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## Surgical resection of rectal adenoma: A rapid review

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### Abstract

Transanal excision (TE), endoscopic transanal resection (ETAR) and transanal endoscopic microsurgery (TEM) can be used to remove adenomatous polyps. However, their use is limited by the size or location of the tumor. TE is limited to the lower rectum, TEM offers better access to lesions in the middle and upper rectum, and ETAR is used less frequently than it deserves for resection of rectal lesions.

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### INTRODUCTION

The risk of carcinoma developing in a colorectal polyp of 1 cm or larger is 2.5% and 8% at 5 and 10 years, respectively<sup>[1]</sup>. This potential for malignancy of adenomatous colorectal polyps is an indication for their excision and the first-line treatment is endoscopic removal during the diagnostic procedure, which is safe, relatively

inexpensive, and associated with the lowest complication rate. When the size and/or location of the tumor limits standard endoscopic resection, a number of different transanal approaches are used to remove adenomatous polyps in the lower rectum, but adenomas in the middle or upper rectum are difficult to remove using standard transanal excision (TE) instruments. Different techniques have been developed for the removal of rectal adenomas that are not amenable to removal during colonoscopy.

### TE

TE of lower rectal adenoma, first reported by Parks<sup>[2]</sup>, is one the most frequently adopted approaches for excision of rectal polyps of any dimension, situated as far as 6 cm from the anal verge, and has very few complications, and low recurrence and mortality. In a review of the literature, bleeding after TE was present in up to 10% of the patients, perforation in up to 6%, and anal stenosis in up to 5%, with a mortality rate of 2%<sup>[3-6]</sup>. Recurrence is variable, at 3%-50% for adenoma from adenoma, and up to 3% for carcinoma from adenoma. In a long series of 117 procedures, Sakamoto *et al*<sup>[7]</sup> treated 27% of patients for residual disease and 30% for recurrence, with a 10% rate of serious complications. In a recent study, Pigot *et al*<sup>[8]</sup> obtained better results: they resected apparently benign rectal adenomas from 207 consecutive patients with a 3.6% recurrence rate, eight postoperative complications, and one death. Specific recurrence-free probability was 99.5% at 1 year, 96% at 5 years, and 95% at 10 years.

In the middle and upper third of the rectum, benign lesions are difficult to reach transanally, and standard radical surgical options, such as posterior trans-sphincteric resection, and low anterior resection can be offered to the patient; however, they have been associated with high morbidity, such as anastomotic leakage, sexual dysfunction, and fecal and urinary incontinence.

### POSTERIOR APPROACH

The posterior approach (represented by a combination of coccyx removal and partial sphincter division) has been progressively abandoned. It was indicated for extensive lesions in the anterior rectal wall at a distance of 8-10 cm from the anal verge. Variable rates of complications and very high rates of recurrence have been reported. In a

**Table 1** Resection of apparent adenoma polyps by ETAR

Ref.	Patients	ETAR	Recurrence	No. of complication patients	Failure	Follow-up (mo)	Related mortality
Tuech <i>et al</i> <sup>[11]</sup>	28	39	2	6	-	60 (2.5-10.5)	0
Beattie <i>et al</i> <sup>[12]</sup>	11	30	0	-	-	-	0
Wetherall <i>et al</i> <sup>[13]</sup>	23	38	2	-	1	4.5 (2-42)	0
Dickinson <i>et al</i> <sup>[14]</sup>	38	62	1	10	-	-	1
Sutton <i>et al</i> <sup>[15]</sup>	60	102	4	-	2	-	0
Bujanda <i>et al</i> <sup>[16]</sup>	13	13	1	2	-	15 (3-24)	-
Tsai <i>et al</i> <sup>[17]</sup>	131	180	27	7	-	60	0
Total	304	464	37	25	3		1

**Table 2** Adenoma resected by TEM

Ref.	No. of lesions	Residual adenoma in surgical margin (%)	Local recurrence (%)	Follow-up (mo)
Steele <i>et al</i> <sup>[20]</sup>	77	9	5.1	7.4
Farmer <i>et al</i> <sup>[21]</sup>	36	25	5.6	33
Nakagoe <i>et al</i> <sup>[22]</sup>	9	0	0	d.n.o
Cocilovo <i>et al</i> <sup>[23]</sup>	56	1.7	3.5	d.n.o
Neary <i>et al</i> <sup>[24]</sup>	21	0	4.7	d.n.o
Katti <i>et al</i> <sup>[25]</sup>	58	7	10	34
Vorobiev <i>et al</i> <sup>[26]</sup>	113	-	8.3	29.5
Bretagnol <i>et al</i> <sup>[27]</sup>	148	14.9	7.6	33
Endreseth <i>et al</i> <sup>[28]</sup>	64	20	13	24
Zacharakis <i>et al</i> <sup>[29]</sup>	48	4.2	6.3	37
Schäfer <i>et al</i> <sup>[30]</sup>	33	18	12	36.4
Rökke <i>et al</i> <sup>[31]</sup>	56	10	0	12
Guerrieri <i>et al</i> <sup>[32]</sup>	530	-	4.3	44
McCloud <i>et al</i> <sup>[33]</sup>	75	37.3	16	31
Whitehouse <i>et al</i> <sup>[34]</sup>	146	5.5	4.8	39
Platell <i>et al</i> <sup>[35]</sup>	62	-	2.4	24
Lloyd <i>et al</i> <sup>[36]</sup>	68	9	5.9	28.7
Ganai <i>et al</i> <sup>[37]</sup>	82	10	15	44

d.n.o: Data not obtained.

review of 360 cases treated for benign and malignant lesions, fecal fistula was the most frequent complication in 5%-70% of patients and fecal incontinence in 5%-25%<sup>[3,9]</sup>. Adenoma recurrence rate was up to 33% and a stoma was necessary in 20%-70% of patients, as a temporary stoma to avoid fecal fistula or as a therapeutic stoma after its appearance<sup>[3,9]</sup>.

