

Laparoscopic transanal abdominal transanal resection with sphincter preservation for rectal cancer in the distal 3 cm of the rectum after neoadjuvant therapy

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Abstract

Background This study reports the short- and long-term results for a prospective rectal cancer management program using laparoscopic radical transanal abdominal transanal proctosigmoidectomy with coloanal anastomosis (TATA) after neoadjuvant therapy.

Methods A prospective database included 102 rectal cancer patients treated with laparoscopic TATA from 1998 to 2008. Patients with distant metastasis at presentation, patients with a tumor more than 3 cm from the anorectal ring, and patients not undergoing neoadjuvant therapy were excluded, leaving 79 patients (54 men and 25 women) with a mean age of 59.2 years (range, 22–85 years) for this study. 13 patients completed neoadjuvant therapy before the original evaluation, and they are excluded from the report of initial clinical assessment. Before treatment, 50 patients were staged as T3 and 16 patients as T2. The mean level in the rectum superior to the anorectal ring was 1.2 cm (range, –0.5 to 3 cm). In terms of fixity, 31 of the tumors were mobile, 27 were tethered, and 8 showed early fixation. Ulceration was absent in 8 cases, minimal in 12 cases, superficial in 7 cases, moderate in 22 cases, and deep in 17 cases. The mean pretreatment tumor size tumor was 4.8 cm (range, 1.5–12 cm). The median external beam radiation was 5,400 cGy (range, 3,000–8,040 cGy), and 77 patients underwent chemotherapy.

Results The mean follow-up period was 34.2 months (range, 1.9–113.9 months). There were no perioperative

mortalities. The conversion rate was 2.5%, and the mean largest incision length was 4.3 cm (range, 1.2–21 cm). For 84% of the patients, the incision was less than 6.0 cm, and 46% of the patients had no abdominal incision for delivery of the specimen. The mean estimated blood loss was 367 ml (range, 75–2,200 ml). All the patients had a temporary diverting stoma. The major morbidity rate was 11%, and the minor morbidity rate was 19%. The major complications included four full-thickness rectal prolapses with repair, one ischemic neorectum with successful reanastomosis, two bowel obstructions, and two failed anastomoses requiring stoma. The ypT stages included 22 complete responses, 12 cases of ypT1, 22 cases of ypT2, 23 cases of ypT3; 65 cases of ypN0, and 14 cases of ypN+ (T3 = 7, T2 = 4, T1 = 3). The local recurrence rate was 2.5% (2/79), and the distant metastases rate was 10.1% (8/79). The KM5YAS rate was 97%. Overall, 90% of the patients lived without a stoma. Neorectal loss was due to positive margins or recurrence and was followed by abdominoperineal resection in three cases and ischemia in two cases. The condition of two patients was not reversed due to comorbidities, and one patient had a stoma secondary to bowel obstruction.

Conclusion The study results indicate excellent local recurrence (2.7%) and 5-year survival rates without the need for permanent colostomy in patients with cancers in the distal one-third of the rectum. Laparoscopic total mesorectal excision (TME) with the TATA approach is safe and can be performed laparoscopically. Multi-institutional studies are required to establish the reproducibility of this promising approach.

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The principal goals of rectal cancer management are oncologic cure and maintenance of quality of life. Cancer in the distal third of the rectum poses a significant challenge for the surgeon with regard to both goals. The abdominoperineal resection (APR), introduced by Dr. Earnest Miles in 1908, has been considered the gold standard for the treatment of adenocarcinoma in the middle and lower third of the rectum [1]. However, increased understanding of the disease, improved surgical technique, better instrumentation, and the use of preoperative chemoradiation therapy has led to a shift in the treatment of rectal cancer from APR with a permanent colostomy to sphincter-preserving surgery using minimally invasive techniques.

Ultra-low rectal tumors located in close proximity to the anorectal ring and sphincter complex make resection with acceptable distal and circumferential margins difficult, especially in the confines of the bony pelvis. The increased risk of local recurrence and the possible loss of sphincter function have deterred surgeons from attempting sphincter preservation. This has led to the development of a rectal cancer management program, instituted in 1976, designed to reduce local recurrence and extend the use of sphincter-preservation surgery for cancer in the distal third of the rectum by using high-dose preoperative radiation in conjunction with chemotherapy and specifically designed surgical techniques [1, 2].

