

Transanal endoscopic microsurgery: results of the first 50 cases

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The aim of the study was to share the experience and first results of implementation of transanal endoscopic microsurgery (TEM) technique for the removal of rectal adenomas, early rectal cancer or rectal stricture in the Center of Oncosurgery, Oncology Institute of Vilnius University.

Materials and methods. From October 2009 to October 2011, a total of 50 patients underwent TEM for rectal adenomas, early rectal cancer or rectal stricture. The patients were 25 women and 25 men, 31 to 87 years of age (average 65 years). Rectal lesions were from 0.9 to 7.0 cm in diameter, 3–13 cm from the anal verge. Full thickness excision with 1 cm safety margin was achieved in all cases except two (mucosal excision), followed by closing of the rectal wall defect in one-layer running monocryl 3.0 suture using silver clips. In one case (TEM was performed for T2 rectal cancer), abdominal cavity was penetrated and two-layer closure was preferred.

Results. In these series of 50 patients there was 1 (2%) complication (cystitis). No postoperative exitus occurred. The hospitalisation period ranged from 2 to 13 days (average 6 days). Final histology revealed 30 (60%) tubular or villous adenomas, 6 (12%) carcinomas *in situ* (pTis), 7 (14%) T1, 4 (8%) T2 cancers, and well-differentiated neuroendocrine tumors in 3 (6%) were diagnosed. One patient underwent open partial TME in pT1 group; the tumor was in the upper third of rectum and preoperatively evaluated as pTis disease. In two cases (pT1 group) lymphovascular invasion was present on final pathology, so they were offered a postoperative adjuvant chemoradiotherapy. Other 4 patients in T1 group are under surveillance.

All 4 patients with T2 lesions were offered adjuvant chemoradiotherapy, one patient refused further treatment.

Conclusions. TEM is an alternative for transanal excision of rectal adenomas and early rectal cancer. Further follow-up is necessary to evaluate the recurrence rate of cancer in invasive cancer patients group.

Key words: rectal polyp, rectal cancer, transanal endoscopic microsurgery (TEM)

INTRODUCTION

Transanal endoscopic microsurgery (TEM) was introduced by Gerhard Buess from Germany in 1983 (1). Since then it has been widely used as an alternative to local excision or major abdominal surgery for benign rectal lesions and early rectal cancer. It offers a very attractive combination of minimally invasive local treatment with large full-thickness local excision under improved vision with gentle tissue handling. Its role in removal of rectal polyps seems to be not debatable, but the true place in local treatment of rectal cancer is yet to be determined due to less optimal oncological outcomes (2, 3). One of the shortcomings of this technique has been related with high costs of the complex equipment, which seems to be possible to overcome in future using a single port access via anus and standard laparoscopic instruments (4, 5). The aim of our study was to evaluate our early experience with conventional TEM.

MATERIALS AND METHODS

From 7 October 2009 to 1 October 2011 a total of 50 patients underwent TEM for rectal adenomas, early rectal cancer or rectal stricture. 25 were women and 25 men, age range was 31 to 87 years (average 65 years). Rectal lesions were from 0.9 to 7.0 cm in diameter, 3–13 cm from the anal verge. In case benign adenoma was diagnosed, proctoscopy with biopsy was followed by total colonoscopy. In case of malignant lesions, all patients additionally underwent pelvic magnetic resonance imaging (MRI) and endorectal ultrasound, as well as abdominal ultrasound and chest X-ray for the disease extension evaluation.

All operations were performed under general anesthesia, in lithotomy, prone jack-knife, left lateral or right lateral position (depending on the exact location of the tumor). Standard TEM equipment was used. Full thickness excision with 1 cm safety margin was attempted in all but two cases (mucosal excision), followed by closing of the rectal wall defect in one-layer running monocryl 3.0 suture using silver clips. In one case (TEM was performed for T2 rectal cancer), abdominal cavity was penetrated and two-layer closure was preferred.

All patients operated for rectal adenocarcinoma were offered TEM as an alternative to open total

mesorectal excision (TEM). These tumors were less than 3 cm in diameter, well or moderately differentiated with no histological signs of poor prognosis on preoperative biopsy. 3 patients were operated for well-differentiated neuroendocrine tumors: two were offered TEM after snare polypectomy of the lesion thought to be rectal adenoma, and one for the same condition diagnosed by biopsy; in all cases tumor was less than 1 cm in diameter. One patient was operated for 1 cm rectal stricture 1.5 years after total mesorectal excision for rectal cancer after failed multiple dilatations.

