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Further Proof of the Oncologic Safety of Transanal Total Mesorectal Excision

Steven D. Wexner, MD, PhD(Hon)

In the manuscript titled “Local Recurrence and Disease-Free Survival After Transanal Total Mesorectal Excision: Results From the International TaTME Registry,” elsewhere in this issue, Roodbeen et al¹ presented the largest series of transanal total mesorectal excision (taTME) cases published to date: 2,803 operations with a median follow-up of 24 months. This study was very well conducted and had excellent follow-up, and is critically important because of the constant evolution in the management schema of rectal cancer.

Rectal cancer resection was traditionally associated with unacceptably high rates of local recurrence. Thanks to the pioneering work of Professor Richard J. Heald, the concept of TME was introduced. Surgeons around the world began to embrace the concept of achieving tumor-free circumferential resection margins with complete or near-complete mesorectal specimens. The debate shifted from the advisability, and in fact requirement, of TME when surgery with intent to cure was performed to how to best achieve that result.

A combination of preoperative imaging allowing appropriate assignment of neoadjuvant chemoradiotherapy combined with a variety of surgical approaches became the work of multidisciplinary teams. The importance of the multidisciplinary team in the United States was ultimately codified by the launch in 2018 of the American College of Surgeons Commission on Cancer National Accreditation Program for Rectal Cancer. The surgical aspect of this dialogue has centered around methods of best achieving a circumferential resection margin free of tumor to produce a complete or near-complete TME specimen. Techniques have shifted from open surgery to a variety of minimally invasive platforms.

During the 1990s and early 2000s, a variety of randomized controlled and other studies clearly demonstrated the oncologic acceptability of laparoscopic TME. Subsequent to those studies, other investigations, in turn, demonstrated equivalence between laparoscopic and robotic minimally invasive surgical techniques. The most newly introduced method of attempted surgical cure of rectal cancer is taTME.

The common denominator among all of these types of minimally invasive surgery is to offer patients with rectal cancer the advantages of minimally invasive surgery; specifically, the well-known short-term benefits relative to recovery, which have been proven repeatedly over the last >30 years, along with the longer-term benefits, such as decreased rates of intra-abdominal adhesions and hernias, and, according to some studies, possibly even oncologic benefits. The reluctance of some surgeons to learn and/or implement laparoscopic rectal cancer surgery has been an impetus for the increased performance of robotic rectal cancer surgery. Whether minimally invasive rectal cancer surgery is performed by a robotic or a laparoscopic approach is immaterial, given that the outcomes are virtually identical in almost every published study. The goal is to ‘HELP’ our patients by keeping our Hands Extracorporeal during Laparoscopic and robotic Procedures. TaTME adds another potential method of operative access and rectal extirpation to help us meet this repeatedly proven outcome and afford patients the innumerable benefits of minimally invasive versus open surgery for rectal cancer.

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The concept of taTME was first introduced by Dr. Patricia Sylla and colleagues in the United States in 2010.² The technique was quickly embraced by Dr. Antonio Lacy from Barcelona, Spain, who immediately established training programs, live demonstrations, and very importantly, data collection. In perhaps the first large study of taTME, Lacy et al,³ including me and Professor Heald, presented the results of 140 taTME procedures performed for rectal cancer. In our study, the mean operative time was 166 minutes and there were no conversions or intraoperative complications. The macroscopic quality of the resected specimen was complete or near-complete in 99% of cases. At a mean follow-up of 15 months the local recurrence rate was 2.3%. Based on our initial published series, we were very encouraged and continued to advocate for taTME. Although numerous subsequent studies demonstrated the safety, efficacy, and oncologic acceptability of the technique, one study failed to do so. In a study involving 366 patients, Caycedo-Marulanda et al⁴ evaluated the results of surgeons from 8 centers. The overall prevalence of local recurrence was 4.1% at a median follow-up of 35 months, which upon further evaluation included a 7.5% local recurrence rate during the implementation phase (the first 10 cases) and a 3.1% local recurrence rate in the post-implementation phase (after the tenth case). This 60% decrease was also associated with complete or near-complete TME specimens in 87.7% of the cases, and with circumferential and distal margins being free of tumor in 93.2% and 92.6% of the cases, respectively.

