



# Feasibility and advantages of transanal minimally invasive surgery: a 7-year experience with 76 cases

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**Background:** Transanal minimally invasive surgery (TAMIS) is appropriate for benign lesions that are not suitable to flexible endoscopic excision, and it can be a valuable option for malignant rectal disease, in carefully selected patients. The authors report their 7-year experience with TAMIS for treatment of rectal tumours.

**Methods:** From May 2010 to May 2017, 76 patients underwent local excision of rectal lesions by a TAMIS approach.

**Results:** Between May 2010 and May 2017, 76 patients were treated with the TAMIS approach. Of these 58% were male and 42% were female. The average age was 68 years and the average distance from the anal verge was 6 cm. The postoperative pathology reported low grade rectal adenoma (22%), high grade rectal adenoma (20%), rectal adenocarcinoma (54%) and benign rectal lesion (4%). Twenty-two patients have had a neoadjuvant chemoradiotherapy. At mean follow-up of 48 months (range, 1–83 months) no fecal incontinence or other anorectal dysfunction. Local recurrence was observed in 3 patients (2 malignant, 1 benign).

**Conclusions:** In this study, TAMIS confirmed to be a safety and feasible treatment option for precancerous polyps and early-stage rectal cancers with favorable histology.

**Keywords:** Transanal minimally invasive surgery (TAMIS); rectal tumor; local excision

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## Introduction

Atallah *et al.* (1) in 2010 coined the term transanal minimally invasive surgery (TAMIS) to describe a surgical technique for local excision of rectal tumours (1-8), using a single-port device adapted for transanal insertion, the dissection being performed by standard laparoscopic instruments. Gradually, TAMIS has achieved an ample propagation, principally in colorectal surgical unit with a high level of experience in minimally invasive surgery.

This approach is chosen for benign lesions that are not doable to flexible endoscopic removal (9,10), and it can be a valuable option for malignant rectal disease. As for transanal endoscopic microsurgery (TEM), TAMIS offers, in carefully selected patients, an adequate balance between oncological outcome and minimal postoperative morbidity, with finer functional result compared to typical rectal resection.

The authors report their 7-year practice with TAMIS for treatment of rectal tumours.

## Methods

From May 2010 to May 2017, 76 patients underwent local excision of rectal tumors by a TAMIS approach. All patients with a malignant tumour underwent a complete preoperative staging comprising clinical examination, full colonoscopy with biopsy, rigid rectoscopy, endorectal ultrasound, pelvic MRI and whole body multislice CT scan. In patients with large and histologically prove benign tumours MRI was not routinely performed. A TAMIS approach was indicated in case of: T1 tumours mobile, favorable histology (no LV invasion on biopsy), node negative on ultrasound/MRI, height of lesion <12 cm from the anal verge, tumors involving less <40% of the rectal circumference, lesions smaller than 4 cm. Tamis was also used to perform palliative local excision in patients unfit for a radical abdominal operation or rejected a stoma.

Full mechanical bowel preparation was performed in all patients the day before surgery. Antibiotic prophylaxis was administered at anesthetic induction; prophylaxis for venous thrombosis was also given. An intravenous bolus of butyl scopolamine at a dose of 20 mg was habitually administered to decrease bowel spasms and fluctuation induced by gas insufflation into the rectum. Patient positioning on the operating table room was chosen on the basis of anatomic position of the lesion. Even if this is not absolutely required in the TAMIS procedure because of the ample range of movement permitted by the conventional laparoscopic camera and instruments, mostly it was considered useful to have the lesion positioned in the inferior part of the operative field. Thus, in case of posterior tumors, patients were positioned in lithotomy position; for anterior lesions patients were positioned in prone jack-knife or lateral position.