RESULTS

In these series of 50 patients there was only 1 (2%) complication – cystitis. No deaths occurred. The hospitalization period ranged from 2 to 13 days (average 6 days). Final histology revealed 30 (60%) tubular or villous adenomas, 6 (12%) carcinomas *in situ* (pTis), 7 (14%) T1 cancers, 4 (8%) T2 cancers and well-differentiated neuroendocrine tumors in 3 (6%) cases (Table).

Table. Pathology in 50 patients undergoing TEM

Final pathology	Number of patients (%)
Tubular of tubulovillous adenoma	30 (60%)
Ptis	6 (12%)
T1	7 (14%)
T2	4 (8%)
Well-differentiated neuroendocrine tumor	3 (6%)
Total cases	50 (100%)

In all cases operated for malignant lesions, the safety margin was not compromised and in all but one case (T1 group) final histology was favorable (well or moderately differentiated, no lymphovascular invasion). In pT1 group one patient aged 60 was operated for upper rectal third cancer, and open partial TME was proposed and performed; no residual tumor or positive lymph nodes were detected. Preoperatively her histology was pTis. In two cases (pT1 group) lymphovascular invasion was present on final pathology, and they were sent for postoperative adjuvant chemoradiotherapy. Other 4 patients in T1 group are under surveillance.

From 4 patients in T2 two patients (87 year old male and 67 year old female) underwent TEM as a compromised treatment due to significant comorbidities. In other two cases tumors were understaged as T1 during preoperative evaluation. All were offered adjuvant chemoradiotherapy, and all but one underwent it. A 87 year old male refused any other therapy or surveillance.

All patients after TEM are in postoperative surveillance protocol which includes rigid proctoscopy (plus endorectal ultrasound in the group with invasive cancer) every 3 months during the first two years. So far, no recurrent or progressing disease was determined.

DISCUSSION

TEM seems to be an alternative for removal of benign rectal lesions compared to transanal excision or major abdominal resection. However, regardless of a large number of articles in current literature, the superiority of TEM compared to transanal excision has not been demonstrated until recently, when de Graf EJR et al. (6) demonstrated a statistically significant difference comparing postoperative morbidity between the two procedures (5.3% and 10% respectively). The superiority of either transanal excision or TEM compared to abdominal resection has been recorded by many authors including Langer C et al. (7), who, however, did not show a statistically significant difference in this respect between the two options of the transanal approach. For most of our patients in case TEM is not available, a conventional transanal excision would be offered, excluding several cases when adenomas are located in the upper part of rectum. For the latter group of patients, abdominal resection would be the benefit. As well, we attempted to perform most of our TEM for benign polyps to avoid a negative possible impact of learning curve to oncological outcomes.

While managing patients with rectal cancer, our primary and most important aims are as follows: local control of the disease, prevention of distal spread, long-term survival, preservation of normal defecation route, avoidance of damage to sexual and urinary function and good overall quality of life. Total mesorectal excision is a gold standard today for rectal cancer treatment in terms of local control,

prevention of distal spread and long-term survival, but it may result in permanent stoma and a significant chance of sexual and urinary dysfunction, and adversely affect the quality of life. Accepted low-risk criteria in T1 rectal carcinoma suitable for local treatment are well or moderately differentiated lesions, smaller than 3 cm in diameter and with no signs of lymphovascular invasion. Those were principles used in our series too. However, further on a negative resection margin may be a factor of major importance (8). As pointed out by Borshitz T et al. (9), in case of a negative resection margin excising pT1 rectal cancer was obtained, the percent of recurrences was only 4%; if the resection margin was less than 1 mm, unknown or positive, the recurrence rate was as high as 46%. In our comparatively small group with early rectal cancer, a negative resection margin was achieved in all cases. Only two patients from T1 group due to unfavorable final histology both did not accept surgery which would have been abdominoperineal excision and were offered chemoradiation. Otherwise, immediate radical surgery in irradically excised rectal pT1 carcinomas may result in good survival rates (9).