Neoadjuvant chemoradiation therapy for distal rectal cancer has been shown to improve survival, lower local recurrence rates, and permit broader application of sphincter-preserving surgery by sterilization of the circumferential margins and pelvic sidewall lymphatics [3–9]. Significant tumor downstaging and complete response rates of 18–25% have been noted after preoperative chemoradiation [10, 11].

Previous reports have shown that it is possible to base final decisions regarding sphincter preservation on tumor characteristics after neoadjuvant treatment rather than on tumor characteristics at the time of presentation, thus increasing the number of patients able to undergo sphincter-preserving surgery. Despite this, the APR rates in the literature for cancer of the rectum still are high, with 32–67% of patients requiring a permanent colostomy [12–14]. This situation exists because surgical decision making has routinely been based on tumor characteristics at the time of presentation.

At our institution, Lankenau Hospital and Institute for Medical Research, cancers in the distal 3 cm of the rectum that are mobile 8–12 weeks after neoadjuvant therapy are managed by a laparoscopic transanal abdominal transanal radical proctosigmoidectomy and a descending coloanal handsewn anastomosis (TATA). This technique, developed in 1984 by Dr. Gerald Marks at Thomas Jefferson University Hospital to avoid a permanent colostomy for low-

lying rectal cancer, has become the standard technique used for all mobile cancers in the distal 3 cm of the rectum [1, 2, 15]. In 1998, we began to perform TATA laparoscopically.

In this study, we present the data for 79 patients with cancer in the distal 3 cm of the rectum who were treated with laparoscopic TATA after neoadjuvant chemoradiation therapy.

Methods

Patient selection

The prospective databases of consecutive rectal cancer surgeries since 1976 and laparoscopic surgeries from 1998 to 2008 in a comprehensive rectal cancer program were used for retrospective identification of 102 patients with rectal cancer in the distal 3 cm of the rectum who underwent a laparoscopic TATA after neoadjuvant chemoradiation therapy. For each patient, 167 parameters relative to patient demographics, preoperative diagnosis, intraoperative events, postoperative course, and follow-up assessment were documented on a standardized form. Patients with distant metastasis at presentation, patients with tumors larger than 3 cm from the anorectal ring, and patients who did not undergo neoadjuvant therapy were excluded, leaving 79 patients for this study.

Pretreatment evaluation included clinical examination, blood cell count, serum chemistries, and carcinoembryonic antigen (CEA) levels. All the patients underwent a full colonoscopy preoperatively to rule out synchronous disease.

Local tumor invasion and nodal status were assessed clinically by endorectal ultrasound, pelvic computed tomography (CT), or magnetic resonance imaging (MRI). Overall, 58% of the patients were assessed preoperatively by endorectal ultrasound. Presentation after the start of radiotherapy, circumferential tumors, and unavailability of endorectal ultrasound for patients living at a great distance had a negative impact on our use of this test.

A CT of the chest, abdomen, and pelvis was obtained to evaluate for metastatic disease. Tumor characteristics including tumor level in the rectum, size, fixity, clinical stage, degree of ulceration, position, and configuration were assessed at presentation and again 6–10 weeks after completion of treatment by digital examination and flexible sigmoidoscopy. Before the original evaluation, 13 patients had completed neoadjuvant therapy and were excluded from the initial clinical assessment report.

The 79 patients (54 men and 25 women) ranged in age from 22 to 85 years (mean, 59 years). No patient was excluded on the basis of age. The mean distance of the

Table 1 Patient and tumor characteristics

Mean age: years (range)	59.2 (22–85)
Gender (M/F)	54/25
BMI: kg/m ²	26.5 ± 5.2
Tumor distance from anorectal ring: cm (range)	1.2 (–0.5 to 3.0)
Mean tumor size: cm (range)	4.8 (1.5–12.0)
Pretreatment clinical T-stage (n)	
T3	50
T2	16
Tumor fixity (n)	
Mobile	31
Tethered	27
Early fixation	8
Ulceration (n)	
None	8
Minimal	12
Superficial	7
Moderate	22
Deep	27

BMI body mass index

tumor from the anorectal ring was 1.2 cm. The tumors ranged from 0.5 cm below to 3 cm above the anorectal ring. The mean distance of the tumor from the anal verge was not recorded because the anal canal starts at the anorectal ring, and the length of the anal canal varies from 1 to 5 cm. The pretreatment tumor characteristics and stages are shown in Table 1.

