Transanal Minimally Invasive Surgery Short- and Mid-term Outcomes

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Introduction: Transanal minimally invasive surgery (TAMIS) is a very efficient andsafe technique for the management of rectal lesions that are large or not amenable to colonoscopic removal. Both benign and malignant lesions can be excised with higher rates of specimen nonfragmentation and margin negativity. Introduced in 2010 by Atallah it has undergone tremendous growth with respect to indications and instrumentation. We present our short- and mid-term experience in this novel technique. **Materials and Methods:** A retrospective study from September 2016 (when the first TAMIS case was done in our institution) up to February 2020 was carried out. Case records were analyzed and their outpatient follow-up was traced. **Results:** A total of 20 patients had undergone TAMIS from September 2016 to February 2020. The most common indication for undergoing TAMIS was rectal adenomas in 6 (30%) patients. This was followed by rectal carcinomas *in situ* or carcinoma suspected in a previously biopsied polyp in 4 (20%) patients. Hyperplastic polyps constituted 4 (20%) of the TAMIS procedures. We also hadtwo patients with juvenile polyposis. There was no specimen fragmentation in any of the specimens. Only one patient had a positive margin and underwent low anterior resection. The final biopsy showed no residual tumor. There were noprocedure-related complications. The average hospital stay was 24 h. All procures were done under general anesthesia. Our longest follow-up is 40 months. The mean follow-up was of 16.1 months. There has been no procedure-related complication. None of our patients have recurrence. **Conclusion:** TAMIS is a safe and effective technique for the management of benign and early rectal cancer lesions of the rectum. Our short- and mid-term outcomes are encouraging to continue using this technique for our patients.

KEYWORDS: *Adenoma, tis (carcinoma in situ), transanal endoscopic microsurgery, transanal minimally invasive surgery*

INTRODUCTION

Transanal minimally surgery is a novel and eleganttechnique for the management of mid and upper rectal lesions. It provides a better visualization andcompleteness of resected margins compared to traditionalopen methods of transanal excision. First described byAtallah in 2010, it has gained rapid popularity amongcolorectal surgeons across the world.[1] A large numberof studies have been published to evaluate and extend cthe indications of this technique. Transanal minimally invasive surgery (TAMIS) results in more cases of completeness of surgical margin negativity and less fragmentation of specimens.[2]

We have been doing TAMIS since the fall of 2016.[4,5] We continue to do TAMIS till present. We present our experience and outcomes over the past 40 months.

MATERIALS AND METHODS

All patients who underwent TAMIS from September 2016 to February 2020 were included in this study. Case records were examined which extended over a period of 40 months. The author keeps a separate copy of minimally invasive transanal procedures. Outpatient records were analyzed for follow-up of the patients. Patients' follow-up was done by both clinical examination and flexible sigmoidoscopy. TAMIS was performed using both SILS port and GelPoint Path. Conventional laparoscopic instruments like L-hook with monopolar cautery and atraumatic bowel graspers were used. The technical aspects of the procedure are described elsewhere.[4,5]

RESULTS

A total of 20 patients had undergone TAMIS from September 2016 to February 2020 [Table 1]. The most common indication for undergoing TAMIS was rectal adenoma with or without dysplasia in 6 patients (30%). This was followed by rectal carcinomas *in situ* or carcinoma suspected in a previously biopsied polyp in 4 patients (20%). Hyperplastic polyps constituted4 (20%) of the TAMIS procedures. We also had 2 (10%) patients with juvenile polyposis. The average age of patients was 45.4 years, while the youngest patient was 14-year-old male and the oldest 88-year-old female [Table 2]. The average time taken to do TAMIS was 42 min from scoring of lesions till suturing of the rectal wall defect. The shortest time was 30 min with the longest 90 min. Patients who had adenomas underwent full-thickness excision with suturing of the rectal wall defect with 3-0 braided absorbable briaded suture in a running fashion.

Four patients underwent full-thickness excision after they had been diagnosed with carcinoma *in situ*. There was no specimen fragmentation and three of four had negative margins. One patient had tumor extending up to one of the resected margins. Due to her suspicion of nodal involvement, she underwent Lap low anterior resection (LAR) with coloanal pull through. Her final biopsy showedno tumor and none of the 14 lymph nodes removed had any tumor. She has completed 18 months of follow-up and her ileostomy has been reversed. She is disease free.

A 44-year-old male presented with mid rectal stricture following treatment of his prolapse by a quack whichwas done several years back. TAMIS was done – stricture was identified and a stirctureplasty was done. This patient underwent Hegar dilations twice and he has no stricture now. He has completed 28 months of follow-up.

