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Transanal endoscopic microsurgery for rectal tumors: the St. Mary's experience

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Abstract

Background: The aim of this study is to describe a single institution's experience in the use of transanal endoscopic microsurgery for rectal tumors.

Methods: Between 1996 and 2005, transanal endoscopic microsurgery was performed in 76 patients. The histologic diagnosis was adenoma in 48 and adenocarcinoma in 28 patients.

Results: Clear resection margins were achieved in 71 of 74 patients (95.9%). Overall morbidity was 18.9% because 14 patients developed minor (10 patients) or major complications (4 patients). During the follow-up, benign tumor recurrence was detected in 3 patients (6.3%). The recurrence rates among patients with T1, T2, and T3 malignant tumors were 7.1%, 42.8%, and 66.6%, respectively.

Comments: Transanal endoscopic microsurgery is a safe and feasible technique with low incomplete excision rates and may be the preferred method in patients with benign rectal tumors. Its role in the management of malignant tumors should be limited to selected patients with T1 lesions.

Keywords: Local excision; Minimally invasive; Rectal tumors; TEM; TEMS; Transanal endoscopic microsurgery; Transanal excision

Carcinomas and large villous adenomas of the rectum have been traditionally treated by major operations, such as anterior or abdominoperineal resection [1]. Local excision techniques, including the transanal, transsphincteric, or posterior approaches, are well-described alternative methods associated with less postoperative morbidity and mortality [2]. However, for lesions located in the middle and particularly in the upper rectum, the traditional transanal approach is often cumbersome because it allows access to distal tumors only and is associated with high incomplete excision and local recurrence rates [3].

Transanal endoscopic microsurgery (TEMS) is a minimally invasive surgical technique originally designed by Buess et al [4] in the 1980s. TEMS has emerged because it offers several advantages over the traditional transanal excision by providing improved visualization and exposure, permitting more precise resection of tumors located 2 to 22 cm from the anal verge [5]. This technique is primarily used for selected rectal tumors (both malignant and benign) [6]. However, TEMS may also be used for noncurative treatment in patients who are unfit for major surgery or when the cancer has advanced to a stage at which cure by radical resection is unlikely [6]. Prospective series have shown similar morbidity— but shorter length of stay, lower incomplete excision rates, and fewer recurrences—with transanal excision [7,8].

The aim of this study was to describe a single institution's experience with the use of TEMS for both treatment of both benign and malignant rectal disease. The goal was to evaluate its feasibility, morbidity, and recurrence rates.

Materials and Methods

Patients undergoing TEMS between 1996 and 2005 at St Mary's Hospital in London were identified from a prospec-

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Table 1
TEMS: tumor characteristics and outcome

Parameter	Benign tumors (n = 48)	Malignant tumors (n = 28)
Size in cm (mean ± SD)	3.9 ± 1.3	3.1 ± 1.1
Distance from anal verge in cm (mean ± SD)	11.1 ± 2.6	10.5 ± 2
Length of the surgery in min (mean ± SD)	78 ± 15	86 ± 10
Resection margin in mm (mean ± SD)	4.4 ± 3	4.8 ± 4
No. with incomplete excision (%)	2 (4.2)	1 (3.7)
No. with recurrence (%)	3 (6.3)	8 (33.3)

tive colorectal database. During this time period, TEMS was performed in 76 patients with rectal tumors. The mean age of the patients was 66.3 (37 to 91) years. The male-to-female ratio was 48:28.

All patients underwent preoperative endoscopic biopsy and radiologic staging by magnetic resonance imaging and/or endoscopic ultrasound. The preoperative histologic diagnosis was benign adenoma in 54 and adenocarcinoma in 22 patients.

Criteria for patient selection were mobile tumors <5cm in size, occupying <50% of the rectal circumference, and located 4 to 18 cm from the anal verge. TEMS was applied to 2 groups of patients. The first group included patients with a preoperative diagnosis of benign rectal tumor not amenable to endoscopic removal. The second was comprised of a highly selected group of patients with malignant rectal tumors who were unfit for major surgery because of significant comorbidity or advanced age. Also included were patients who had refused radical surgery.

