Is partial thickness excision in TAMIS without defect suture safe for benign rectal lesions?

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BACKGROUND: *One of the minimally invasive methods used in the surgical treatment of large-based polypoid lesions located in the rectum is transanal minimally invasive surgery (TAMIS). This method, which relieves patients from the severe morbidities of invasive surgical procedures, is performed in both malign (T1-T2) and benign lesions. Difficulty of suturation after TAMIS emerges as the most important factor to prolong the procedure. We aimed to analyse the efficacy of TAMIS procedure with partial thickness resection without suturation.*
MATERIALS AND METHODS: *This was a retrospective study. The study was conducted in a Turkish Education and Research Hospital in 2016. Data of 10 patients who diagnosed with benign rectal masses were included in the study. Patients who were suspected for muscularis propria invasion and lymph node positivity in magnetic resonance imaging preoperatively excluded from the study. All lesions were resected with TAMIS and the mucosal defects were not closed in any patients. Demographic features, lesion's distances to anal verge, excised lesion's size, histopathological report, operation times, duration of hospital stay and complications were recorded*
RESULTS: *Six male and 4 female patients were treated. The mean distance to the anal werge of the lesions was 8.5 (5-12) cm. The longest diameters of the lesions ranged from 1-4 cm in length. All the patients were discharged the day after the surgery. Operation times were found to be 46.1 ± 5 min (30-70). Histopathological examinations of the removed lesions revealed villous adenomas in 3 patients, villous adenoma and Tis adenocarcinoma in 5 patients, villous adenoma and T1 adenocarcinoma in 1 patient and neuroendocrine tumor in 1 patient. There were no early complications such as bleeding, and late complications such as perforation, anal incontinence or anorectal dysfunction in any patient. No evidence of recurrence was found in any of the patients under control rectosigmoidoscopy and pelvic MRI examinations.*
CONCLUSION: *Partial thickness resection of rectal benign lesions by TAMIS method is safe. After resection some surgeons suggest to close the defect by suture or stapler. In our study resection without closure of the defect is found safe and feasible with limited patient prejudice.*

KEY WORDS: Rectal benign lesions, Transanal partial thickness excision

Introduction

Adenoma to carcinoma sequence (polyp to cancer) is considered as the most important mechanism in the development of rectum cancer. The excision of the polypoid lesions in rectum is essential in terms of preventing malignancies from developing in this zone. Endoscopic excision is sometimes not possible in flat, large based polyps while peduncle polyps can be easily excised with near zero complication rate. Transanal excision is usually possible in patients with broad-base polyps in rectum. Transanal endoscopic microsurgery (TEM) and transanal minimally invasive surgery (TAMIS) applications in rectosigmoid lesions with medial and superior rectum lesions that cannot be excised by the transanal route provide treatment by protecting the patients from invasive surgical procedures and more morbidity rates. TEM is a minimally invasive procedure defined by Buess

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et al for the excision of rectal lesions [1-3]. This technique involves endoscopically dissecting lesions 18-20 cm proximal from the anal verge, removing the lesions as full layer and suturing of the mucous membrane [4]. TEM has a morbidity rate of 3-10% including rectal bleeding, sutured part opening, perforation and incontinence. It is also known as a relatively expensive procedure as it requires the provision of a specially manufactured system [5,6].

TAMIS is a procedure that is used as an alternative to TEM as a method that can be applied with laparoscopic materials used in the transanal route. It is a hybrid procedure combining TEM and minimally invasive single-procedure laparoscopy. Its use in recent years is increasing day by day 7.

The positive effect of total mesorectal excision (TME) plus low anterior resection (LAR) on survival in rectal cancer is known as a proven surgical approach. In addition, TME is associated with morbidities such as incontinence, sexual dysfunction, prolonged hospitalization, prolonged return to work, and increased postoperative pain. TAMIS enables patients to be treated without the need for LAR in the treatment of large-mass lesions where the mass in the rectum is histologically benign and preoperative radiological examinations show limited invasion to the mucosa in the rectum wall and the surrounding mesenteric lymph node images are not detected. In the literature, TAMIS applications have been described as an attempt to include suture of rectal defect after excision with full thickness and clear surgical margin. One of the main difficulties of the practice is the suturation of the rectum wall after excision due to the difficulty of creating the pneumorectum and the narrowness of the working area.

In our technique of TAMIS, we preferred histopathologically benign and preoperative radiological examinations that reveal the mass is limited in mucosa on the rectum wall and large-base mass lesions without peripheral mesenteric lymph node. The lesions were excised up to muscularis propria layer without suture closure. And our hypothesis was that it can be applied as a safe method, reducing the morbidity of the procedure. In this study we reviewed the efficacy of our TAMIS application.

