Transanal Total Mesorectal Excision - A Case Report

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Rezumat

Excizia totală a mezorectului prin abord transanal - o prezentare de caz

Excizia totală a mezorectului prin abord transanal (TaTME) este o noțiune introdusă pentru prima dată în 2010 și reprezintă o abordare relativ nouă în cadrul tratamentului chirurgical al cancerului colorectal. Prezentăm cazul unei paciente în vârstă de 65 de ani, diagnosticată cu adenocarcinom moderat diferențiat de rect mediu, cT2N0M0, la care s-a practicat o rezecție totală de mezorect prin abord transanal (TaTME). Tehnica chirurgicală și posibilele dificultăți asociate sunt prezentate, inclusiv potențiale complicații postoperatorii și problemele de siguranță oncologică. TaTME reprezintă o opțiune sigură și fezabilă în tratamentul cancerului colorectal. Sunt necesare studii suplimentare pentru a confirma superioritatea metodei față de excizia totală a mezorectului prin abord laparoscopic.

Cuvinte cheie: excizia totală a mezorectului prin abord transanal, TaTME, cancer rectal, excizia totală a mezorectului

Abstract

Transanal total mesorectal excision (TaTME), first introduced in 2010, represents a relatively new approach in the surgical treatment of rectal cancer. A case of a 65-years-old patient diagnosed with moderately differentiated adenocarcinoma of the

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middle rectum (cT2N0M0) is presented. Taking into consideration patient's characteristics and tumour features, the surgical team decided to use transanal total mesorectal excision technique. The surgical technique, as well as potential postoperative complications and oncological issues are discussed in the article. Patient selection and extensive experience in minimally invasive colorectal surgery are the bases for an optimal technique implementation. Although further studies are required in order to confirm its superiority over the laparoscopic total mesorectal excision, TaTME seems to be a safe and feasible option in the surgical approach of rectal cancer.

Key words: transanal total mesorectal excision, TaTME, rectal cancer, total mesorectal excision

Background

Transanal total mesorectal excision (TaTME) represents a novel surgical technique that became an option in the surgical approach of rectal cancer. First introduced in 2010 (1), it overcomes some of the technical and anatomical challenges encountered by laparoscopy. Ma et al. showed no differences between TaTME and laparoscopic total mesorectal excision (LaTME) in terms of oncological outcomes (harvested lymph nodes, distal resection margin and positive distal resection margins), with comparable postoperative outcomes (2). Evaluating patient-quality of life and functional outcome at 6 months, Koedam et al. reported similar results to conventional laparoscopic rectal low anterior resection (3).

Case Presentation

A 65 years old female patient, with no previous medical history, was admitted for left lower quadrant pain and hematochezia. Clinical examination revealed tenderness at palpation in the left iliac fossa without any signs of peritoneal irritation. Digital rectal examination revealed a supple rectal ampulla with feces and fresh blood on the examiner's finger. A colonoscopy was subsequently performed, which showed a circumferential bleeding tumour with approximately 5 cm diameter, at 7 cm from the anal verge. The histopathological examination of the biopsy revealed moderately differentiated adenocarcinoma. The CT scan showed no secondary dissemination or intra-

abdominal adenopathy with a maximum tumor width of 14 mm without invading the serosa, cT2N0M0. After assessing the case with the tumor board, a therapeutic plan was made, surgery being the first step. Taking into consideration the patient's characteristics and the tumor features, the surgical team decided to use the transanal total mesorectal excision technique.

Preoperatively, after informed consent, the patient had stoma therapy consultation and potential stoma sites were marked. Bowel preparation consisted in osmotic laxative (macrogol) and enema, one day prior to surgery. Preoperative antibiotic prophylaxis was given one hour before the skin incision and subcutaneous low-molecular-weight heparin was administered during the whole perioperative period. The procedure took place on April 4th 2019. To our knowledge, this is the first report of a transanal total mesorectal excision (TaTME) in Romania.

A two team/Cecil approach was used, as it was considered easier, faster and safer (4). The abdominal team did not require any special equipment; an advanced energy device was used to ensure a proper, bloodless dissection (Ligasure, Medtronic, Minneapolis, MN, USA). The instrument set, monitor, scope and insufflator that were used by the transanal team were conventional. A flexible single port platform (Gelpoint Path Transanal Access, Applied Medical Inc. Rancho Santa Margarita, CA, USA), bipolar forceps and monopolar hook were also employed during the intervention.

The patient was placed in a modified

lithotomy position and in 30° Trendelenburg inclination with the right arm tucked at his side. A urinary catheter and a nasogastric tube were placed. Prior prepping the abdominoperineal surgical field, a rectal enema with diluted iodine solution was done.

Surgical Technique

Abdominal Phase

Pneumoperitoneum was achieved with a Verres needle supraumbilically, after that a 12 mm port was subsequently inserted in order to inspect the abdominal cavity. The other three 5 mm trocars were positioned as follows: in the left, right flank and right iliac fossa. The distal sigmoid was temporarily clamped, in order to facilitate the execution, by the transanal team, of the purse string suture that would close the rectal lumen.

