REV ARGENT COLOPROCT | 2021 | VOL. 32, N° 3
DOI: 10.46768/racp.v32i03.75

Transanal Minimally Invasive Surgery (Tamis). An Alternative for Resection of a Rectal Scar After Incomplete Endoscopic Excision.

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ABSTRACT

Transanal minimally invasive resection has improved the results of classic transanal resections. These techniques have spread in recent years due to the development of TAMIS (transanal minimally invasive surgery), which consists of a transanal multichannel port through which classic laparoscopic instruments are introduced. Due to this, not only the number of transanal procedures performed has increased, but also their indications, including a wide range of conditions.

In this publication we highlight its role as a minimally invasive procedure for the excision of an insufficiently resected rectal adenocarcinoma after an endoscopic procedure, allowing an adequate study of the lesion. The main details of the technique and its results will be described.

Keywords: *Transanal Surgery; Tamis; Colorectal Polyps*

INTRODUCTION

The balance to achieve adequate treatment and maintain quality of life has led to the development of new techniques and technologies. Transanal techniques combined with the endoscopic approach appear as an alternative to conventional local resection.[1]

In 1988, Buess, et al.[2] described transanal endoscopic microsurgery (TEM) as an example of natural orifice surgery and later transanal endoscopic operation (TEO) emerged. These techniques made it possible to improve the visibility and quality of the resection, as well as to treat lesions in all parts of the rectum and distal sigmoid, with better results than conventional transanal surgery.[3]

TAMIS (transanal minimally invasive surgery) arises from the development of single port minimally invasive surgery. Described in 2010 by Atallah, et al.[4] as an alternative to TEM / TEO, it consists of the use of a single transanal multichannel port combined with the use of laparoscopic instruments.[5] This has facilitated its development and expanded the indications for transanal resectable lesions including benign lesions, particularly polyps,[6,7] neuroendocrine tumors,[7] gastrointestinal stromal tumors (GIST)[1], curative resection of T1 rectal adenocarcinomas (usually involving ¼ circumference, well differentiated, without lymphovascular invasion);[1,6,7] resection of T2 tumors (controversial indication since there is a risk of lymph node metastases; it can be considered in T2 well differentiated tumors without lymphovascular invasion, although in these cases the evidence strongly recommends the need for adjuvant chemoradiation),[1,6,7] non-oncological resections in patients with high surgical risk or by own choice and excision biopsy of the rectal scar after neoadjuvant treatment.[1] Less frequently, has been described for the repair of rectoureteral fistulas, hemostasis of a rectal Dielafoy lesion, repair of colorectal or ileorectal suture dehiscence, removal of foreign bodies, and trans-colostomy approaches.[9]

In the case reported here we highlight its role as an adjunct to endoscopic excision in the face of incomplete resections (superficial, fragmented or with compromised margins).

CASE REPORT

A 68-year-old female underwent colonoscopy resection of a sessile rectal polyp at 7 cm from the anal margin (Fig. 1). The histological report informed rectal adenocarcinoma with 4 mm depth of submucosal invasion and compromised resection margins. To complete the oncological assessment of the mesorectum, a nuclear magnetic resonance of the rectum was performed (Fig. 2), which ruled out mesorectal lymph node involvement, as well as referred to an alteration of the rectal wall, probably linked to a scar. The evaluation of distant lesions was carried out with tomography of the thorax, abdomen and pelvis and tumor markers, which were normal. The cTNM staging was T1N0M0, therefore total wall thickness resection by TAMIS was decided for a complete study of the lesion.

The authors declare the absence of conflicts of interest.