Surgery was performed under general anesthesia on all occasions; epidural or spinal anesthesia described by other authors was never approached (11). Patients were operated using the SILS port (®Medtronic) with a 30 degree 5 mm laparoscopic optic and standard laparoscopic instruments. All resections were effected under 15–20 mmHg CO<sub>2</sub> pressure at an insufflation rate of 20 L/min. Resection specimens were pinned on a cork plate and sent fresh for histopathological examination. In the postoperative period, the patients were allowed to sit and walk as soon as the anesthesia wears off. The patient is allowed to eat a regular diet immediately after surgery and is monitored for at least 24 hours in the hospital

contest before discharge.

Data were prospectively collected into a dedicated database. Complications were graded according to Dindo *et al.* (12).

## Results

Between May 2010 and May 2017, 76 patients were treated with the TAMIS technique. Of these 58% were male and 42% were female. The average age was 68 years (range, 18–97 years) and the average distance from the anal verge was 6 cm (range, 4–12 cm).

All procedures were concluded by TAMIS approach. Intraoperative complications occurred in 5 patients (6%). Bleeding was noted in 1 patient and was favorably treated by coagulation and fibrin glue. In 3 patients (4%), the abdominal cavity was entered and the defects were closed by combined transanal and laparoscopic sutures; in 1 patient (1%) there was a rectovaginal fistula for an anterior wall lesions. In one patient of them, a Hartmann procedure was considered necessary at two postoperative day; a diverting colostomy was performed at the 5th postoperative day in the patient with the rectovaginal fistula.

The postoperative pathology reported low grade rectal adenoma (22%, n=17), high grade rectal adenoma (20%, n=15), rectal adenocarcinoma (54%, n=41) and benign rectal lesion [4%, n=3 (1 lipoma, 1 mucinous cystadenoma, 1 low grade GIST)]. Out of these, 22 patients have had a neoadjuvant chemoradiotherapy (10 Tx and TRG1), 5 were operated on for uncomplete endoscopic rectal polypectomy (5 Tx). In 6 cases, the histopathological report showed involved margins: 5 patients of them underwent to a salvage surgery with a total mesorectal excision (TME), the other patient was unfit for radical surgery but is actually alive and well. The salvage surgery was also performed for patients having a pT greater than 2 (two cases) and for a TRG greater than 2 (two cases). The median operation time was 69 minutes (range, 40–140 minutes). There was one perioperative mortality and median postoperative stay was 2 days (range, 1–9 days).

At mean follow-up of 48 months (range, 1–83 months) no fecal incontinence or other anorectal dysfunction. Local recurrence was observed in 3 patients (2 malignant, 1 benign).

## Conclusions

Transanal excision is an interest organ-sparing procedure

to rectal tumor located in middle and upper rectum. Advantages over major pelvic comprise less distress, a faster recovery, and the abstention of permanent fecal diversion.

In past years, TAMIS has become more popular, and several other studies have been published, confirming safe and effective results for rectal lesion carefully selected, with a short learning curve for laparoscopic surgeons already competent in single-port procedures (13,14).

A single-incision laparoscopic access port is utilized to provide the pneumorectum and precise dissection with complete removal of rectal neoplasms, both benign and, in selected cases, malignant (1,9,10). Patient selection is pivotal and prudence should be provided in including patients out of the indications. Indications to local excision of rectal lesions are many times debated, for clinical complete response after neoadjuvant treatment, it is important investigate the role of local excision within clinical trials.

In higher lesions placed on the anterior rectal wall, there is a raised risk of entering the peritoneal cavity, which happened in 3 patients in the present study. It is often inevitable when a full thickness resection on the anterior rectal wall is performed (12).

Closure of the defect is otherwise laborious and technically challenging and often account for the greater part of the procedure (5,9). An incorrect suturing may also lead to rectal stricture and therefore also no closure can be considered, without a significative rise of postoperative complications (15). When feasible, closure of the defect is appropriate and it can be performed by interrupted or running stitches (with barbed suture also) or even by absorbable clips (Hem-o-lock Weck). In this study, TAMIS confirmed to be a safety and feasible treatment option for precancerous polyps and early-stage rectal cancers with favorable histology (9,10,14,16-18).

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