

Middle East Experience With Transanal Endoscopic Microsurgery (TEM)

Seyed Vahid Hosseini¹; Reza Roshanravan¹; Salar Rahimikazerooni^{1,*}; Mastoureh Mohammadipour²; Ali Saberi²; Hossein Shabahang³; Ali Reza Safarpour¹; Leila Ghahramani¹

¹Colorectal Research Center, Shiraz University of Medical Sciences, Shiraz, IR Iran

²Department of Colorectal Surgery, Shiraz University of Medical Sciences, Shiraz, IR Iran

³Department of Colorectal Surgery, Mashhad University of Medical Sciences, Mashhad, IR Iran

*Corresponding author: Salar Rahimikazerooni, Colorectal Research Center, Shiraz University of Medical Sciences, Shiraz, IR Iran. Tel: +98-7112306972, Fax: +98-7112330724, E-mail: rahimiks@sums.ac.ir, colorectal92@yahoo.com

Received: March 17, 2014; Revised: April 14, 2014; Accepted: April 14, 2014

Background: Transanal Endoscopic Microsurgery (TEM) has been a new method of micro invasive surgery for management of special conditions. Big deal of this procedure is avoiding of open abdominal surgeries or better exposure in transanal approaches.

Objectives: The purpose of this study was to present a single institutional experience in Shiraz, Iran regarding the application of Transanal Endoscopic Microsurgery (TEM). To our knowledge this is the first report from the Middle East.

Patients and Methods: Between 2009 and 2012, thirty patients underwent TEM in our center. We assessed complications and recurrence rate. Patients with fewer than six months of follow-up were excluded.

Results: Patients included 17 men and 13 women with a mean age of 44.4 years (ranged 17-80). The mean tumor distance from the anal verge was 9.8 cm. One patient with adenomatous polyp experienced recurrence 14 months postoperatively. Regarding procedure-related complications, one case developed hemorrhage and another case fever and infection in the site of operation. Two patients experienced incontinence for about 3 weeks after TEM surgery.

Conclusions: Considering the cultural and religious context of the Middle East, we recommend TEM procedure in specialized centers in this region of the world.

Keywords: Rectal Neoplasms; Colorectal Surgery; Microsurgery; Endoscopy; Therapeutics

1. Background

Radical resection is known as the gold standard for the treatment of rectal cancer but causes high rate of morbidity and mortality (1-3). Transanal Excision (TAE) of rectal tumors offers several advantages. However, it has some limitations such as poor visualization and limited access to the rectum (4, 5). The advent of Transanal Endoscopic Microsurgery (TEM) eliminated some of these limitations and triggered a consistent improvement in local excision of rectal lesions (6). TEM was introduced by Buess more than 25 years ago (7). It provides a three-dimensional vision and the ability to do various surgical maneuvers including precise dissection and suturing up to 22cm above the anal verge (6, 8-10).

TEM was initially used to remove benign adenomas (11). In the course of time, surgeons gradually employed it in the treatment of early stage rectal carcinomas (11). Several studies reported the advantages of TEM in comparison with TAE (8). These advantages include a clear resection margin and a lower recurrence rate (4, 12). In addition,

like other minimally invasive techniques it has more acceptance and needs shorter hospitalization (13).

Despite these advantages, TEM is not a widely used method in developing countries, probably because of the high initial cost and the need for additional training (4). On the other hand, considering the increased incidence of colorectal cancers in this area, there are more patients who may benefit from this procedure (14). Unfortunately, many patients have to undergo radical excision treatment and therefore, so may avoided encounter more morbidity.

2. Objectives

There are few centers in which TEM procedure is performed to remove rectal lesions in the Middle East. In our institution in Shiraz, southern Iran, TEM has been performed for selected patients since 3 years ago. In this study, we reported the outcomes of our experience. To the best of our knowledge, it is the first report of TEM from the Middle East.

Implication for health policy/practice/research/medical education:

This manuscript would be useful for colorectal and general surgeons and internists.

Copyright © 2014, Colorectal Research Center and Health Policy Research Center of Shiraz University of Medical Sciences; Published by Safnek. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

3. Patients and Methods

This was a cross sectional descriptive in which data was extracted from a prospective database. Records of all patients undergoing TEM in Shahid Faghihi hospital, Shiraz, Iran were. All information was updated weekly by means of medical records, patients and documentations by the operating surgeon. Patients with metastatic disease on arrival and less than 6 months of follow-up were excluded.