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Received: *September 2020.* ***Accepted:*** *May 2021.*

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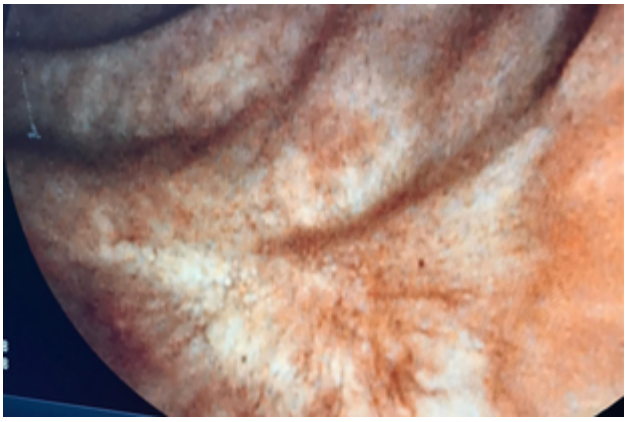

Figure 1: Endoscopy showing the pearlescent rectal scar with convergent fibrosis.

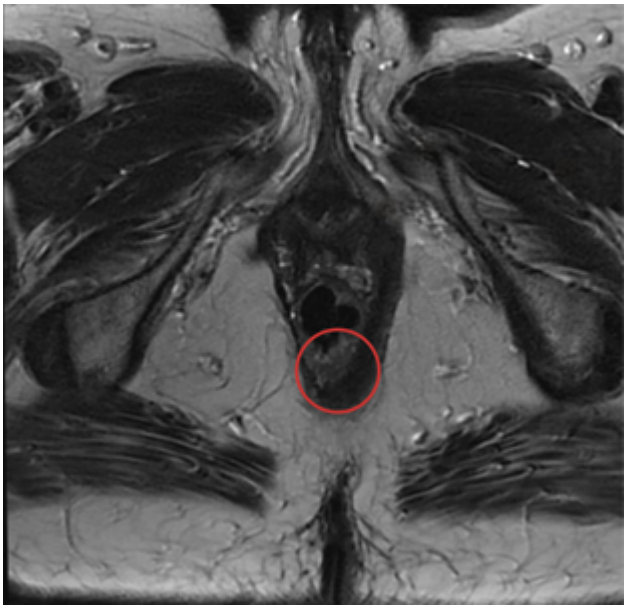

Figure 2: Nuclear magnetic resonance imaging showing mucosal thickening predominantly on the left posterolateral aspect.

An endorectal ultrasound was not done, since we do not have permanent availability of this study.

The procedure was performed under general anesthesia, with retrograde preparation of the rectum for the correct visualization of the lesion and antibiotic prophylaxis with Ampicillin-Sulbactam. The patient was placed in the gynecological and Trendelenburg position optimizing the vision of the rectal lumen. The monitor was positioned towards the patient's head, the surgeon between the legs on the right, and the assistant on the left. Rectal examination showed no lesions. Sphincter tone was normal. Gentle anal dilation was performed to facilitate device placement and decrease the risk of sphincteric trauma. Introduction and fixation of the lubricated GelPOINT Path® to the skin, for prevention of rotation/expulsion, and to minimize trauma to the anal canal (Fig. 3). Placement of the hermetic gel cap, and the three access ports.

Figure 3: Placement of the platform and start of TAMIS.

The optic was placed through the central port and laparoscopic instruments were placed through the other two. The insufflator was connected to the uppermost trocar to prevent the CO2 flow from "splashing" the optic with the liquid accumulated in the declining part of the rectum. Connection of the GelPOINT Path® to a gas stabilization bag to maintain a stable cavity. Pneumorectum at 12 mmHg. Identification of the polypectomy scar sited on the left posterolateral rectal aspect at 7 cm from the anal margin. Enhancement of the lesion with methylene blue (Fig. 4). Circumferential marking of the scar with electrocautery (margin of 1 cm). Resection began at hour 6, advancing on both sides to the proximal sector. This maneuver facilitates the dissection of the margin in depth. The specimen was taken through healthy mucosa to avoid fragmentation, ensuring a single piece with an adequate margin (Fig. 5). Removal of the lesion by removing the cap from the device. Closure of the rectal gap with a 3-0 barbed suture (V-LocTM, Covidien, Mansfield, MA) (Fig. 6). The specimen was sent oriented for hystopathological study (Fig. 7).