If for properly selected pT1 rectal cancer adequate TEM alone seems to be a good method of treatment, pT2 cancers harbor a much more difficult problem. In any rectal cancer case, the main difference between TEM and total mesorectal excision is the omission of proper lymph node dissection in TEM. This residual cancer bearing lymph node may give a rise to local recurrence. Up to date, conventional staging modalities failed to give a proper solution to this problem. As nicely demonstrated, early pT1 or pT2 rectal cancers are likely to have a small lymph node metastasis not easily identified by endorectal ultrasound, which may explain a relatively high rates of recurrence after local excision (10). As for transanal excision in pT2 lesions, local therapy alone is related with high risk of local recurrence (11–15) and therefore is inadequate with intent to cure. Some authors demonstrated good results while adding an adjuvant radiotherapy (16). A more recent strategy may be neoadjuvant chemoradiation followed by TEM for selected rectal pT2 cancer patients (17). Our strategy in current series was not to leave a single patient without further treatment if pT2 cancer was found in final histology.

CONCLUSIONS

TEM is an alternative to transanal excision for rectal adenomas and early rectal cancer. Further follow-up is necessary to evaluate recurrence rates and oncological results in a subgroup of patients with invasive rectal cancer.

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References

1. Buess G, Theiss R, Hutterer F, Pichlmaier H, Pelz C, Holfeld T, et al. Die transanale endoskopische Rektumoperation. Erprobung einer neuen Methode im Tierversuch. *Leber Magen Darm*. 1983; 13: 73–7.
2. Mellgren A, Sirivongs P, Rothenberger DA, Madoff RD, Garcia-Aguilar J. Is local excision adequate for early rectal cancer? *Dis Colon Remtum*. 2000; 43: 1064–74.
3. Rothenberger DA, Garcia-Aguilar J. The role of the local excision in the treatment of rectal cancer. *Semin Surg Oncol*. 2000; 19: 367–75.
4. Khoo REH. Transanal excision of a rectal adenoma using single-access laparoscopic port. *Dis Colon Remtum*. 2010; 53: 1078–9.
5. Lorenz C, Nimmesgen T, Back M, Langwieler TE. Transanal single port microsurgery (TSPM) as a modified technique for transanal endoscopic microsurgery (TEM). *Surg Innov*. 2010; 17(2): 160–3.
6. De Graaf EJR, Burger JWA, Ijsseldik ALA, Tetteroo GWM, Dawson I, Hop WCJ. Transanal endoscopic microsurgery is superior to transanal excision of rectal adenomas. *Colorectal Dis*. 2011; 13: 762–7.
7. Langer C, Liersch T, Suss M, Siemer A, Markus P, Ghadimi BM, et al. Surgical cure for early rectal carcinoma and large adenoma: transanal endoscopic microsurgery (using ultrasound or electrosurgery) compared to conventional local and radical resection. *Int J Colorectal Dis*. 2003; 18: 222–9.
8. Endreth BH, Myrvold HE, Romundstad P, Hesvik UE, Bjerkeset T, Wibe A. Transanal excision versus major surgery for T1 rectal cancer. *Dis Colon Remtum*. 2005; 48: 1380–8.
9. Borshitz T, Heinz A, Junginger T. The influence of histopathologic criteria on the long-term prognosis of locally excised pT1 rectal carcinomas: results of local excision (transanal endoscopic microsurgery) and immediate reoperation. *Dis Colon Remtum*. 2006; 48: 1380–8.
10. Landmann RG, Wong WD, Hoepfl J, Shia J, Guillem JG, Temple LK, et al. Limitations of early rectal cancer nodal staging may explain local failure after local excision. *Dis Colon Remtum*. 2007; 50: 1520–5.
11. Zieren J, Paul M, Menenakos S. Transanal endoscopic microsurgery (TEM) vs. radical surgery (RS) in the treatment of rectal cancer: indications, limitations, perspectives. A review. *Acta Gastroenterol Belg*. 2007; 70: 374–80.
12. Garcia-Aguilar J, Mellgren A, Sirivongs P, Buie D, Madoff RD, Rothenberg DA. Local excision of rectal cancer without adjuvant therapy: a word of caution. *Ann Surg*. 2000; 231: 345–51.
13. Taylor RH, Hay JH, Larsson SN. Transanal local excision of selected low rectal cancers. *Am J Surg*. 1998; 175: 360–3.
14. Bleday R, Breen E, Jessup JM, Burgess A, Sentovich SM, Steele G. Prospective evaluation of local excision of small rectal cancers. *Dis Colon Remtum*. 1997; 40: 388–92.
15. Stipa F, Lucandri G, Ferri M, Casula G, Ziparo V. Local excision of rectal cancer with transanal endoscopic microsurgery (TEM). *Anticancer Res*. 2004; 24: 1167–72.
16. Duek SD, Issa N, Hershko DD, Krausz MM. Outcome of transanal endoscopic microsurgery and adjuvant radiotherapy in patients with T2 rectal cancer. *Dis Colon Remtum*. 2008; 51: 379–84.
17. Lezoche G, Guerrieri M, Baldarelli M, Paganini AM, D'Ambrosio G, Campagnacci R, Bartolacci S, Lezoche E. Transanal endoscopic microsurgery for 135 patients with small nonadvanced low rectal cancer (iT1-iT2, iN0): short- and long-term results. *Surg Endosc*. 2011; 25: 1222–9.