At our center, patients with solitary rectal ulcer (SRU), benign tumor, T1 adenocarcinoma and carcinoid tumor were offered TEM as a curative procedure. Although, patients with more advanced adenocarcinomas were underwent TEM if he or she refused radical resection. Preoperative assessment including history taking, physical examination, chest radiography, colonoscopy and biopsy was performed for all patients. Endorectal ultra sound or Magnetic Resonance Imaging (MRI) was used for cancer staging. Level and location of lesions were determined by rigid sigmoidoscopy. All cases were operated by a single surgeon. He explained the surgical technique and potential complications to each patient. All patients signed an informed consent form.

4. Results

Thirty patients, 17 males and 13 females with the mean age of 44.4 years old (ranged 17-80) were included in our study. Regarding preoperative signs and symptoms, 25 cases (83.3%) complained of rectal bleeding, 15 (50%) had pain, 9 (30%) had constipation, 8 (27%) experienced change in bowl habit, 5 (17%) had difficulty in defecation and two cases (7%) complained of mucosal discharge.

Preoperative rigid sigmoidoscopy showed anterior lesion in seven patients, posterior in nine, lateral in 12 and circumferential lesion in two patients. The mean distance of lesions from the anal verge was 9.8 cm (ranged 6-15 cm). Microscopic evaluation revealed pre-cancerous dysplasia in 4 cases, benign polyp in 12 and inflammation (SRU) in 9 cases. Moreover, five patients had well differentiated adenocarcinoma; of which two were T3 and therefore laparoscopic low anterior resection was performed within two weeks. One case with T4 N1 adenocarcinoma underwent palliative TEM. This case was the only one who experienced bleeding from the site of operation with no need to any intervention. Postoperatively, none of patients had mucosal discharge, one case developed fever and infection in the site of operation and so was treated with medical therapy. Two patients had transient gas incontinence that was recovered after 3 weeks. They were from cases who had SRU in posterior part of rectum and distance from anal verge were 6 cm in both of them.

5. Discussion

Findings of this study of a single institutional experience with TEM procedure in Shiraz, Iran showed similar results with those of developed countries. There are sev-

eral studies, which reported lower complication rate and more importantly lower recurrence rate following TEM (15-17). Hemorrhage, fecal incontinence, fever and suture line dehiscence are the most prevalent procedure-related morbidities after TEM (18). Hemorrhage is perceived as the most common morbidity with a prevalence of 1.5% to 13%. Recurrence is reported in about 5% of patients with adenoma and T1 adenocarcinoma (11, 15). To illustrate, Ben and his colleagues reported the outcomes of 269 patients who underwent TEM for benign and malignant rectal tumors in Minneapolis, Minnesota. Only 1.5% of cases developed post-operation bleeding who required intervention and 1.5% suture line dehiscence. In our study, patients encountered fewer complications (15).

There are several studies that recommend TEM as one of the best methods for local excision of early stage rectal cancers and other rectal lesions. Several reasons have been proposed to support TEM (9, 18-21). Firstly, this technique offers all the benefits of other minimally invasive methods. Furthermore, shorter hospital stay, less postoperative pain, less morbidity and no report of mortality till now are among other advantages (4, 11, 13, 15, 22).

Secondly, technological features of TEM such as magnified stereoscopic view help in full-thickness resection with adequate clear margin (6). Some authors regarded this as the main reason which decreases the recurrence rate after TEM surgery, especially in T1 adenocarcinomas (12). Intact and non-fragmented specimen resection has been noted as other advantage of this technique, which lowers the recurrence rate (8). In our study, one patient with polyp experienced recurrence at the same site 14 months after the operation. Although, he underwent TEM operation again and did not recur within 7 months after the operation. Patients with other lesions such as T1 adenocarcinoma did not have recurrence by the time of writing this report. A randomized trial study was performed by Winde et al. which compared the outcomes of TEM and open radical surgery for T1 rectal cancers. They reported no statistically significant difference of local recurrence, metastasis and 5-year survival between the two groups (11, 23). Another research conducted by Kinoshita et al. reported findings of TEM procedure in 27 patients with rectal carcinoid tumor. After a mean follow-up of 70 months, none of patients developed recurrence (24).