All patients underwent complete bowel preparation before the procedure. Perioperative antibiotic prophylaxis was also administered. The TEMS operative technique was performed as previously described [9–11] using a 40-mm rectoscope with patients under general anesthesia and positioned so that the lesion was orientated at the inferior aspect of the operative field. Carbon dioxide insufflation was used for the pneumorectum. Lesions were excised circumferentially with at least 10-mm macroscopic margins by way of either full or partial thickness excision when the lesions were located in the intraperitoneal rectum. None of the patients of the study received neoadjuvant chemoradiotherapy.

Data prospectively recorded included tumor distance from the anal verge, lesion size, operative time, and final histopathology. Malignant tumors were classified according to the level of extension: Tis = mucosa; T1 = submucosa; T2 = muscularis propria; T3 = perirectal. Complications, resection margins, incomplete excision, and recurrence rates were also reviewed. The presence of tumor within 1 mm of the specimen's margin was classified as a positive margin. Local recurrence was defined as the presence of a neoplasm in proximity to the site of the previous excision on follow-up endoscopy.

The median follow-up in our series was 37 (6 to 96) months. Regarding follow-up, patients were examined at 6-month intervals for the first 2 years after surgery and annually thereafter. Follow-up examination included complete clinical examination as well as rigid sigmoidoscopy. In addition, patients with malignant tumors underwent periodic metastatic work up, and all patients underwent colonoscopic surveillance as per British Society of Gastroenterology guidelines.

Results

Mean operating time was 80.6 (38–180) minutes, and the mean hospital stay was 3.2 (1 to 51) days. Mortality among the patients in our study was 0%. Overall morbidity was 18.4% because 14 patients developed minor or major complications (4 patients or 5.2%). Three patients had perioperative complications, ie, perforation of the intraperitoneal rectum, and the defect could not be closed primarily by way of the TEMS rectoscope. Two of these patients were treated by conversion to anterior resection and the remaining one by defunctioning transverse loop stoma formation. Major complications also consisted of fecal peritonitis on postoperative day 3 in 1 patient who required laparotomy and defunctioning transverse loop stoma formation. Clinical assessment of sphincter function showed early continence impairment to flatus and soiling in 2 patients, but complete continence was restored within 10 weeks in both. Other minor complications included urinary retention in 6, minor bleeding in 5, and pyrexia in 2 patients.

Tumors were located at a mean distance of 10.9 ± 3 cm from the anal verge, with a mean maximal dimension of 3.4 ± 1.5 cm. Postoperative histologic examination of the excised specimens confirmed 48 (63.1%) adenomas and 28 (36.9%) malignant tumors. Six (11.1%) of 54 patients who had a presurgical diagnosis of adenoma had invasive cancer on postoperative histologic examination. Clear resection margins were achieved in 71 of 74 patients (95.9%), whereas the mean resection margin was 4.6 ± 3 mm. The characteristics of the benign and malignant tumours were listed in Table 1.

Forty-eight benign lesions were resected. Mean distance for these tumors from the anal verge was 11.1 ± 2.6 cm, and mean size was 3.9 ± 1.3 cm. Of the 48 lesions, 17 were located in the middle rectum (5–10 cm), and 29 were located in the upper rectum (Fig. 1). Mean length of surgery was 78 ± 15 min. In 1 (2.1%) patient, the procedure was converted to laparotomy and low anterior resection because of perforation of the intraperitoneal rectum. The mean re-

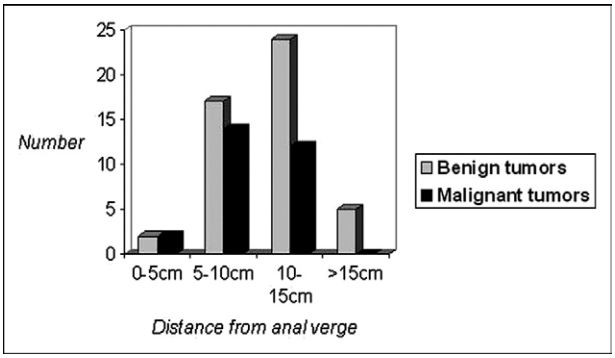

Fig. 1. Distance of tumors from the anal verge.