In a 58-year-old lady with rectal bleeding, repeated biopsies were inconclusive. TAMIS was performed and her final biopsy showed mucinous adenocarcinoma.

TAMIS was also found a useful technique in a 52-year-oldmale where the internal opening was very high and could not be traced with a naked eye examination. TAMIS was used tolocate and thread the internal opening and a seton was placed. A 88-year-old lady with obstructing right colon cancer withlarge rectal adenoma was referred by our gastroenterologist. She underwent laparoscopic right hemicolectomy followed by TAMIS. Both the procedures together took 3 h to perform. She tolerated both the procedures well. She wenthome on the 5th postoperative day on a normal diet. She has completed 4 months of follow-up.

Table 1: Transanal minimally invasive surgery operations done at our institution

Diagnosis	Number of cases	Operation	Final HPE	Complications	Reoperation required
Villous adenoma	6	Full-thickness excision	Adenoma	None	No

Hyperplastic polyp	4	Submucosal excision	Tubular/adenomatous Hyperplastic polyps/ inflammatory polyps	None	None
Rectal carcinoma *in situ*/T1	4	Full-thickness excision	Carcinoma *in situ*. In one case, the margins were positive	None	In one case, LAR with coloanl pull-through was done. There was no tumor in the final biopsy. All 15 nodes were negative
Juvenile polyposis	2	Submucosal excsion	Juvenile polyposis	None	None
Solitary rectal ulcer syndrome	1	Full-thickness excision	Benign	None	None
Diagnostic biopsy to confirm cancer	1	Biopsy	Mucinous adenocarcinoma	None	Colostomy due to obstructing growth
High anal fistula	1	Seton placement	Benign	None	Cutting setons
Rectal stricture	1	Strictureplasty	Benign	None	Hegar dilations

LAR: Low anterior resection, HPE: Histo pathological examination

Table 2: Demography of transanal minimally invasive surgery patients

Parameter	Value
Average age (SD)	45.4 years (17)
Average BMI (SD)	26.5 (3.86)
Most common ASA grade	II
Average length of follow-up (SD)	16 months (16)
Average distance from the anal verge (SD)	7.4 cm (1.6)
Average time taken to perform TAMIS	42 min (15)

TAMIS: Transanal minimally invasive surgery, SD: Standard deviation, BMI: Body mass index, ASA: American Society of Anesthesiologists

Our longest follow-up is of 40 months. There has been no recurrence in our series so far.

Our smallest size of the rectal lesion was 1 cm and the largest 6 cm. Although we have done TAMIS in circumferential lesions, but most of these were scattered close to each other and a submucosal resection was done (juvenile polyposis). There were 11 males and 9 female patients in our series.

DISCUSSION

TAMIS was first done by Atallah in 2010, but he published his results in 2010.[1] Since then, it has gained rapid popularity in North America as well as outside.[6,7] A large number of studies have shown the safety and efficacy of TAMIS.[1,2,7] Its indications and contraindications are the same as that of TEM.[1] Conventionally, it has been recommended to be applied to lesions <3 cm in size and occupying <30% of the rectal circumference.[8,9] However, lesions occupying more than 40% of the rectal circumference and sleeve resections for circumferential rectal lesions have been reported with good results.[6,10] As the experience of the surgeons is increasing, the indications are being pushed further.[10] TAMIS results in less specimen fragmentation and less margin positivity.[7] We have been doing TAMIS for more than 3 years now.[4,5] Our indications have encompassed all range of rectal pathologies such as adenomas, polyps with dysplasias, hyperplastic polyps, rectal strictures, high anal fistula, and diagnostic biopsies. TAMIS is well tolerated in all age groups. Our youngest patient was 14 years old and our oldest patient was 88 years old. There has been no procedure associated with morbidity or mortality. We had no cases of specimen fragmentation or peritoneal entry. Only one patient had a margin-positive specimen in whom subsequent resection showed no residual cancer. We have not seen any recurrence in our series. We did not do any frozen sections. Margins were clearly marked and sent to pathology personally by the operating surgeon. In suspicions cases of cancer a full work up to rule out higher T stage of cancer or lymph node involvement was done. This included a pelvic magnetic resonance imaging and computed tomography scan of the chest, abdomen, and pelvis.[4,5] Patients were counseled and explained that if there was upstaging of cancer, then a full resection shall be needed. The average distance from the anal verge was 7.4 cm.

CONCLUSION

TAMIS is a safe and effective technique for the management of benign and early rectal cancer lesions of the rectum. Our mid-term outcomes are encouraging to continue using this technique for our patients.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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