The other advantage of TEM which made it more attractive to surgeons is preserving the function of anal sphincter, thus reducing sphincteric morbidities (9). Obviously, fecal incontinence is one of the most important morbidities of rectal surgeries, which is more devastating in developing countries, particularly for women. This makes some patients refuse surgeries causing incontinence to avoid social problems. Authors of this article believe that it might be more in Muslim countries because of religious beliefs.

Short mean follow-up time and limited number of cases in each group were weakness of our study. However, since this is the first report of application of TEM for rectal le-

sions from the Middle East, it might be useful and encouraging for surgeons, especially in this area. In conclusion, we believe that TEM is a safe and effective method for resection of selected benign and malignant rectal lesions. It has the potential to gain more popularity in the Middle East, particularly because of cultural and religious context of this part of the world. As a result, it is recommended to perform this technique in more specialized centers.

Acknowledgements

This manuscript was supported by the research vice-chancellor of Shiraz University of Medical Sciences. The authors would like to express their gratitude to this vice-chancellery for financially supporting the study.

Authors' Contribution

Study concept and design: Dr. Seyed vahid Hoseini, Dr. Abbas Rezaianzadeh, Dr. Hossein Shabahang, Dr. Leila Ghahramani. Acquisition of data: Dr. Abbas Rezaianzadeh, Dr. Reza Roshanravan, Dr. Salar Rahimikazerooni, Dr. Mastoureh Mohammadipour, Dr. Ali Saberi, Dr. Ali Reza Safarpour. Analysis and interpretation of data: Dr. Abbas Rezaianzadeh, Dr. Reza Roshanravan, Dr. Salar Rahimikazerooni, Dr. Mastoureh Mohammadipour, Dr. Ali Saberi, Dr. Ali Reza Safarpour. Drafting of the manuscript: Dr. Seyed vahid Hoseini, Dr. Abbas Rezaianzadeh, Dr. Hossein Shabahang, Dr. Leila Ghahramani, Dr. Reza Roshanravan, Dr. Salar Rahimikazerooni, Dr. Mastoureh Mohammadipour, Dr. Ali Saberi, Dr. Ali Reza Safarpour. Critical revision of the manuscript for important intellectual content: Dr. Seyed vahid Hoseini, Dr. Abbas Rezaianzadeh, Dr. Hossein Shabahang, Dr. Leila Ghahramani, Dr. Reza Roshanravan, Dr. Salar Rahimikazerooni, Dr. Mastoureh Mohammadipour, Dr. Ali Saberi, Dr. Ali Reza Safarpour. Statistical analysis: Dr. Abbas Rezaianzadeh, and Dr. Ali Reza Safarpour. Administrative, technical, and material support: Dr. Seyed vahid Hoseini, Dr. Abbas Rezaianzadeh, Dr. Hossein Shabahang, Dr. Leila Ghahramani.

Financial Disclosure

There was no conflict of interest.

Funding/Support

This research was supported by the research vice-chancellor of Shiraz University of Medical Sciences.