Neoadjuvant and adjuvant chemoradiation

The treatment selection algorithm we used for the patients with rectal cancer is shown in Fig. 1. All the patients in this study received preoperative external beam radiation therapy delivered with a high-energy photon beam from a linear accelerator using a three- or four-field technique. The median radiation dose was 5,400 cGy (range, 3,000–8,040 cGy). The dose was 3,000 to 5,000 cGy for 13

- Unfavorable -All Levels and Favorable ≤6cm-0.5 cm

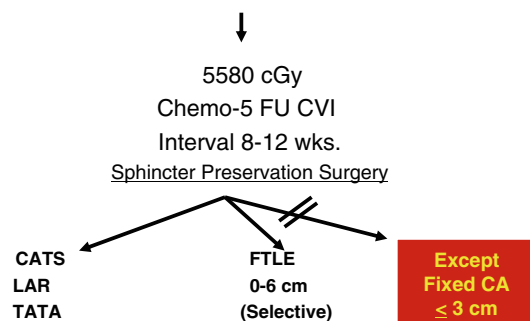


Fig. 1 Treatment algorithm for rectal cancer

patients (16%), 5,001 to 5,400 cGy for 34 patients (43%), and 5,401 to 5,580 cGy for 26 patients (33%). Seven patients (8.9%) received more than the preferred dose of 5,580 cGy, up to 8,040 cGy because of tumor fixity.

Of the 79 patients, 77 (97%) also received concomitant 5-fluorouracil (5FU)-based preoperative chemotherapy (6 boluses, 50 continuous venous infusions, 15 Xeloda doses, 6 unknown agents). Our preferred treatment regimen was a dose of 5,580 cGy and concurrent 5FU-based chemotherapy. However, we were not able to standardize neoadjuvant treatment because 53 patients were treated at outside centers, and 13 patients presented to us after they already had completed their neoadjuvant therapy.

Of the 79 patients, 42 (53%) received postoperative chemotherapy. The majority (69%) received postoperative 5FU and leucovorin; 5FU or capecitabine alone; or 5FU, leucovorin, and oxaloplatin.

The patients were followed up clinically with serial exams every 3 weeks from the initiation of treatment to the time of surgery. Flexible sigmoidoscopy was performed as part of the clinical exam at the initial presentation and at the final preoperative visit to assist with formulating decisions regarding the surgical approach and the need for additional radiation therapy.

The clinical response to neoadjuvant therapy was based on the surface area of the abnormality (tumor size) and intramural involvement (induration). This response was defined as complete (no residual tumor, no surface abnormality, no induration), good (75% or greater reduction in surface abnormality and induration), moderate (25–75% reduction in surface abnormality and induration), minimal (less than 25% reduction in surface abnormality and induration), or no change.

Surgical technique

In our practice, we optimally wait 8–12 weeks from the completion of neoadjuvant treatment until surgery to allow for the maximal downstaging effect of chemoradiation. The decision to perform sphincter-preservation surgery is based on a variety of clinical factors including proximity of the tumor to the anal sphincter complex, response to neoadjuvant therapy, preoperative sphincter function, and prohibitive comorbidities.

All the patients underwent laparoscopic TATA with total mesorectal excision. The operation was initiated by a full-thickness circumferential incision at the dentate line to ensure a known distal margin to the cancer. A plane then was developed intersphincterically (Fig. 2), and the rectum was mobilized transanally to the level of the cervix in the female and to the seminal vesicles in the male. This allowed confidence in obtaining a distal margin and sparing of the external sphincter muscle. Intraoperative frozen

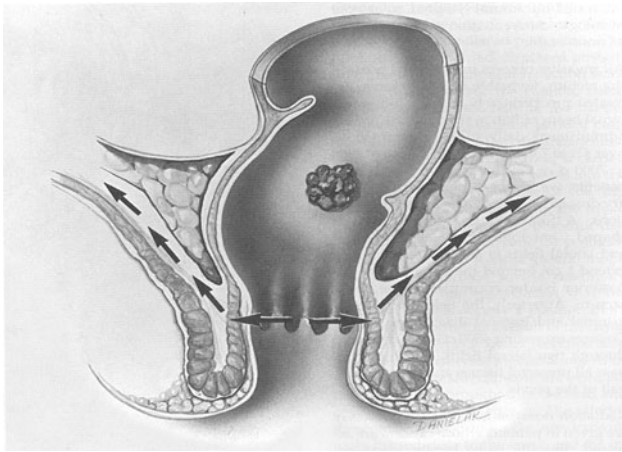


Fig. 2 Intersphincteric dissection plan for transabdominal transanal proctocolectomy

section analysis of margins can be performed selectively when margins were questionable, but was not used in any of these patients.