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TRANSANALINĖ ENDOSKOPINĖ MIKROCHIRURGIJA: PIRMŪJŲ 50 ATVEJŲ REZULTATAI

Santrauka

Tyrimo tikslas – pasidalyti patirtimi ir pirmaisiais transanalinės endoskopinės mikrochirurgijos (TEM) rezultatais gydant tiesiosios žarnos adenomas, ankstyvąjį tiesiosios žarnos vėžį ir tiesiosios žarnos striktūras Vilniaus universiteto Onkologijos instituto Onkochirurgijos centre.

Pacientai ir metodai. Nuo 2009 m. spalio iki 2011 m. spalio mėnesio naudojant TEM techniką dėl tiesiosios žarnos adenomų, ankstyvojo tiesiosios žarnos vėžio ar tiesiosios žarnos striktūros buvo operuota 50 pacientų (25 moterys ir 25 vyrai, amžius nuo 31 iki 87 metų, amžiaus vidurkis 65 metai). Tiesiosios žarnos pakitimai buvo nuo 0,9 iki 7,0 cm, atstumas nuo išangės – 3–13 cm. Viso tiesiosios žarnos storio ekscizija atlikta 48 atvejais iš 50 (dviem atvejais atlikta gleivinės rezekcija dėl adenomų), defektai susiūti ištisine monocryl 3,0 siūle su sidabro kabutėmis. Vienam pacientui (TEM atlikta dėl T2 tiesiosios žarnos vėžio) atsivėrė pilvo ertmė, todėl defektas susiūtas dviejų aukštų analogiška siūle.

Rezultatai. Iš 50 operuotųjų pooperacinė eiga komplikavosi vienam pacientui (2 %, cistitas); mirčių nebuvo. Hospitalizacijos trukmė – nuo 2 iki 13 dienų (vidutiniškai 6 dienos). Galutinės histologijos duomenimis, 30 (60 %) atvejų buvo tubulinės ar tubulovilizinės adenomos, 6 (12 %) karcinomos *in situ* atvejai (pTis), 7 (14 %) pT1 atvejai, 4 (8 %) T2 vėžio ir 3 (6 %) gerai diferencijuotos neuroendokrininės karcinomos atvejai; vienas (2 %) tiesiosios žarnos striktūros atvejis. Vienai pT1 grupės 60 metų amžiaus pacientei, operuotai dėl tiesiosios žarnos viršutinio trečdaliao vėžio (iki operacijos pTis), atlikta dalinė mezorektalinė ekscizija. Dviem atvejais (pT1 grupė) pooperaciniuose preparatuose nustatyta limfovaskulinė invazija, todėl paskirtas pooperacinis smulkiafrakcinis spindulinis gydymas. Tęsiama penkių pT1 grupės pacientų stebėseną.

Visiems keturiems pT2 grupės pacientams paskirtas smulkiafrakcinis spindulinis gydymas; vienas iš jų šio gydymo ir stebėsenos atsisakė.

Išvados. TEM yra alternatyva gydant tiesiosios žarnos adenomas ir tiesiosios žarnos vėžį. Norint įvertinti recidyvų procentą bei onkologinius rezultatus, reikalinga tolesnė pacientų, sirgusių tiesiosios žarnos invaziniu vėžiu, stebėseną.

Raktažodžiai: tiesiosios žarnos polipas, tiesiosios žarnos vėžys, transanalinė endoskopinė mikrochirurgija