References

- Suppiah A, Maslekar S, Alabi A, Hartley JE, Monson JR. Transanal endoscopic microsurgery in early rectal cancer: time for a trial? *Colorectal Dis.* 2008;**10**(4):314-27.
- Nastro P, Beral D, Hartley J, Monson JR. Local excision of rectal cancer: review of literature. *Dig Surg.* 2005;**22**(1-2):6-15.
- Omidvari S, Hasan S, Mohammadianpanah M, Razzaghi S, Nasrolahi H, Mosalaei A, et al. Malignant Neoplasms of the Anal Canal. *Ann Colorectal Res.* 2013;**1**(2):46-53.
- Jeong WK, Park JW, Choi HS, Chang HJ, Jeong SY. Transanal endoscopic microsurgery for rectal tumors: experience at Korea's National Cancer Center. *Surg Endosc.* 2009;**23**(11):2575-9.
- Mellgren A, Sirivongs P, Rothenberger DA, Madoff RD, Garcia-Aguilar J. Is local excision adequate therapy for early rectal cancer? *Dis Colon Rectum.* 2000;**43**(8):1064-71.
- Zacharakis E, Freilich S, Rekhraj S, Athanasiou T, Paraskeva P, Ziprin P, et al. Transanal endoscopic microsurgery for rectal tumors: the St. Mary's experience. *Am J Surg.* 2007;**194**(5):694-8.
- Buess G, Theiss R, Gunther M, Hutterer F, Pichlmaier H. Endoscopic surgery in the rectum. *Endoscopy.* 1985;**17**(1):31-5.
- Moore JS, Cataldo PA, Osler T, Hyman NH. Transanal endoscopic microsurgery is more effective than traditional transanal excision for resection of rectal masses. *Dis Colon Rectum.* 2008;**51**(7):1026-30.
- Zhang HW, Han XD, Wang Y, Zhang P, Jin ZM. Anorectal functional outcome after repeated transanal endoscopic microsurgery. *World J Gastroenterol.* 2012;**18**(40):5807-11.
- Duek SD, Kluger Y, Grunner S, Weinbroum AA, Khoury W. Transanal endoscopic microsurgery for the resection of submucosal and retrorectal tumors. *Surg Laparosc Endosc Percutan Tech.* 2013;**23**(1):66-8.
- Maslekar S, Pillinger SH, Monson JR. Transanal endoscopic microsurgery for carcinoma of the rectum. *Surg Endosc.* 2007;**21**(1):97-102.
- McCloud JM, Waymont N, Pahwa N, Varghese P, Richards C, Jameson JS, et al. Factors predicting early recurrence after transanal endoscopic microsurgery excision for rectal adenoma. *Colorectal Dis.* 2006;**8**(7):581-5.
- Lin GL, Meng WC, Lau PY, Qiu HZ, Yip AW. Local resection for early rectal tumours: Comparative study of transanal endoscopic microsurgery (TEM) versus posterior trans-sphincteric approach (Mason's operation). *Asian J Surg.* 2006;**29**(4):227-32.
- Arafa MA, Sallam S, Jriesat S. Colorectal cancer screening amongst first degree relatives of colon cancer cases in Jordan. *Asian Pac J Cancer Prev.* 2011;**12**(4):1007-11.
- Tsai BM, Finne CO, Nordenstam JF, Christoforidis D, Madoff RD, Mellgren A. Transanal endoscopic microsurgery resection of rectal tumors: outcomes and recommendations. *Dis Colon Rectum.* 2010;**53**(1):16-23.
- Minsky BD, Enker WE, Cohen AM, Lauwers G. Local excision and postoperative radiation therapy for rectal cancer. *Am J Clin Oncol.* 1994;**17**(5):411-6.
- Ganai S, Kanumuri P, Rao RS, Alexander AI. Local recurrence after transanal endoscopic microsurgery for rectal polyps and early cancers. *Ann Surg Oncol.* 2006;**13**(4):547-56.
- Doornebosch PG, Tollenaar RA, De Graaf EJ. Is the increasing role of Transanal Endoscopic Microsurgery in curation for T1 rectal cancer justified? A systematic review. *Acta Oncol.* 2009;**48**(3):343-53.
- Endreseth BH, Wibe A, Svinsas M, Marvik R, Myrvold HE. Postoperative morbidity and recurrence after local excision of rectal adenomas and rectal cancer by transanal endoscopic microsurgery. *Colorectal Dis.* 2005;**7**(2):133-7.
- Cocilovo C, Smith LE, Stahl T, Douglas J. Transanal endoscopic excision of rectal adenomas. *Surg Endosc.* 2003;**17**(9):1461-3.
- Leonard D, Remue C, Kartheuser A. The transanal endoscopic microsurgery procedure: standards and extended indications. *Dig Dis.* 2012;**30 Suppl 2**:85-90.
- Corman ML. *Colon and Rectal Surgery.* 5th ed New York; 2005.
- Winde G, Nottberg H, Keller R, Schmid KW, Bunte H. Surgical cure for early rectal carcinomas (T1). Transanal endoscopic microsurgery vs. anterior resection. *Dis Colon Rectum.* 1996;**39**(9):969-76.
- Kinoshita T, Kanehira E, Omura K, Tomori T, Yamada H. Transanal endoscopic microsurgery in the treatment of rectal carcinoid tumor. *Surg Endosc.* 2007;**21**(6):970-4.