Laparoscopically, the rectal dissection then was performed transabdominally using a five-port technique (Fig. 3). Full mobilization of the left colon by taking down the splenic flexure was key to ensuring the proper length for creating the anastomosis. The specimen was transected and extracted either transabdominally or transanally. All the patients received temporary fecal diversion with a loop colostomy or ileostomy. The decision between colostomy and ileostomy varied depending on patient body habitus, bowel characteristics, and bowel mobility. A transanal handsewn coloanal anastomosis then was performed. Open cases were managed in a similar fashion.

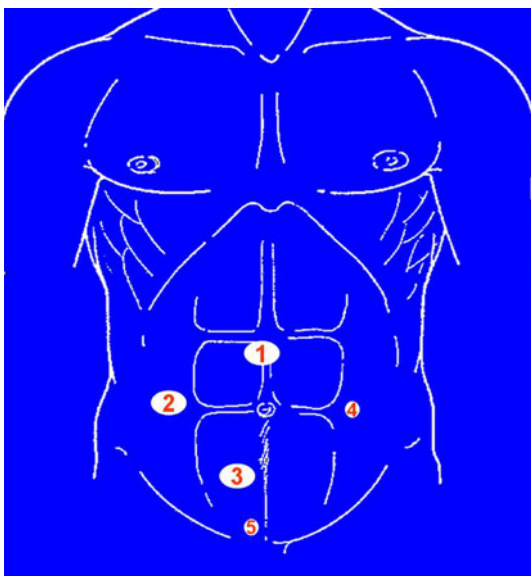


Fig. 3 Placement of five ports

Postoperatively, intravenous antibiotics were continued for at least 24 h and oral antibiotics for at least 10 days. It is our belief that the radiated field is more susceptible to anaerobic infection. A clear liquid diet was begun on postoperative day 1, then advanced as tolerated.

Follow-up visits and assessment for recurrence

The patients were seen within 2 weeks after resection, then every 3 months for the first 2 years, every 4 months for the next 2 years, every 6 months for the next year, and once annually after year 5. Clinical and digital examination generally was performed at each follow-up visit. Flexible sigmoidoscopy was performed at 6-month intervals during the first 24 months. A full colonoscopy was performed 1 year after surgery, then once every 3 years. The CEA level was measured at each visit, and CT scans were obtained based on individual follow-up regimens, generally every 6–12 months. Positron emission tomography (PET) scans were used selectively when abnormalities seen on axial imaging raised the question of recurrence.

Local recurrence was defined as the first clinical, radiologic, or pathologic evidence showing tumor of the same histologic type within the pelvis. Distant recurrence was defined as clinical, radiologic, or pathologic evidence of systemic disease outside the pelvis at sites including but not limited to the liver and lungs.

Results

Neoadjuvant treatment

No significant perioperative radiation-related morbidity occurred. The response to therapy was assessed clinically for all the patients before surgery. The response to neoadjuvant therapy was good to complete for 50 (63%) of the patients.

Surgery

The median time from completion of treatment to surgery was 9.8 weeks (range, 4.1–23.7 weeks). All the patients underwent a laparoscopic TATA with fecal diversion using 3–6 trocars: 3 trocars in 9 cases (11.4%), 4 trocars in 47 cases (59.5%), 5 trocars in 19 cases (24.1%), and 6 trocars in 2 cases (2.5%). The number of trocars used was not recorded in 2 cases (2.5%). The overall laparoscopic completion rate was 94.9%. Of the 79 patients, 2 (2.5%) had conversion to an open procedure secondary to body habitus after splenic flexure release. The procedure for these two patients was finished as a laparoscopically assisted technique.

