



EDITORIAL

The impact of transanal total mesorectal excision on functional outcomes: A future standard?

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Introduction

Rectal cancer is one of the most commonly diagnosed malignancies and the burden of the disease is expected to increase by more than half in 2030.¹ Total mesorectal excision (TME) was originally performed as an open procedure; however, over time the laparoscopic approach to the TME (LaTME) has become more prevalent, and in some cases, preferred.² This approach has been demonstrated to have better short-term results and similar long-term outcomes to the open approach.³ However, the laparoscopic approach remains limited in its value due to several key challenges.² The LaTME is particularly challenging in patients with a narrow pelvis, which is commonly observed in those with high body mass index, low rectal cancer or bulky cancer, or in males.^{3,4} In these cases, there is a high probability of leaving behind a positive circumferential resection margin and/or conversion to open, particularly for relatively inexperienced surgeons.^{2,5}

A new approach—transanal total mesorectal excision (TaTME)—was developed in 2010 to address some of these limitations.⁶ The TaTME was designed to improve outcomes in TME individuals with mid-low rectal cancer, or those with unfavorable patient characteristics, such as a narrow pelvis. For instance, in the TaTME, the obstacle of a narrow pelvis was overcome by approaching the dissection from the distal end or the “bottom up”.⁵ This enables a more accurate assessment of the resection plane through

better visualization and an opportunity to protect the distal margin with a purse-string suture, as opposed to cross stapling and “dog ears” associated with the laparoscopic approach.

This new approach (TaTME) reduces the risk of anastomotic leakage, decreases mini laparotomy and wound complications, increases the rate of sphincter preservation, and may possibly improve nerve preservation, which leads to less morbidity and improved long-term urinary and sexual function.^{5,7-9} Despite all these advantages, one of the greatest concerns in the transanal approach is its impact on long-term functional outcomes, which has only been briefly examined.¹⁰ This impact could be affected by several factors, such as the close proximity of the anastomosis to the anal sphincter compared to a laparoscopic approach, the prolonged dilatation of the sphincter, and the radical resection in the lower pelvis. These factors can lead to a loss of innervation and functional integrity.⁹ The majority of studies conducted on the TaTME, focus exclusively on oncological outcomes by briefly mentioning or forgetting, altogether, the impact of the procedure on the functional outcomes. Although the available data on the functional outcomes following TaTME is scarce, it will be reviewed in more detail in the following section.

Functional Outcomes

The main functional and morbidity outcomes pertaining to surgical resection of rectal cancer, include anorectal function, urinary function, sexual

function, and quality of life. However, these are least studied as they are the qualitative outcomes that are largely patient reported and difficult to measure. These outcomes will be considered individually.

Anorectal function

The most studied functional outcome is understandably the anorectal function. The prolonged anal stretch during the TaTME, in combination with the low coloanal anastomosis and the involvement of the internal anal sphincter may result in impaired anorectal function. A measure of this is the occurrence of low anterior resection syndrome (LARS), which is a clinical diagnosis in patients with symptoms such as frequency/urgency of stools, stool or gas incontinence, clustering of stools, and irregularity in the bowel habits following a surgical resection involving part of the rectum.¹¹ Studies have observed that one month post TaTME, the incidence of LARS increases significantly, however, after six months it decreases to 33%. Although this figure remains slightly higher than the preoperative incidence,⁹ this number is comparable to LaTME approach, where one third of the patients are reported to develop LARS after surgery.¹² According to other studies, the post TaTME rate of fecal incontinence is between 5.7% and 60%, with approximately 40% of the patients being fully continent.^{2,4} Many of these patients who experienced fecal incontinence, often underwent difficult dissections requiring coloanal anastomosis. Apart from fecal incontinence, patients can also experience difficulty evacuating stools and stool fragmentation, or they may require a permanent colostomy in a small percentage of cases.⁴

Urinary function

A total mesorectal excision may impair urinary function due to injury of the pelvic nerves during mobilization of the rectum.⁵ Ma et al. posit that the transanal approach to the TME allows superior visualization and more meticulous dissection permitting nerve preservation resulting in less urinary complications.³ Certain studies have reported similar rates of urinary complications when comparing LaTME to the TaTME (16.7% vs 20%).^{2,13} However, other studies have determined a slight decrease in rates with the TaTME.³

Another study demonstrated postoperative functional urinary outcomes to be similar, within a narrow margin, to preoperative function.⁹ Although, only a handful of studies have measured urinary outcomes following a TaTME, they mostly indicate comparable outcomes to the other TME approaches—laparoscopic and open.

