



Transanal surgery: today's and future applications

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During the last decades, transanal surgery techniques have largely evolved. Before 1983, transanal excision (TAE) using a Parks retractor was the gold standard for benign or early-staged rectal lesions. With the concern of improving exposure and visibility inside the rectal lumen, Buess (1) described the transanal endoscopic microsurgery (TEM) allowing a high quality local excision with better outcomes in R0 resection and lower local recurrence rate (2). However, because of a steep learning curve and the need of expensive instruments not commonly available, this technique was not routinely adopted. Transanal minimally invasive surgery (TAMIS) was introduced by Atallah *et al.* (3) in 2009. This novel technique was developed as an hybrid between TEM and single-port laparoscopy. It is performed using any multichannel port transanally with traditional laparoscopic instruments, laparoscopic camera and CO₂ insufflators. Therefore, the platform is already available in most of the hospitals making this approach a cost-effective alternative. Applications of this technique first included local excision of benign rectal neoplasms and well-selected, favorable T1 cancers. More recently, it has also been described for recto-urethral fistulae repair, distal rectal mobilization and extraction of rectal foreign bodies (4). Nowadays, the main concern remains the oncological outcome and long-term results. Though a lot of studies compared TEM to TAE or to radical intra-abdominal approach, there is no comparative or randomized controlled study comparing TEM to TAMIS.

In this issue, Quaresima *et al.* (5) reported their experience using TAMIS for the treatment of mid and high rectal tumors. Thirty-one patients were successfully operated with an R0 resection in 97%. They used the SILS PORT (Covidien, Medtronic) platform in 19 cases and

the GelPOINT® Path (Applied Medical Corp.) platform in 12 cases. They had 8 complications (9.6%) including 5 peritoneum perforations during surgery, which could be sutured intraoperatively without requiring a conversion to a transabdominal procedure. Those excellent data are comparable to the current literature.

The article by Quaresima *et al.* deals with several important questions regarding TAMIS for rectal tumors. First, the ideal height of the lesions. According to the literature the average distance from the anal verge is 7.6 cm \pm 3–15 (6). TEM and TAMIS allow treating higher lesions than conventional excision (TAE), but are also related to the complication of entering the peritoneal cavity. This was more frequent with TAMIS than TEM/TAE and was dependent on the height (>13 cm) and size (>4.5 cm) of the lesion in a recent review (7). For lesions lower than 4 cm from the anal verge the dissection can be started by TAE and then completed by TAMIS.

Second, the excision of rectal tumors in (to with) clear safety margins are the main goals of TAMIS. The literature reports R0 resections in 95% and fragmentation of the specimens less than 5% (6,8). The herein presented study had similar good outcomes. Piecemeal resections should be avoided as they do not allow for correct interpretation of the tumor location (Haggitt or sm1–3 levels) in case of cancer, and thus compromising an oncologic adequate resection. TAMIS seems to obtain higher quality of specimen and less fragmentation compared with conventional piecemeal endoscopic mucosal resection.

So far, the only study comparing TEM versus TAMIS was performed on pelvitrainer model (9). Ten surgeons with no experience in transanal surgery had to perform a rectal local excision with both instruments with the aim of

assessing dissection and suture difficulty as well as visibility. With TEM, surgeons were faster to dissect and suture than with TAMIS. Suturing was even considered impossible in 30% of the TAMIS cases, which brings us to another questioning: should the rectal defect be closed? Suturing in the TAMIS procedure is more challenging because the space is narrow and lead to conflicts between the instruments. In a previous publication (8) comparing patients undergoing suture of the rectum or left-open technique, authors failed to demonstrate differences in morbidity and incontinence rates. Indeed, TEM has been associated with short-term anal dysfunction (10). Moreover, Herman *et al.* (11) showed that 21% of the patients had persisting fecal soiling even 6 months after surgery. During the TAMIS procedure, the sphincter is supposed to be spared by the soft transanal access platform, thus avoiding impaired functional outcome postoperatively.

Finally, the versatility of TAMIS allowing for an *en bloc* resection pushed the surgeons to perform more complex surgery including total mesorectal excision (TME) (12). Also called the “*bottom-up*” or “*down-to-up*” approach, transanal-TME (TaTME) is particularly interesting in difficult pelvic anatomy like in obese male patients with narrow pelvis. TEM and TAMIS are both suitable for TaTME. Because of the geometric design of the TAMIS platform, this latter is preferred (6). Several series and case report already demonstrate its feasibility (6). It facilitates distal rectal mobilization and thus improves distal margin results. It also allows better pelvic nerve preservation and banished the stapler problems. However, because it gave us a new view of the pelvic anatomy, some new complications (e.g., urethral injury) appeared. Penna *et al.* (13) showed in a survey that TaTME requires a substantial experience in laparoscopic TME and ideally TAMIS. Overall, TAMIS is gaining more and more popularity. However, indications should be carefully considered and patient’s selection especially for rectal cancer is crucial. More quality research is needed to strengthen the scientific proof of TAMIS long-term results.

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