Postoperative period without incidents. Discharge on the same operative day. Pathological report: inflammatory scar without malignancy.

DISCUSSION

Compared to TEM / TEO, the TAMIS approach has presented certain advantages such as lower cost, easier to place platform, use of laparoscopic instruments, 360º visual field (vs. 220º of TEM), it does not require changes in the patient's position (with the possibility of a combined intraperitoneal approach) and short learning curve for skilled laparoscopic surgeons.[1,3-5,8]

There is currently renewed interest in TAMIS due to the development of transanal total mesorectal excision (taTME) combined with intra-abdominal laparoscopic

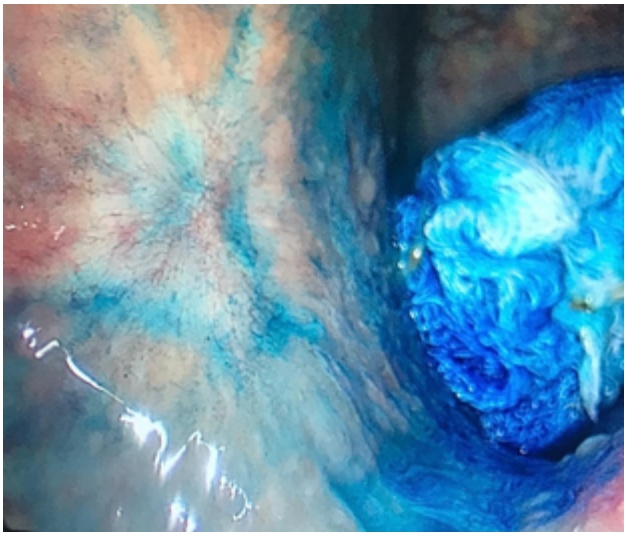

Figure 4: Enhancement of the lesion with methylene blue.

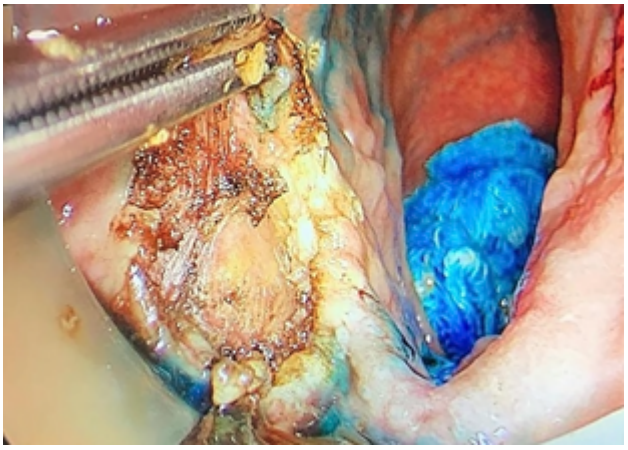

Figure 5: Beginning of dissection.

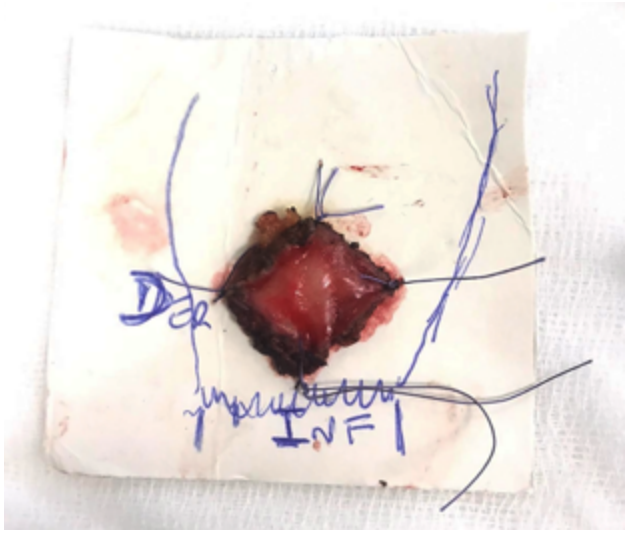

Figure 6: Complete resection. Marking and orientation of the specimen for histopathology.

