



## Pictorial Review

# Transanal endoscopic microsurgery for rectal cancer



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## ARTICLE INFORMATION

*Article history:*

Received 30 June 2015

Received in revised form

27 September 2015

Accepted 20 October 2015

Since its introduction in the 1980s, total mesorectal excision (TME) has been the standard surgical technique for treating rectal cancer. This procedure involves removing the rectum and the surrounding envelope of fat along the plane of the mesorectal fascia. Resecting this embryological unit reduces the local recurrence rate by removing all local lymph nodes, including those with occult metastatic disease; however, this surgery is associated with mortality and morbidity. Complications include incontinence for patients given an anastomosis, long-term stoma formation, and sexual and bladder dysfunction. Local excision of rectal cancer using the transanal endoscopic microsurgery (TEM) technique is associated with fewer complications, and therefore, is used as an alternative in specific circumstances. We outline the technique, its indications, imaging appearances and complications.

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## Introduction

Since its introduction in the 1980s, total mesorectal excision (TME) has been the standard surgical technique for treating rectal cancer. This procedure involves removing the rectum and the surrounding envelope of fat along the plane of the mesorectal fascia. Resecting this embryological unit reduces the local recurrence rate by removing all local lymph nodes, including those with occult metastatic disease<sup>1</sup>; however, this surgery is associated with mortality and morbidity. Complications include incontinence for patients given an anastomosis, long-term stoma formation, and sexual and bladder dysfunction.<sup>1–4</sup> Local excision of rectal cancer using the transanal endoscopic microsurgery

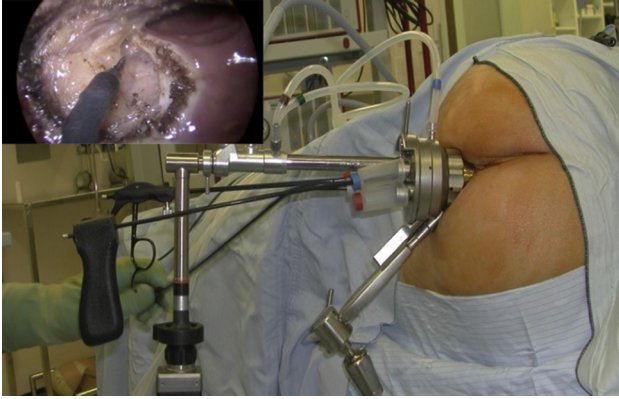
(TEM) technique is associated with fewer complications, and therefore, is used as an alternative in specific circumstances. We outline the technique, its indications, imaging appearances and complications.

## Minimally invasive surgical techniques for rectal cancer

Modern approaches to transanal excision favour the use of an endoscopic platform over traditional Parks' per-anal excision.<sup>5</sup> TEM is an established approach, offering a stable operating platform with magnified stereoscopic view allowing precise full-thickness excision of the rectal wall as far as 15–20 cm from the anal verge<sup>6</sup> (Fig 1). Alternative single-port devices have become available, which are derived from laparoscopic experience, and these are proving to be as effective as TEM approaches<sup>7</sup>; however, it is important that the increased availability of these devices does not alter the selection criteria for this type of surgery.

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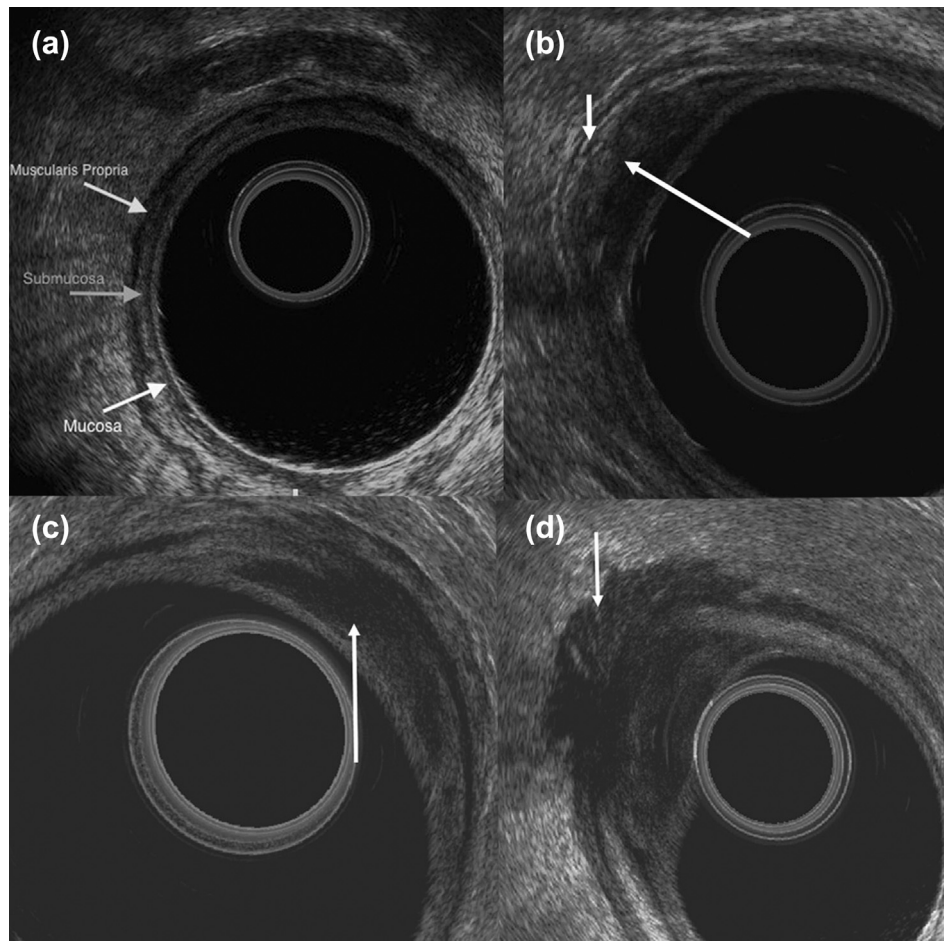


**Figure 1** TEM apparatus *in situ* in a patient in theatre in the right lateral position. Inset shows view obtained during surgery showing a defect in the rectal mucosa. The mesorectal fat is visible through this defect.

The tumour is identified and a full-thickness incision of the rectal wall is made around the tumour with an adequate margin. After the specimen is resected, the defect in the rectal wall is usually closed with sutures, although defects not involving the peritonealised margin may be left open, to close by secondary intention. A modification of the technique for benign carpeting adenomas involves resection of the mucosa only, leaving the muscularis propria intact.

### Strategies for management of rectal cancer

TEM for rectal cancer will remove the primary tumour, but will not remove the mesorectal lymph nodes unlike TME. Preoperative imaging can be used to determine whether malignant lymph nodes are present; however, microscopic lymph node tumour deposits may be present. The risk of lymph node metastases varies with the stage of the primary tumour; nodal positivity is approximately



**Figure 2** EUS images. (a) Normal anatomy. The lumen is distended by a water-filled balloon, which is represented as the black central area on the ultrasound image. The normal layers of the rectal wall have been labelled. (b) A tumour as a hypoechoic mass (long arrow). This extends into the submucosa, but there is a clear area of normal submucosa separating the tumour from the muscularis propria (short arrow). This is therefore T1. (c) A tumour (arrow) that extends into the hypoechoic muscularis propria, i.e., a T2 tumour. (d) A tumour (arrow) that clearly extends through the rectal wall into the mesorectal fat (T3). TEM surgery has the best outcomes in T1 tumours, although may be considered in more advanced tumours where there are extenuating patient circumstances.

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