Quality of life

Of the functional outcomes, this is the most subjective and least studied. Quality of life is commonly assessed using the EQ-5D index, which is a measure of overall health status that examines the impact of the illness or condition in five key domains: mobility, self-care, daily activities, pain, and anxiety/depression. A score of 100 translates to full health and no morbidity.¹⁴ Studies have found that TaTME patients return to their preoperative EQ-5D index (~85–90) six months postoperatively. Two months postoperatively, a reduction in quality of life (score=78) was documented due to pain and impaired social life; however, it was resolved within six months on an average.⁹ These findings suggest that the TaTME does not impair long-term quality of life; however a short-term postoperative impairment is anticipated. These findings are also comparable to reported outcomes following a LaTME.

Sexual function

Sexual dysfunction is the last outcome measured, although it is multifactorial in nature and difficult to attribute, its causation is directly related to the TaTME procedure. Nonetheless, several studies have examined sexual function in the context of TaTME. The cause of the dysfunction is not clearly understood; however, the contributing factors may include psychological effect, related to pain and other morbidity, and a result of autonomic nerve injury to the sacral splanchnic and hypogastric nerves.¹⁵ Koedam et al. reported that one month postoperatively, male interest in sexual intercourse decreased and returned to the preoperative baseline six months after operation.⁹ Erectile problems did not increase significantly. Another French study observed that, after TaTME, 66.6% of the male patients had unaffected ejaculation and 11.2% had failed ejaculation.¹⁶ Impotence was seen in 11.2% of the male patients postoperatively. Unfortunately,

there is little data on female sexual function across most studies.

In summary, most postoperative functional outcomes return to their preoperative baseline level six months postoperatively, with the exception of anorectal function, which may leave some long-term impairment in selected cases. All postoperative outcomes following a TaTME were comparable to those following a LaTME.

Conclusion

Buchs et al. capably summarize the future of TaTME in 7 questions: (1) How to overcome the technical limitations? (2) Who are the best candidates? (3) What are the long-term outcomes? (4) How to teach this technique? (5) What are the prerequisite skills for the surgeon and the learning curve? (6) What are the associated costs? and (7) Should everyone be doing it (i.e. is there a minimum case volume)?⁴

The latest evidence on the TaTME approach is very encouraging. Many studies have been demonstrating good long-term oncological outcomes.^{8,17} However, all patients are not ideal candidates for this procedure and all centers do not possess the expertise and resources to perform it. Although, the evidence is promising, there remains a need for more high quality randomized data and an international collaborative effort to pool resources and patient data in order to draw reliable conclusions. One ongoing trial currently in Phase III may answer some of these questions. The COLOR III trial is a large randomized, multicenter clinical trial with participating centers from the Netherlands, Spain, and the United Kingdom. This trial is expected to be completed by 2020 and will address both short and long-term outcomes of the LaTME and TaTME. It is a highly anticipated milestone study in the surgical management of rectal cancer.^{18,19}

Another angle to consider is the cost effectiveness of this procedure which needs to be studied in detail. A cost effectiveness study has not been performed comparing TaTME to LaTME, however it may be that the direct costs of the TaTME are higher but that the improved long-term outcomes may result in enough downstream cost savings to offset the initial investment. The excellent oncological outcomes associated with the TaTME do not come at the expense of functional outcomes as presented

in the above data. More focus on postoperative pain management and pelvic floor strengthening would greatly improve patient functional outcome following a TaTME and should be considered as part of a protocol.

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