In the laparoscopic group, the mean incision length was 3.8 cm (range, 1.2–8 cm). The overall mean incision length, including both the conversions to open and laparoscopically assisted procedures, was 4.8 cm (range, 1.2–21.0 cm). The mean estimated blood loss was 367 ml (range, 75–2,200 ml). Only three patients received transfusion of packed red blood cells during surgery. Of the 79 patients, 66 (84%) had an incision shorter than 6 cm, and 36 (46%) had the specimen delivered transanally, with no abdominal incision for specimen extraction.

Pathology

Overall, 22 of the patients (28%) had a pathologic complete response. The final tumor node metastasis (TNM) stage was ypT1 for 12 patients (15%), ypT2 for 22 patients (28%), ypT3 for 23 patients (29%), ypN0 for 65 patients (82%), and ypN + for 14 patients (18%). The mean distal margin was 1.9 cm (range, 0–7.5 cm). One patient (1.3%) had a positive distal margin and ultimately underwent an APR. Distal margins measuring less than 0.5 cm were considered positive margins. Five of the positive circumferential margins (6.3%) had the tumor present within 0–0.1 cm. This group had no local recurrence. The circumferential margins measuring less than 0.2 cm were considered positive margins. All resections were clinical R0.

Standard technique was used for lymph node harvesting, and a mean of 11.4 lymph nodes (range, 1–93 lymph nodes) were harvested. A study from our institution showed that after neoadjuvant therapy, the mean lymph node harvest is 10.1 (range, 1–38), which coincides with our data [16]. The mean specimen length was 33.7 cm (range, 16–117 cm).

Complications

There were no perioperative mortalities. The postoperative complications are presented in Table 2. These included 15 minor complications (18.9%), all treated conservatively, and nine major complications (11%), treated surgically. Four patients had full-thickness rectal prolapse requiring surgical intervention. An ischemic neorectum developed in one patient 5 months postoperatively, requiring resection of the neorectum, with successful reanastomosis. Two patients had a failed anastomosis because of ischemia and required a permanent stoma. Two patients had bowel obstructions requiring lyses of adhesions. One of these patients eventually required a stoma, and did not want it reversed. Neither sexual function nor bowel function were assessed prospectively in the patient population.

An ongoing study from our institution is assessing function and quality of life among rectal cancer patients after radical sphincter preservation surgery subsequent to

Table 2 Postoperative complications

	<i>n</i>
Surgical complications	
Rectal prolapse	4
Wound infection	3
Anastomotic stenosis	6
Pelvic abscess	2
Small bowel obstruction	2
Stomal prolapse	2
Medical complications	
Urinary retention	3
DVT	2

DVT deep venous thrombosis

neoadjuvant treatment. The preliminary results from 61 TATA patients indicate that the surgical approach provides good quality of life and acceptable function, with the majority of responders preferring not to have a stoma [17].

A fast-track protocol was used. The median hospital stay was 5 days (range, 3–24 days). The hospital course included a clear diet after a median of 1 day (range, 1–21 days), a house diet after a median of 3 days (range, 2–22 days), flatus after a median of 2 days (range, 1–7 days), and bowel movement after a median of 2 days (range, 1–22 days).

Recurrence and survival

The mean follow-up period was 34.2 months (range, 1.9–113.9 months). It exceeded 24 months for 47 patients (59%) and 60 months for 10 patients (12.6%). Of the 79 patients, 2 experienced local recurrence, for an overall recurrence rate of 2.5%. One recurrence occurred at 10 months, with synchronous lung metastases. The other recurrence, at 13 months, initially presented as a distant lung metastases 4 months after surgery. The one patient died 2 months and the other 10 months after their metastases. Overall, the distant metastases rate was 10% (8/79). Lung metastases occurred for four patients, liver metastases for three patients, and metastases to a supraclavicular node for one patient. The time until these metastases was 2–49 months after surgery.

The overall Kaplan–Meier 5-year actuarial survival (KM5YAS) rate was 97% (Fig. 4). No deaths occurred among the 14 patients (18%) who were node positive.