Sadly, these very acceptable outcomes were not universally reproduced, as the Norwegian Colorectal Cancer Group failed to achieve acceptable results.⁵ During the period from January 2015 to December 2017, 110 TME procedures were performed in Norway. The authors noted “at least” 10 local recurrences (9.5%) at a median of 11 months after surgery. They were so concerned about the multifocal nature of these recurrences as well as the early onset of such recurrences that a national moratorium was placed on taTME in Norway. That national moratorium prompted additional investigation. In a study published earlier this year, Roodbeen et al⁶ amassed data on 767 patients who underwent taTME in 6 tertiary referral centers. The rate of margin positivity was 8% at a median of 25.5 months, and the 2-year actuarial cumulative local recurrence rate was only 3%. In fact, 10 of the 13 patients who had isolated local recurrence were successfully managed by salvage surgery such that 8 patients were disease-free at the end of follow-up. Both laparoscopy and robotic abdominal approaches have been successfully employed.

In another large study, Penna et al⁷ utilized data from the taTME registry collaborative. Among their 720 patients prospectively entered into the registry, 634 underwent surgery for rectal cancer. Complete or near-complete TME specimens were produced in 96% of patients—very similar to the rate previously noted by Lacy et al.³ Based on that result, as well as the acceptable specimen quality, number of lymph nodes harvested, and distal and radial margins being free of tumors, the expectation would be for a low local

recurrence rate. One of several major differences between the Norwegian study and other studies from the United States and the European Union relates to a learning curve (implementation phase) and the number of cases performed per surgeon. Whereas during a 36-month period 110 taTME operations were performed throughout the entire country of Norway (an average of 3 cases per month), high-volume centers such as Hospital Clinic of Barcelona, Cleveland Clinic Florida, and other institutions may well perform that number of cases in an individual center in 1 week or 1 month. This subject is broached by van Oostendorp et al,⁸ who found that during the implementation phase of 120 patients, at a median follow-up of 21.9 months the anastomotic leakage rate was 17% and local recurrence rate was 10%. Moreover, in 8 of the 10 patients with local recurrence, that local recurrence was multifocal.

Thus there appears to be a major dichotomy in the reporting of the results based on taTME. In my opinion, the important lesson to be learned is that one should not embark upon taTME unless it can be undertaken in a high-volume setting where expertise can be developed quickly to rapidly surpass the implementation phase. The important concepts of structured training including proctoring have been emphasized. In numerous prior editorials and invited commentaries, I have emphasized the need for appropriate structured training and the ability to perform a sufficient volume of cases to develop and maintain expertise.^{9,10} Even in the absence of an adequate number of surgeons to implement the typical 2-team taTME operation, a 1-team surgical approach has been proven safe and effective.¹¹ However, the same caveats about training and volume apply in these settings.

Within the context of high-volume settings, it would appear that taTME is not only safe but also potentially preferable to non-taTME performance of TME. The article by Roodbeen et al¹ in this issue clearly supports this view. The authors quite diligently enrolled >2,800 patients in whom taTME was performed. After a mean follow-up of 24 months, the 2-year local recurrence rate was 4.8% and was in fact unifocal rather than multifocal in 99 of those 103 patients. Not surprisingly, independent risk factors for local recurrence included male sex, threatened resection margin on baseline MRI, pathologic stage III cancer, and a positive circumferential resection margin.

I applaud the authors on having reconfirmed the safety and oncologic acceptability of taTME when performed by appropriately trained surgeons in adequate numbers to achieve such results. Their study is yet additional proof of the technical and oncologic acceptability of taTME. It is also further evidence of the predictably ill-fated outcomes, such as occurred in Norway, when adherence to these essential training and volume guidelines is not followed.

Disclosures: Dr. Wexner has disclosed serving as a consultant for Stryker, Intuitive Surgical, and Medtronic, and receiving royalties and owning stock/having ownership interests in Intuitive Surgical.

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