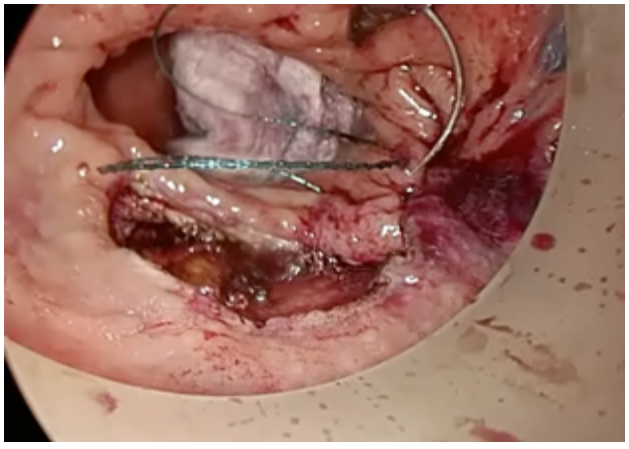

Figure 7: Closure of the rectal gap with a 3-0 barbed suture.

resection that facilitates difficult, complete excision of the mesorectum by the exclusive abdominal approach.[8,10] In this publication, we report also its value in the resection of rectal scars after incomplete endoscopic procedures.

For TAMIS, the two most widely used platforms are: SILS port® (Covidien, Mansfield, Massachusetts, USA) and GelPoint Path® (Applied Medical, Rancho Santa Margarita, California, USA).[6] Its flexible elastomer-based thermoplastic material allows adjustment of laparoscopic instruments of different sizes. It adapts to the anal canal reducing sphincter distension and thanks to the manufacturing material generates a sealing system that minimizes the loss of CO2. The shorter length compared to TEM allows for greater angulation and movement of the instruments during the procedure.[4,9] One of the technical difficulties related to TAMIS is the instability of the pneumorectum due to the pulsatile flow of the insufflator. In recent years, devices such as the AirsealTM insufflator and stabilizing gas bags, like the one we have used, have been developed. This creates a stable pneumorectum, avoiding rhythmic flow and collapse of the rectal lumen, facilitating the procedure.[11] The pneumorectum is usually performed at 15 mmHg with high flow, to achieve adequate distention.[8]

For resection with adequate margins, we highlight the usefulness of enhancing the lesion with vital staining such as methylene blue.[12] This allows better differentiation of the pathological area from the normal mucosa, facilitating the marking of the lesion with a safe margin of 5-10 mm.[3] The depth of the resection will depend on the type of lesion. In anterior full wall thickness resections, care must be taken not to injure the vagina or urethra / prostate. The use of electrocautery is preferable to visualize the dissection planes, although other methods of hemostasis can be used. The specimen obtained must be in a single piece and appropriately marked for its histopathological study.[8]

A controversial issue is the closure of the rectal gap at the extraperitoneal level. The latest publications recom-

mend that it should be attempted whenever possible.[8] For experienced surgeons and in high-volume centers there is a tendency to perform parietal closure. A 2-0 or 3-0 barbed suture can be used to facilitate the maneuver.[3] As advantages, there would be fewer complications, mainly hemorrhagic, and a faster closure. However, this is not fully proven and closure can be difficult.[8]

In terms of results, TAMIS has similar results to other endoscopic techniques of transanal surgery.[1,10] The percentages of incomplete or fragmented specimens vary according to the different series, but are better compared to traditional local resection.