Sphincter preservation

Sphincter preservation was ultimately achieved for 71 of the 79 patients (90%). Two patients had positive margins

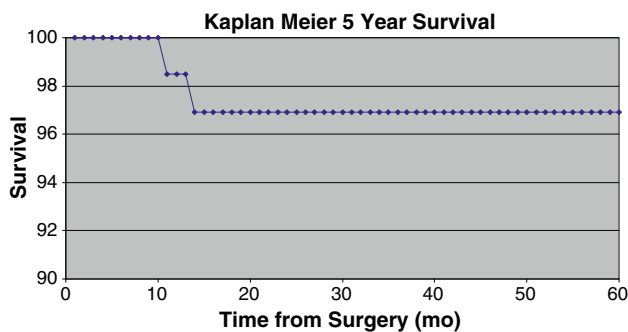


Fig. 4 Kaplan–Meier 5-year actuarial survival

and required an APR with permanent colostomy. One patient had a local recurrence and underwent an APR with a permanent colostomy. Two patients had neorectal loss secondary to ischemia and required a permanent colostomy. Two patients did not have their temporary stoma reversed from their original surgery due to comorbidities. One patient required a stoma after multiple episodes of bowel obstruction.

Discussion

Surgical treatment of locally advanced distal rectal cancer remains as the only method for potential cure. However, the challenge lies in the two often conflicting aims: successful eradication of disease and preservation of normal anal sphincter function. In our series of 79 patients who had T2 and T3 rectal cancers located within 3 cm from the anorectal ring, 90% of the patients lived without a stoma. The overall 5-year survival rate was 97%, and the local recurrence rate was 2.5%. This result was accomplished by the use of preoperative chemoradiation and a minimally invasive technique known as laparoscopic transanal abdominal transanal proctosigmoidectomy with a descending coloanal handsewn anastomosis (TATA).

The decision to proceed with a sphincter-preserving surgery rather than an APR for rectal cancers in the distal 3 cm was based on our experience dating back to 1976 in a rectal cancer management program focused on using high-dose preoperative radiation and chemotherapy to extend sphincter preservation without sacrificing survival [1, 2].

The benefits of combined-method chemoradiation for locally advanced rectal lesions are well established. These benefits include reduced local recurrence and improved survival by downstaging of the primary cancer and sterilization of the peripheral margins and pelvic microlymphatics. Randomized trials also have shown reduced toxicity and increased tumor response when chemoradiation is delivered preoperatively rather than postoperatively [3–9].

In our practice, all rectal cancer patients undergo prospective staging. All unfavorable cancers (evidence of full-thickness penetration or perirectal lymph nodes) and all cancers in the distal 6 cm of the rectum are managed with preoperative chemoradiation. Our preferred treatment regimen is to a dose of 5,580 cGy and concurrent 5FU-based chemotherapy.

In the current study, all the patients received external beam radiation therapy, with 97% also receiving concomitant 5FU-based chemotherapy. The median radiation dose was 5,400 cGy (range, 3,000–8,040 cGy), with 84% receiving more than 5,000 cGy. Seven patients (8.9%) received up to 8,040 cGy. These patients had T3 tumors with inadequate initial response to treatment. Without the additional radiation, they would have required an APR because of tumor fixity, location (–0.5 to 1.5 cm from the anorectal ring), or size (4–7 cm). With the increased dose, all had downstaging sufficient to undergo a laparoscopic TATA. In our series, 28% of the patients had a pathologic complete response after preoperative chemoradiation.

Laparoscopic sphincter preservation surgery was performed 8–12 weeks after radiation therapy for all cancers except those that remained fixed at or below the 3-cm level. These fixed, very-low-lying cancers were treated by APR. At our institution, laparoscopic TATA is the standard treatment for all mobile cancers in the distal 3 cm of the rectum. In this study group, the TATA procedure was completed laparoscopically 97.5% of the time. Two patients underwent conversion to an open procedure.

The mean largest incision length was 4.3 cm, with 84% of the incisions smaller than 6 cm. For 46% of the patients, the specimen was removed transanally, and no abdominal incision was made besides those for the trocar sites.

The procedure begins with a full-thickness incision through the anal canal just above the dentate line. An intersphincteric dissection between the puborectalis and the internal sphincter muscle is performed. The upper third of the internal sphincter is resected en bloc with the rectum, preserving the external sphincter, puborectalis, and levator ani muscles. This intersphincteric resection in addition to neoadjuvant chemoradiation enhances sphincter preservation by extending the distal margin, thereby enabling clearance even of tumors abutting the anorectal ring.