Materials and Methods

A descriptive study is designed. Patients who diagnosed with rectal masses that were not be able to excised and benign in endoscopic biopsy were included in the study. Pelvic dynamic magnetic resonance imaging (MRI) imaging was performed preoperatively in all patients. Patients with suspected muscularis propria invasion (T2) and lymph nodes in the surrounding mesentery in pelvic MRI evaluation were excluded from the study. ınformed consent form was obtained from all patients in all operations. In addition, digital rectal examination, whole blood count, liver function tests, coagulation tests were evaluated preoperatively in all patients. Demographic features, lesion's distances to anal verge, excised lesion's size, histopathological report, operation times, duration of hospital stay and complications were recorded. All operations were performed by the same surgeons (AK-AS). All the patients underwent rectosigmoidoscopy and pelvic MRI at 3 months after surgery.

Operative Technique

Preparation of the colon to the procedure was performed with laxative sodium phosphate, which was orally ingested the night before surgery, and rectal enema applied 1 hour before the procedure. The procedure was initiated following rectal application of the single incision laparoscopic surgery (SILS) port (covidien, USA) after administration of general endotracheal anesthesia. Then CO_2 insufflation was performed and pneumorectum was formed. In patients who could not produce pneumorectum at a level sufficient to provide adequate working space, simultaneous laparoscopy was performed and sigmoid colon was closed with a hanger material. The image was provided with a 5 mm camera installed from the SILS port. First, the lesion was bordered and 5-10 cc saline was injected into the submucosal area and the lesion floor mobilized. The muscle layer was seen and the lesion was excised at this level using hand tools and sealing energy devices used in standard laparoscopy. After hemostasis was achieved, the procedure was terminated. All operations were performed in the lithotomy position. After the procedure, the excised specimen was spread on a plate and fixed with needles so that all the edges were visible to obtain a reliable histopathological evaluation.

Results

Between January 2016 and December 2016, 10 patients were included in the study. The mean age of the patients was 61.3 (43-77). 6 male and 4 female patients were treated. The mean distance to the anal werge of the lesions was 8.5 (5-12) cm. Three patients who were not able to create pneumorectum were performed simultaneous laparoscopy and sigmoid colon suspension was applied to provide adequate space in the rectum. The longest diameters of the lesions ranged from 1-4 cm in length. All the patients were discharged the day after the surgery. Oral nutrition was started 4 hours after surgery to all patients. Intestinal reactivation was occured without any problem. Both gas outflow and defecation were observed in all patients before leaving the hospital. Operation times were found to be 46.1 ± 5 min (30-70). Preoperative pathology of the lesions was villous adenomatous high grade dysplasia in 9 patients and neu-

TABLE I

Patient	Age	Distance from anal verge (cm)	Size (cm)	Additional procedure	Histopathology
1	56	8	4x4		Villous adenoma+Tis AdenoCA
2	76	10	4x4		Villous adenoma
3	60	8	3x4	Laparoscopy hybrid	Villous adenoma +Tis AdenoCA
4	69	7	3x4		Villous adenoma +Tis AdenoCA
5	62	5	3x4		Villous adenoma +Tis AdenoCA
6	63	5	2x4		Villous adenoma
7	77	10	4x3		Villous adenoma +Tis AdenoCA
8	52	12	3x2	Laparoscopy hybrid	Villous adenoma +T1 AdenoCA
9	43	10	1x2	Laparoscopy hybrid	Neuroendocrine tm T1
10	55	10	3x2		Villous adenoma

TABLE II

Age	61,3 (43-77)
Gender M/F	6/4
Mean distance (cm)	8,5 (5-12)
Size (Longest diameter)	1-4 cm
Histopathology	
Villous adenoma	3
Villous adenoma + Tis AdenoCA	5
Villous adenoma + T1 AdenoCA	1
Neuroendocrine Tm	1
Mean operation time (min)	46,1
Mean hospital stay length	1
Mean follow-up time (month)	9,3

roendocrine tumor in 1 patient. Histopathological examinations of the removed lesions revealed villous adenomas in 3 patients, villous adenoma and Tis adenocarcinoma in 5 patients, villous adenoma and T1 adenocarcinoma in 1 patient and neuroendocrine tumor in 1 patient. There were no early complications such as bleeding, and late complications such as perforation, anal incontinence or anorectal dysfunction in any patient. The average follow-up period is 9.3 months (6-16 months). No evidence of recurrence was found in any of the patients under control rectosigmoidoscopy and pelvic MRI examinations (Table I, II). It was observed that the bowel recanalization was completely normal. During the follow-up period no patients were referred to hospital because of bowel obstruction symptoms and any rectal stricture was not detected on control rectosigmoidoscopy.

Discussion

Transanal excision of rectal broad-base polypoid lesions by using the SILS port, removes the necessity of low anterior resection procedure which has relatively high morbidity rate [8]. The excision of rectal lesions by using the SILS port was first described in 2010 by Atallah et al [9]. Lim et al have shown that this procedure is safe and feasible for advanced rectal cancers, neuroendocrine tumors, and advanced rectal cancers with complete response to neoadjuvant therapy [10]. Similarly, Gorgun et al have also applied TAMIS to patients with multiple comorbid factors who are at high risk for aggressive rectal surgery [11].