Greater R0 resection margins are reported (88-90% vs. 55% in traditional local resection), less fragmentation (1.4% vs. 24%) and less accumulated local recurrence (4-6% to 20% vs. 29%).[1,3,4]

Global morbidity with transanal endoscopic resections varies between 7% and 31% in different reports.[3] This variability depends on the criteria used for its evaluation. Fortunately, more than half are mild and do not require treatment.[3,8] Among the most relevant complications, we highlight bleeding and incontinence. Bleeding is the most frequent complication (1-13%) and is associated with leaving the rectal gap open. It is usually mild and ceases spontaneously. Regarding incontinence, an incidence of 10% of variable degree has been reported. It is mainly caused by anal dilation and placement of the platform.[9] However, recent studies have mainly shown manometric alterations, without clinical expression, for both TEM and TAMIS.[5]

Suture dehiscence and perirectal abscesses are observed in 5% of cases and increase in patients undergoing neoadjuvant treatment. Urethral / vaginal injuries are seen in 5.8%.[3] Intraperitoneal perforation in high resections can be repaired by simultaneous transanal or laparoscopic abdominal approach.[3] Other rare complications include: anal stenosis, rectovaginal fistulas, vascular and nervous injuries, air embolism, neumoretroperitoneum, acute urinary retention, pain, and fever.[9]

CONCLUSION

Thanks to the accessibility and familiarity of laparoscopy for the surgeon, TAMIS has allowed the application of endoscopic procedures through the transanal approach, with a better quality of resection than the conventional transanal technique. This makes it possible to broaden the indications, as in this case in which it was used for the resection of the scar after the incomplete endoscopic excision of a rectal polyp, allowing a complete histopathological study and defining the therapeutic management.

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COMMENT

The case reports about a TAMIS procedure for resection of a scar, sequel of incomplete endoscopic excision of a lower rectum adenocarcinoma with 4 mm depth of submucosal invasion and compromised resection margins. The degree of tumor differentiation or whether there is lymphovascular invasion or budding is not reported. Although it can be assumed that it is due to its absence, the pathologist should be required to make it explicit in his report, since these are other histological factors that allow defining an early carcinoma as low or high risk of presenting residual tumor in the wall

DOI: 10.46768/racp.v32i03.75

or positive mesorectal nodes after local excision. However, in this case at least two high-risk factors were already present (compromised resection margin and tumor invasion depth >1 mm in a sessile polyp).[1,2]

The authors should be congratulated for performing the local resection successfully and without complications, obtaining a complete and unfragmented specimen for histopathological analysis and demonstrating their expertise and experience with the technique. However, it was not necessary to perform this resection if we take into account that the endoscopic biopsy report already indicated the need for an oncological resection, not only because of the compromised margins which, if were the only adverse factor, could have been corrected with the resection by TAMIS, but essentially because the depth of submucosal invasion of 4 mm defines a lesion as high risk. There is consensus that T1 carcinomas with high-risk histological factors have high rates of locoregional recurrence, similar to those of T2.[3]

Depending on the presence or absence of risk factors, early cancers have a positive mesorectal node rate of 3% to 23%, which is also higher in those located in the distal third of the rectum.[4] These positive lymph nodes can be responsible for recurrence after local resection with free margins. Unfortunately, high-resolution magnetic resonance imaging (MRI) and endorectal ultrasound (ERUS), superior to MRI for T staging, cannot be relied upon to predict lymph node involvement, because the ability of both methods for N staging is low. This is probably due to the fact that in malignant polyps (T1) the metastatic lymph nodes are usually smaller (median 3.3 mm) than in more advanced tumors (T2: 6.2 mm; T3: 8.0 mm) and additionally, when involved, cancer foci are smaller (median 0.3 mm), which makes their identification difficult.[5] Thus, although the guidelines of the Association of Coloproctology of Great Britain and Ireland recommend performing ERUS in all polypoid rectal tumors before local resection for T staging, they also state that this study or high-resolution MRI should not be relied upon to assess the likelihood of lymph node involvement.[2]

In this patient, without comorbidities, the evidence indicates radical surgery, even more so when sphincter preservation can be performed a priori, because despite the fact that the pathological report of TAMIS resection did not show residual lesion in the rectal wall, metastatic mesorectal nodes cannot be ruled out. Fortunately, and contrary to what might be assumed, previous local resection does not negatively affect the performance of an early radical proctectomy, nor does it produce adverse oncological consequences.[6]

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