Transanal single-port surgery for local excision of rectal tumours

M.W.J. Stommel
S. Velthuis
P.B. van den Boezem
C. Sietses

Ned Tijdschr Geneeskd. (2012);156(33):A4889

Originally published in Dutch as 'Flexibele toegangspoort voor excisie rectumtumoren'.
INTRODUCTION

Transanal endoscopic microsurgery (TEM) is widely used as an organ-sparing technique in the treatment of rectum tumours. However, the instrumentation is relatively expensive and the technique is considered as complex. Since 2010, several case reports have been published regarding the transanal excision of rectum tumours with an anal access port. This comprises a flexible multiple access port, which was initially designed for transumbilical laparoscopic surgery. The shape and material make the port also highly suitable for transanal applications. Transanal surgery with a flexible anal access port is a relatively simple procedure without the need of investment in new surgical instrumentation. This new technique will make transanal endoscopic surgery accessible to a wider group of surgeons.

WHICH TECHNIQUE?

Local excision of rectum tumours is already an organ-sparing alternative to rectum resections in the treatment of rectum tumours. Transanal endoscopic microsurgery was introduced in the eighties of the last century. At the time, most surgeons used a 40 mm-proctoscope to perform full thickness excisions up to 20 cm from the dentate line. Transanal endoscopic microscopy can be considered to be a safe procedure with less morbidity compared to rectum resections. Since 2010, various case reports and series have been published in which a new technique is described for the local excision of rectum tumours. In this technique, a flexible multiple access port ('single-access port') is used instead of the more traditional proctoscope. To date, evidence for this technique is limited, but studies have already demonstrated the feasibility of transanal excision of rectum tumours through a flexible multiple access port without the development of major complications.

Preoperatively, the patient will have bowel preparation and will receive prophylactic intravenous antibiotics before induction of general anaesthesia. Dependent on the location of the tumour, the patient is positioned in lithotomy position or in prone position. The access port will be positioned in the anal canal without the need for dilatation of the anal sphincter. A pneumorectum will be created with CO$_2$-insufflation to a pressure of 20 mmHg and three trocars will be placed in the access port. In this manner, the surgeon can perform a full thickness excision of the rectum tumour with regular laparoscopic instruments. At last, the defect will be closed with a suture.
INTRODUCTION

Transanal endoscopic microsurgery (TEM) is widely used as an organ-sparing technique in the treatment of rectum tumours. However, the instrumentation is relatively expensive and the technique is considered as complex. Since 2010, several case reports have been published regarding the transanal excision of rectum tumours with an anal access port. This comprises a flexible multiple access port, which was initially designed for transumbilical laparoscopic surgery. The shape and material make the port also highly suitable for transanal applications. Transanal surgery with a flexible anal access port is a relatively simple procedure without the need of investment in new surgical instrumentation. This new technique will make transanal endoscopic surgery accessible to a wider group of surgeons.

WHICH TECHNIQUE?

Local excision of rectum tumours is already an organ-sparing alternative to rectum resections in the treatment of rectum tumours. Transanal endoscopic microsurgery was introduced in the eighties of the last century. At the time, most surgeons used a 40 mm-proctoscope to perform full thickness excisions up to 20 cm from the dentate line. Transanal endoscopic microscopy can be considered to be a safe procedure with less morbidity compared to rectum resections. Since 2010, various case reports and series have been published in which a new technique is described for the local excision of rectum tumours. In this technique, a flexible multiple access port (‘single-access port’) is used instead of the more traditional proctoscope. To date, evidence for this technique is limited, but studies have already demonstrated the feasibility of transanal excision of rectum tumours through a flexible multiple access port without the development of major complications.¹

Preoperatively, the patient will have bowel preparation and will receive prophylactic intravenous antibiotics before induction of general anaesthesia. Dependent on the location of the tumour, the patient is positioned in lithotomy position or in prone position. The access port will be positioned in the anal canal without the need for dilatation of the anal sphincter. A pneumorectum will be created with CO₂-insufflation to a pressure of 20 mmHg and three trocars will be placed in the access port. In this manner, the surgeon can perform a full thickness excision of the rectum tumour with regular laparoscopic instruments. At last, the defect will be closed with a suture.
WHY THERE SHOULD BE A NEW TECHNIQUE

Transanal endoscopic microsurgery is traditionally carried out with specialised TEM instruments. This results in high costs, but furthermore results in the need for education. The transanal use of the flexible multiple access port makes it possible to use regular laparoscopic instruments. This has two major advantages: this technique is cheaper than TEM and gives a laparoscopic surgeon a relatively short learning curve. Furthermore, the laparoscope magnifies the image, resulting in a more precise dissection.