While TEM has been preferred more often in the transanal excision of rectal lesions in the past, increasing numbers of TAMIS has been applied in recent years. The need for special equipment and special training that is not available at all centers of the TEM procedure can be considered as the most important reason for this situation. However, TEM has been shown to be cost effective compared with conventional resection for rectal adenomas and early rectal cancers [12]. Using a single access port with standard laparoscopic instruments, TAMIS will be more cost effective and more accessible to many surgeons performing laparoscopic surgery. Today, with the production of single port devices specific to TAMIS applications, the method can be implemented more practically and with less complication rates [7].

In our study, the distances to the anal verge of the lesions and the diameters of the lesions were found to be similar to many studies in the literature. Ataallah et al, who first implemented the TAMIS procedure, performed this procedure in lesions ranging from 6 to 13 cm to anal verge and found lesion diameters at the range of 1.5 to 6 cm. Gorgun et al also described the distance to the anal verge as 5-12 cm, and tumor size as 1-5,4 cm in their study [13]. In the review received by Martin-Perez et al, which has extensive information on TAMIS, the distance to anal verge is specified in the range of 4-13 cm [14].

The commonly accepted approach in TAMIS applications is a full-thickness excision of the lesion.

Approximately 60% of publications reported full-thickness excision and 9% had submucosal excisions. Mixed full thickness and partial thickness excisions were reported in 24% and excision depth was not specified in 15%. Full-thickness lesion excision is generally suggested even for benign neoplasms because of the possibility that these lesions may contain an invasive component [15]. In the

treatment of rectal polypoid lesions which have benign histopathology (villous adenoma, carcinoma in situ), partial thickness excision up to the muscularis propria is sufficient. We also applied all the surgical procedures in this way. Almost all of the partial thickness TAMIS applications in the literature, indicate that the resulting defect on the rectal mucosa has been closed. Most surgeons closed the defect with primary suturation, while others used staples for this procedure [16].

Suturation can make the operation technically difficult and prolong the operation time because of the narrow working area and loss of pneumorectum during the procedure. Some surgeons close the defects by intracorporeal sutures while others do it extracorporeally with the help of knot-pushers [17,18].

All these procedures can make the applicability of the TAMIS process difficult. In our study, we did not close any of the defects that occurred after excision of the polypoid lesions with neither the suture nor the stapler. We did not find any complications on follow-up. Less number of patients, variation of location and size, short follow up time can be considered as the limitations of this study. Although our study did not involve a large number of patients, it was shown that TAMIS and partial thickness excision were safe in benign rectal lesions and it was not necessary to suture the resulting defect.

Rıassunto

PREMESSA: Uno dei metodi minimamente invasivi utilizzati nel trattamento chirurgico delle lesioni polipoidi di grandi dimensioni situate nel retto è la chirurgia transanale minimamente invasiva (TAMIS). Questo metodo, che allevia i pazienti dalle gravi morbilità conseguenti alle procedure chirurgiche invasive, viene eseguito sia in lesioni maligne (T1-T2) che benigne. La difficoltà di sutura dopo che TAMIS emerge come il motivo più importante di prolungamento dell'intervento. Abbiamo inteso analizzare l'efficacia della procedura TAMIS con resezione parziale dello spessore senza sutura.

MATERIALI E METODI: Lo studio, di tipo retrospettivo, è stato condotto in un ospedale turco di istruzione e ricerca nel 2016, includendo i dati di 10 pazienti con diagnosi di massa benigna rettale, ed escludendo quelli con sospetto di invasione della muscolare propria e di positività linfonodale all'imaging preoperatoria con risonanza magnetica. Tutte le lesioni sono state reseccate con TAMIS e la soluzione di continuo della mucosa non è stata riparata in nessuno di essi. Sono stati registrati le caratteristiche demografiche, le distanze della lesione dal bordo dell'ano, le dimensioni della lesione asportata, il referto istopatologico, la durata dell'interbento, la durata della degenza ospedaliera e le complicanze.

RISULTATI: La casistica riguarda sei uomini e 4 donne. In media la distanza dal margine anale delle lesioni era di 8,5 (5-12) cm. I diametri longitudinali maggiori delle lesioni variavano da 1-4 cm. Tutti i pazienti sono stati dimessi il giorno successivo all'intervento chirurgico. I tempi operatori sono stati registrati a 46,1 ± 5 min (30-70). Gli esami istopatologici delle lesioni rimosse hanno rivelato in 3 pazienti un adenoma villoso, adenoma villoso e adenocarcinoma Tis in 5 pazienti, adenoma villoso e adenocarcinoma T1 in 1 paziente e tumore neuroendocrino in 1 paziente. Non ci sono state complicazioni precoci come sanguinamenti nè complicazioni tardive come perforazione della parete, incontinenza anale o la disfunzione anorettale in nessun paziente. Non è stata riscontrata alcuna recidiva in nessuno dei pazienti sottoposti a controllo sigmoidoscopico nè al controllo con risonanza magnetica della pelvi.

CONCLUSIONE: La resezione parziale dello spessore delle lesioni benigne rettali mediante il metodo TAMIS è sicura. Dopo la resezione alcuni chirurghi suggeriscono di chiudere il difetto mediante sutura o cucitrice. Nello studio, numericamente limitato nella casistica, la resezione senza chiusura del difetto si è dimostrata sicura e fattibile.

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