Traditionally, a 2-cm margin was thought necessary for oncologic clearance in nonirradiated patients secondary to distal intramural tumor extension [18–20]. However, recent literature shows that after neoadjuvant combined-method therapy, intramural tumor extension beyond the gross mucosal edge generally is less than 1 cm [21, 22]. Reappraisal of the distal margin to 1 cm allows for increased sphincter preservation. In our series, only one patient (1.3%) had a positive distal margin.

Obtaining negative circumferential resection margins (CRM) also is important if not more critical than achieving negative distal margins [23, 24]. Negative radial margins are more difficult to accomplish because the mesorectum is thin or absent at low levels of the rectum. In this study, 93.7% of the patients had a negative CRM. Our results compare favorably with the literature. For instance, Rullier et al. reported a positive CRM for 11% of their cases [25]. It must be remembered that 60% of the patients in our study group had ypT2 or ypT3 cancers.

Another benefit of the described surgical approach is derived from beginning the dissection transanally, which ensures a maximal and known distal margin to the cancer, avoiding the pitfall of inability to palpate a previously radiated small, very-low-lying rectal cancer [1, 2]. Performing the TATA procedure laparoscopically also gives all the well-established benefits of minimally invasive surgery including reduced trauma and postoperative pain, a shorter hospital stay, faster recovery of bowel function, and more cosmetic incisions [26].

During a mean follow-up period of 34 months, the local recurrence rate for our study population was 2.5%. The two local recurrences occurred respectively at 10 months and 13 months and had synchronous distant metastases to the lungs. The Kaplan–Meier 5-year actuarial survival rate was 97%.

These results compare favorably to those in the literature. Portier et al. reported a 10.6% local recurrence rate and an 86.1% 5-year survival rate in their series of 173 patients, 88% of whom received preoperative radiotherapy [27]. Multiple studies investigating sphincter preservation after preoperative chemoradiation have published local recurrence rates ranging from 4% to 17% [28–35]. It is important, however, to keep in mind that most of these series included T3 lesions located 5 cm or more from the anal verge, whereas, in our series, all tumors are located in the distal 3 cm of the rectum. Our excellent local recurrence and 5-year survival rates support the oncologic rationale for intersphincteric dissection after preoperative chemoradiation for ultra-low rectal cancers.

The postoperative complications in our study group are comparable with those reported in the literature [23, 25]. There were 15 minor complications (18.9%), all treated conservatively, and 9 major complications (11%), treated surgically. Four patients had a full-thickness rectal prolapse requiring a Delorme procedure. Two patients experienced bowel obstructions requiring lyses of adhesions. Three anastomoses failed, requiring their takedown. One of the three anastomoses could be salvaged with recreation of the neorectum, but two ultimately required a permanent stoma. Overall, 90% of the patients lived without a stoma. Although complications tend to occur more frequently after preoperative radiation therapy, our 11% major morbidity

rate supports the fact that laparoscopic TATA can be performed safely after preoperative chemoradiation.

Ongoing studies are needed for prospective assessment of pre- and postsurgical quality of life, sphincter function, and sexual function. These studies will better allow us to understand outcomes for patients with low rectal cancer.

Conclusion

The treatment of rectal cancer has undergone a fundamental shift. Great emphasis is placed not only on oncologic cure but also on maintenance of quality of life with sphincter preservation using minimally invasive techniques. In a comprehensive rectal cancer management program that uses neoadjuvant chemoradiation therapy and specifically designed surgical techniques, our results show excellent local recurrence and 5-year survival rates without the need for a permanent colostomy in patients who have cancers in the distal third of the rectum. Laparoscopic total mesorectal excision with intersphincteric dissection in the transanal abdominal transanal (TATA) approach is safe and can be performed laparoscopically. Multiple institutional studies will be required to establish the reproducibility of this promising approach.

Disclosures John Marks has an equity interest in Covidien, Wolfe, Stryker, Glaxo Smith Kline, Zassi, and Surgiquest and is a consultant to Covidien, Wolfe, Stryker, Glaxo Smith Kline, and Zassi. He is on the Scientific Advisory Board of Surgiquest and serves on the speaker's bureau of Covidien, Wolfe, and Stryker. He has received educational grant support from Covidien and honoraria from Zassi. B. Mizrahi, I. Nweze, G. Marks, and S. Dalane have no conflicts of interest or financial ties to disclose.

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