Temporary or permanent incontinence, due to a rupture of the internal anal sphincter, is a potential complication after TEM. Prospective studies have shown functional impairment of the internal anal sphincter in the first postoperative phase; 2-4 percent of the patients experienced temporary faecal incontinence. Excision with the flexible anal access port with a diameter less than 3 cm potentially leads to less damage of the anal sphincters than excision through the regular rigid proctoscope with a diameter of 4 cm.

WHICH ARE THE INDICATIONS?

The indication for local rectal tumour excision with the flexible port is similar to that for traditional transanal endoscopic microsurgery. This comprises benign rectum tumours, diagnosed with endorectal ultrasound and histologically proven with biopsy. Whether local excision of a T1-rectum carcinoma is an adequate alternative to resection is still an important point of discussion. In theory, local excision could be sufficient in the treatment of well to moderately differentiated T1-rectum carcinomas without signs of vasoinvasive/lymphangio-invasive growth in case of radical excisions margins.\(^3\)

To be able to reach the tumour, the distance to the anal verge should not exceed 20cm, similar to the maximum distance with TEM. Partly depending on the patient’s anatomy, higher located tumours can be reached. In distally located rectum tumours, sufficient space is needed to place the scope distal to the tumour in the anal canal without the occurrence of gas leakage.\(^3\) If the
tumour is situated close to the dentate line, an open transanal excision should be taken into consideration.

WHAT ARE THE BENEFITS?

Transanal endoscopic microsurgery is still only carried out in a few hospitals in The Netherlands. The main reasons are the investment in instrumentation and the complexity of the procedure. Transanal local excision through the flexible port solves both problems. All of the procedures that are currently carried out with transanal endoscopic microsurgery can also be performed through the anal flexible multiple access port.

WHAT IS KNOWN ABOUT ITS EFFECTIVITY?

Currently, few case reports and small series have been published in which radical excision of adenomas and T1-rectum carcinomas have been described without the occurrence of postoperative complications. In 3 patients a postoperative proctoscopy and endo-ultrasonography was performed in which intact sutures without anal sphincter damage was seen.\(^4\) Recently, our study group published the study results of the first 12 patients. There was no difference between the operation time compared to TEM and there were no major complications.\(^5\) It is plausible that the long-term results of the transanal tumour excision with the flexible port are similar to the results after TEM. However, there are still no randomised controlled trials available to confirm this theory.

HOW DIFFICULT IS IT TO LEARN THIS TECHNIQUE?

As with transanal microscopic surgery, the surgeon has a small surgical field with a limited working angle between the instruments. In contrast to TEM, traditional laparoscopic instruments are used to perform transanal tumour excision with the flexible port. The technique is therefore not hard to learn for a laparoscopic surgeon. We estimate a learning curve of 5-10 procedures for an
experienced laparoscopic surgeon or a surgeon with experience in transanal endoscopic microsurgery.

FUTURE PERSPECTIVES

Rectum adenomas which cannot be removed endoscopically (with proctoscopy) can be excised transanally through the flexible multiple access port without the purchase of specialised TEM instrumentation. An increase in the number of rectal villous adenomas is expected after the implementation of the population-based screening programme next year. It is therefore desirable to create a more easy to perform and more accessible procedure. The indication for local excision of rectal cancer will probably grow under the influence of further development of neoadjuvant therapy. Chemoradiation has proven to lead to a complete response of rectum carcinomas in 15-27 percent of the patients. Surgery through the flexible anal multiple access port can be the ideal method for the local excision of the residual lesion.

WHERE IN THE NETHERLANDS?

This surgical technique is already being used in several hospitals in The Netherlands, including the IJsselland Hospital (Capelle aan den IJssel), the Jeroen Bosch Hospital (‘s-Hertogenbosch), the Westfriesgasthuis (Hoorn), and Gelderse Vallei Hospital (Ede).
REFERENCES


