 (30%)	54 (45%)	0.512
• Clavien-Dindo grade 1/ 2	1 (33%)	31 (57.4%	1
• Clavien-Dindo grade 3	2 (66%)	23 (42.6%)	1
Re-intervention	2 (20%)	16 (13.3%)	0.629
30 day mortality	0 (0%)	0 (0%)	NA
Tumor T stage			0.574
• T0	2 (20%)	9 (7.6%)	–
• T1	–	16 (13.6%)	–
• T2	5 (50%)	32 (28.8%)	–
• T3	3 (30%)	59 (50%)	–
Harvested lymph nodes	18.83 ± 6.55	17.0 ± 7.2	0.439
R0 resection	10 (100%)	114 (95%)	1
Mesorectum status			0.324
• Complete	8 (80%)	107 (89.2%)	–
• Lacerated	2 (20%)	13 (10.8%)	–

Table 7 Comparison between specimen findings of our and Hajibandeh et al. series

Variable	Our Serie n/total (%)	Hajibandeh et al. series n/total (%)	*p*
Intraoperative complications	1/10 (10%)	31/411 (7.54%)	0.55
Postoperative complications	3/10 (30%)	338/975 (34.67%)	1
Anastomotic leak	1/10 (10%)	84/871 (9.64%)	1
Surgical Site Infections	1/10 (10%)	10/263 (3.8%)	0.342
R0 resection	10/10 (100%)	923/962 (95.95%)	1
Completeness of mesorectal excision	8/10 (80%)	380/493 (77.08%)	1
Number of harvested lymph nodes	18.83 ± 6.55	17.59 ± 8.92 ($n = 487$)	0.662
Distal resection margin (mm)	20.66 ± 10.17	23.55 ± 15.63 ($n = 488$)	0.561
Circumferential resection margin (mm)	4.13 ± 3.80	10.32 ± 6.20 ($n = 363$)	0.002
Positive circumferential resection margin	0/10 (0%)	53/877 (6.04%)	1
Duration of surgery (min)	241 ± 41	275 ± 100 ($n = 536$)	0.284
Conversion to an open procedure	3/8 (37.5%)	13/930 (2.04%)	< 0.001

educate and prepare surgeons for this new approach, to improve surgical and oncologic results and minimize complications.

This paper aims to evaluate the introduction of the TaTME approach in our hospital. After the mentioned training, we started this approach in difficult cases, in which the probability of a definitive stoma was substantial. These were perceived due to the sparce distance between the tumor and the anal verge or the presence of a locally advanced low tumor. To illustrate this position, our first case was an obese patient with a Rullier type-II neoplasm that decisively refused a stoma, the second patient had a Rullier Type-I neoplasm and also refused a stoma, and the third patient had previous abdominal surgeries due to complicated diverticular disease and had a low rectal neoplasm with an intimate contact with the prostate. We presume that that was the reason for the converted surgeries and complications to be concentrated in our first three patients. The complication rate was getting better as the experience increased, with no postoperative complications in the last seven cases. Despite this fact, the conversion rate of 30% is according to the international registry series of TaTME.[10,20]

There was no re-admission or mortality in the presented data. This indicates a safe implementation pathway of this new approach, and suggests that with expertise and proper training, five cases should be enough to acquire proficiency, as demonstrated in other studies.[10]

The mean operative time in our series was $\sim$ 241 minutes, lower than the referred in some reference hospitals,[10] which could be justified by the two-team approach, with the abdominal and transanal procedures being done at the same time, and the transanal procedure being performed by the same surgeon. Nevertheless, we found some surgical adversities related to anesthetic technique that inhibited rectal relaxation, making the transanal approach harder, and technical problems due to the lack of an optimum insufflation system with continuous gas flow and automatic smoke evacuation.

The specimen findings were also encouraging. The average harvested lymph nodes were 19, superior to the recommended 12, with a complete R0 resection on all operated patients. The distal resection margin was 20.7 mm, in average, and we attribute this good distal margin to the visualization of the lesion at the beginning of the procedure, correctly marking the section area. In our perspective, this is important, as it allows a safe oncological resection and, at the same time, maximizes the rectum spared to allow the best defecatory function possible.

To have a more realistic and faithful assessment, we compared our outcomes with the data of other centers that had also introduced this approach. We selected a multicenter study that similarly analyzed the first 10 TaTMEs done in different hospitals.[10] It is apparent that our data had more difficult patients, with more previous abdominal (40% vs 24%) or transanal (20% vs 4%) surgeries, lower tumors (distance to the anal verge 5 cm Vs 7 cm), more locally advanced neoplasms (just T3 or T4 tumors) and more frequently with neoadjuvant therapy (100% vs 65.8%), which could determine more complex procedures. Consequently, we had lower numbers of laparoscopic surgery (80% vs 99%) and more conversions to open surgery (38% Vs 4%). Despite such conditions, the surgeries were faster (241 min Vs 293 min) and had fewer complications (30% vs 45%). In general terms, there were no statistical differences between the surgeries, postoperative evolution, and specimen findings in both series. These results suggest that our training and implementation pathway resulted in a safe introduction of the technique, without major complications and results comparable to those of other centers in Europe.

Compared with one of the largest meta-analyses that included 1,000 patients submitted to TaTME conducted by Hajibandeh et al.,[18] we only observed a statistical difference on the circumferential resection margin (4 mm vs 10 mm)

and the conversion to open procedure (37.5% vs 2%). These factors did not compromise the oncologic outcomes and show that there is probably a learning curve with difficult cases. Analyzing other aspects, such as the duration of surgery, complications, and specimen findings, R0 resections, completeness of mesorectal excision, number of harvested lymph nodes and resection margin, we did not identify any difference between our small initial data and this larger data. These results are encouraging, showing that although we did not have a proctor, which creates an invaluable advantage, we showed good results in surgical and oncological outcomes, having a low complications rate and good quality of resection and specimens. The technical expertise of a colorectal team in a national reference hospital center for the treatment of rectal cancer, the training preparation, and the concentration of TaTME procedures in one surgeon could explain these results.

Conclusion

The present study compares the results achieved on implementing TaTME in terms of intraoperative and postoperative complications and pathology outcomes between our center and others centers whose surgical teams trained on a structured training pathway. The main difference relies on the existence of a nationwide structured training program with proctorship for TaTME in the Netherlands, while our center has trained surgeons in colorectal laparoscopic surgery organized in a colorectal unit and established as a national reference center for the treatment of rectal cancer but lacking an organized training program. The results show no significant difference between the centers. Although we recognize that an established training program with proctorship is of added value when implementing a new technique, it is safe to implement TaTME taking into account the existence of a dedicated and experienced team in minimally invasive rectal surgery after proper formation. These results are especially important in a pandemic context, in which people's mobility is limited.

Conflict of Interests

The authors have no conflict of interests to declare.

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