## ENDOSCOPIC TRANSANAL RESECTION (ETAR)

ETAR was first described in 1977 by Lindenschmidt *et al*<sup>[10]</sup> and has been used in the resection of rectal adenoma. A review of 304 cases (464 procedures) from seven studies, most of them in the United Kingdom, with probable double recording of patients (Table 1), suggests that ETAR is valuable in the resection of rectal adenoma with low morbidity and mortality. This technique has shown low recurrence, however, it is impossible to know if the resection is complete and the margins are free of tumor after various procedures in the same patient from whom the adenoma is resected piecemeal. ETAR does not require surgical assistance, anesthesia, extreme positioning, new technology or special training. Nevertheless, this technique provides limited resection of mesorectal fat and lymph nodes,

limited histopathological information regarding extent of resection, and poor local disease control.

## TRANSANAL ENDOSCOPIC MICROSURGERY (TEM)

TEM has been used successfully in the management of rectal adenoma and in selected cases of rectal carcinoma, since it was introduced by Professor Buess in 1984<sup>[18]</sup>. It has been suggested that TEM enables local excision of adenomas up to 24 cm from the anal verge, and offers a minimally invasive alternative to TE, radical surgery and recurrence from previously used endoscopic resection, with superior endoscopic magnification and illumination, accuracy and complete resection, and secure suture closure.

TEM has produced satisfactory results, with better recurrence rates and low morbidity and mortality. In one of the largest studies of adenoma resection using TEM, the authors reported a 3.4% early postoperative complication rate and 1.2% and 7% recurrence rates after 1 and 5 years, respectively, in a series of 286 cases<sup>[19]</sup>. In a review of 1682 adenoma resection procedures from 18 studies (Table 2), an average of 11% of the patients were found to have residual adenoma in the surgical margin, 6.3% had recurrence, and the complication rate was up to 11% during a follow-up period of 12 mo in one series, and > 24 mo in the rest of the studies.

The histologically positive resection margin is highly significant in terms of local recurrence rates after adenoma resection. In a review of 18 studies with a minimum follow-up of 12 mo (Table 2), I have found that residual adenoma in the surgical margin varied from 0% to 37.3%. However, the recurrence rate was 0%-15%, predominantly in cases with positive or uncertain resection margins. In three large series, it has been found that adenoma recurrence rate is high in the incompletely resected group (37.7%, 46% and 25%) compared with that in patients with free histological margins after adenoma resection (4.3%, 3% and 3.7%, respectively)<sup>[28,33,34]</sup>. In another two studies, adenoma extending to the surgical margin of locally excised polyps was found in 25%<sup>[21]</sup> and 30.7% of cases<sup>[38]</sup>. The latter was a large series of 238 patients (226 patients treated by TEM and 12 by TE). It is remarkable that, with such high positive-residual-margin rates, the recurrence rates in these studies were only 5.6% after 33 mo follow-up<sup>[21]</sup> and 3.6% after 67.5 mo follow-up<sup>[38]</sup>, which are lower

than the rates reported in studies with lower positive-residual-margin rates. Røkke *et al*<sup>[31]</sup> did not observe adenoma recurrence after 12 mo follow-up in a series of patients in whom the residual adenoma in surgical margin was 10%.

Even for recurrent adenoma, TEM has now become an important alternative treatment. Five series have reported the use of TEM in the treatment of recurrent adenoma or residual disease without further recurrence<sup>[25,26,32,33,35]</sup>.

In five studies that have compared adenoma resection with TEM and another procedure, the lower or similar recurrence, residual tumor and early complication rates favor TEM resection<sup>[22,38-40]</sup>. Late complication rates were higher after TEM because of the increased incidence of transient incontinence in the postoperative period<sup>[39,40]</sup>. Recently, Moore *et al*<sup>[41]</sup> have compared rectal adenoma excision with TEM and TE, and concluded that TEM is more effective than the other technique, because they found a significantly higher rate of clear margin with less fragmented specimens after TEM, with low complication and recurrence rates.

## CONCLUSION

The transanal approach is a feasible, frequently used technique with few complications and low recurrence and mortality, but its use is limited to the lower rectum. The posterior approach with coccygeal resection, with or without sphincter section, can be mentioned only anecdotally in colorectal surgery. Probably very few surgeons are using it because of its high morbidity and recurrence and the use of colostomy. ETAR is a forgotten minimally invasive technique. It is a simple and safe method and technical expertise has already been acquired on urological conditions such as bladder and prostate tumors, however, it is used less frequently than it deserves for resection of rectal lesions. This is probably because few colorectal surgeons have much enthusiasm for the multiple sessions and piecemeal resection using a resectoscope. TEM offers better access to lesions in the middle and upper rectum, with superior endoscopic magnification and better illumination, superior visualization and pneumorectum, with accurate and complete resection allowing better histological analysis, and secure suture closure. The benefits of TEM are: few complications; low recurrence and mortality; less postoperative pain and use of analgesia; shorter time to the patient being able to walk, sit, eat and defecate; shorter hospital stay; and avoidance of colostomy. These benefits can compensate for the high price of the instruments.

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