CHAPTER


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INTRODUCTION

Transanal total mesorectal excision (taTME) for rectal cancer is a new endoscopic approach in which the rectum is mobilised from the anus up to the rectum itself with a flexible multiple access port. A potential advantage of this technique is a decrease in conversions from laparoscopic to open procedures and therefore less complications and an increase in the amount of radical resections. Furthermore, the costs of this technique are relatively low because of the use of regular laparoscopic instrumentation. The learning curve is expected to be similar to other laparoscopic procedures and expected to be even shorter in more experienced laparoscopic surgeons. Additional research is necessary to compare the oncological and clinical long-term outcomes of transanal TME with traditional laparoscopic and open TME.

WHICH TECHNIQUE?

Transanal local excision of rectum tumours is applied for several years and is considered to be the precursor to a new endoscopic technique for rectal cancer the transanal total mesorectal excision (taTME). With this technique, the affected part of the rectum and its mesorectum are dissected from the anus to proximal through a flexible multiple access transanal port.

Prior to the surgical procedure, the patient is placed in lithotomy position (figure 1) and the rectum is rinsed with a povidone-iodine solution. The first step of the procedure is similar to the traditional laparoscopic approach and comprises laparoscopic mobilisation of the left hemicolon. Hereafter, the transanal port is introduced without the need of anal sphincter dilatation and the rectum is insufflated. A regular 5 mm, 30-degree endoscope is used in combination with other standard endoscopic instruments. Figure 2 displays the different procedural steps.

During proctoscopy, the distal resection margin with a minimum of 2 cm from the tumour can be determined. To prevent bacterial and tumour spillage, the rectum is endoscopically closed with a purse-string suture. A pneumorectum is created with carbon dioxide at a pressure of 14 mmHg. Hereafter, a full-thickness transection of the mucosa can be performed. The avascular presacral plane is developed by gently pushing against the tissue, starting at the dorsal site of the rectum (figure 2c). According to TME principles, the plane of dissection was first extended posteriorly, then anteriorly, and finally laterally. After circumferential mobilisation of the rectum, the peritoneal reflection is...
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identified and opened, thereby entering the peritoneal cavity. Hereafter, the rectum can be removed through the anus (figure 2d). To avoid rotation of the colon, the rectosigmoid is exteriorised transanally under direct endoscopical visualisation through the abdominal port. The proximal resection margin can now be determined (figure 2e) and the affected part of the rectum can be resected. An anastomosis is created with an EEA-haemorrhoid stapler (Covidien, Mansfield, MA, VS) between the sigmoid colon (proximal resection margin) and the remaining rectum (distal resection margin). This specific circular stapler has a long shaft when compared to other types of staplers, which is necessary to bridge the distance between the distal sigmoid and the anus. The distal part of the sigmoid is sutured around the stapler’s anvil. The anvil with the sigmoid is then replaced transanally to the right level for the creation of the anastomosis. At this point, the long stapler’s shaft protrudes outside the anus (figure 2f). Another purse-string is placed to suture the remaining rectum around the anvil. Subsequently, an end-to-end anastomosis can be created between the sigmoid and the rectum. Finally, a temporary ileostomy is created.

Figure 1. Surgical setup.
Figure 2. Steps of taTME: distal resection margin (a), closure with a purse-string suture and transection of the mucosa (b), mobilisation according to TME criteria (c), transanal specimen removal (d-e), suturing of stapler head (f), second purse-string and stapled anastomosis (g).

WHY THERE SHOULD BE A NEW TECHNIQUE

Currently, the standard surgical treatment for rectal cancer is a transabdominal laparoscopic TME. In this procedure, the rectum is approached laparoscopically through the abdomen in which the rectum is mobilised from proximal to distal. In approximately 17 percent of the patients, this technique is not feasible; in these cases a conversion from laparoscopic to open TME is necessary.\(^2\) Reasons for conversion to open surgery include large tumours and the male pelvis, where there is limited space to mobilise the distal part of the rectum. The percentage of conversion did not decrease over the past few years. Several studies show more complications in converted procedures.
Furthermore, in case of distal rectal tumours, it is challenging to obtain an adequate resection margin with laparoscopic TME. It is often considered difficult to position the stapler at the exact resection margin. A limited working space in the pelvis and difficulty positioning the stapler, potentially results in insufficient oncological resection margins, damage of the tumour and spread of tumour cells.

In order to reduce the conversion rate to open TME, a new surgical approach is desirable.

WHAT ARE THE INDICATIONS?

All patients with rectal cancer and an indication for laparoscopic TME are eligible for taTME. An advantage of taTME is the avoidance of abdominal incisions to remove the tumour. Whether this improves patient recovery is still yet to prove. A relative disadvantage is a longer operative time. Especially in difficult cases, for example the male patient with a narrow pelvis, patients with large tumours, or obese patients, the transanal approach can be the first choice of surgery to prevent conversion and to obtain good oncological results.

WHAT ARE THE BENEFITS?

One of the potential advantages of taTME is the reduction in conversion rate.\textsuperscript{1} Thus, a greater number of patients can benefit from the advantages of laparoscopic surgery: less pain due to smaller wounds, a shorter hospital stay, a more rapid rehabilitation, and improved cosmetic results.

Furthermore, the surgeon has an improved view on the anterior surface along the prostate and vesicles while mobilising the rectum. This can be an advantage compared to the traditional laparoscopic approach in terms of urosexual function. As a result of the improved visibility, the percentage of non-radical resections may also decrease.
WHAT IS KNOWN ABOUT ITS EFFECTIVITY?

Transanal TME was first described in 2009 by Zorron et al.¹ The authors described 2 different techniques in 2 patients. In the first patient, a flexible endoscopy was used. In the second patient, the surgeons performed a single-incision laparoscopy with standard laparoscopic instruments. Since then, several other case reports have been published regarding transanal TME. Recently, our study group published the short-term outcomes of the first 5 patients who had been treated with this new technique in The Netherlands. This concerned a non-selected group of patients.³ Currently, already more than 30 patients have undergone taTME in our institution. Whether the oncological, postoperative and functional results are similar to the traditional laparoscopic approach has yet to be proven.

HOW DIFFICULT IS IT TO LEARN THE TECHNIQUE?

For experienced laparoscopic or transanal endoscopic microsurgery (TEM) surgeons, there is an estimated learning curve of 10 procedures to safely operate through a flexible anal multiple access port.⁴ Overall, transanal TME is quite similar to the standard laparoscopic TME, with the most important difference that the rectum is mobilised from distal to proximal instead of the other way around.

FUTURE PERSPECTIVES

Given the initial positive results, the demand for this technique is thought to increase. Furthermore, this technique, unlike other new techniques, does not bring high costs, because of the use of standard laparoscopic endoscopes and instruments. An important question is whether the (oncological) long-term results are similar or even superior to the traditional laparoscopic procedure.
WHERE IN THE NETHERLANDS?

This procedure is partially developed in the Gelderse Vallei hospital in Ede. Further development and implementation will take place in collaboration with the Vrije Universiteit Medical Centre in Amsterdam. Workshops have already been started and ‘hands-on-training’ is in preparation.
A NEW TREATMENT FOR RECTAL CANCER, TRANSANAL TME
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REFERENCES