Medial to lateral approach was used, considering the oncological advantages. Inferior mesenteric artery was ligated one cm from its origin after accurately identification of the left ureter. The inferior mesenteric vein was ligated at the inferior margin of the pancreas. After that, dissection continued laterally until the Told II fascia was sectioned. Splenic flexure mobilization was not required.

Transanal Phase

Anal dilatation was performed to ensure an atraumatic introduction of the transanal

flexible single port platform (Gelpoint Path Transanal Access, Applied Medical Inc. Rancho Santa Margarita, CA, USA). The trocars were inserted in a wide inverted triangle shape with the scope positioned inferiorly. When the distal sigmoid was clamped, the pneumorectum was initiated with a pressure of 15 mmHg. Transanal pressure must be higher than the abdominal pressure to ensure a good distention (4). Then a purse-string closure of the rectal lumen was performed with a 0 polypropylene suture at 2 cm distal from the tumor, starting from the anterior wall clockwise (*Fig. 1*). It has the role to maintain the pneumorectum and to avoid tumor contamination/spillage, but it is recommended to keep the same distance from the device the entire circumference and to mind including the surrounding structures, as the vagina, in the suture (4). A tattoo line done with the electric hook marked the dissection plane, subsequently full thickness and perpendicular incision of the rectal wall was performed circumferentially (*Fig. 2*). The dissection went down-to-up in the “holy plane”, avoiding a cone shape dissection that would not ensure a total mesorectum excision. While the anterior and posterior planes were easily identified, the lateral planes were developed by completing the dissection on the imaginary lines that joined the anterior and posterior planes. In order to ensure optimal tissue exposure, the specimen was pushed into the abdominal cavity. A secondary purse-string was placed on the free edge of the distal rectal stump before the

Figure 1. (A) transanal view of the tumor, (B) final aspect of purse-string

Figure 2. (A) tattoo lining of the dissection plane, (B) the rectal wall transection

Figure 3. (A) posterior plane of TME, (B) secondary purse-string made on the free edge of the distal rectal stump

“rendez-vous” with the abdominal team. This was used to tie it to the stapler rod when the anastomosis was performed (*Fig. 3*).

The “rendez-vous” was obtained and both teams worked to completely free the rectum and sigmoid. The specimen was extracted transanally.

Anastomosis

A stapled side-to-end anastomosis was performed using a 32 mm circular stapler (Circular stapler WH-Y-32, Stapleline GmbH, Bochum, North Rhine-Westphalia, Germany). The transanal team inserted the anvil laterally in the proximal stump, closing the free margins with a linear stapler. The staple lines were reinforced with interrupted polydioxanone 3.0 sutures and the proximal stump was reintroduced in the abdomen. The purse-string placed on the free edge of the distal rectal stump

was tied on the stapler rod. The anvil and the rod were connected, ensuring there was no tension or twisting and the stapler fired. No additional sutures were needed. After haemostasis was achieved, a drain was placed in the pelvis and a diverting ileostomy performed.

The postoperative evolution was uneventful and the patient was discharged after 6 days.

Discussion

TaTME is a relatively new technique that had already become a valid option in the treatment of colorectal cancer. The first report on short-term outcomes on a study group of 20 patients was reported in 2013 (5). When compared with the laparoscopic and the robotic approaches, there are no significant differences regarding intraoperative morbidity, conversion rate, grade III/IV morbidity, reoperation, anastomotic leak,

nodes retrieved, involved distal margin, 5-year overall survival, and locoregional recurrence. The difference appears in the resection of the mesorectum: the laparoscopic approach resulted in higher rates of incomplete mesorectal excisions compared with the open approach as well as in higher rates of involved circumferential margins compared with the transanal approach (6). However, the oncological impact remains under scrutiny (7) taking into consideration the advantages of TaTME in terms of the total excision of mesorectum over the laparoscopic approach (8). A careful selection of the patients and the surgical team experience in minimal invasive colorectal surgery (9-11) are the basis for an optimal technique implementation.

In terms of intraoperative accidents, the TaTME surgeon needs to take into consideration the risk of urethral injuries, the most severe procedure-specific morbidity. There is also a significant risk of inadvertent mobilization of the prostate as well as injury of the posterior vaginal wall and the pelvic autonomic nerves (branches of the inferior hypogastric plexus) (12).

The patients need to be carefully selected for TaTME. The best candidates for this approach are patients with distal rectal tumors (7), as well as those in which the abdominal approach is considered challenging. Additional CT/MRI pelvimetry improves the selection, as it offers a better understanding of the pelvic anatomy (13). Factors favouring the TaTME approach are: male gender, locally advanced rectal cancer, tumours in the distal third of rectum, narrow and/or deep pelvis, visceral obesity, prostatic hypertrophy, bulky tumour and distorted tissue planes due to neoadjuvant radiotherapy (7). At the beginning of the learning curve, locally advanced tumours should be avoided (7).

A clear advantage of this new technique is represented by the transanal natural orifice specimen extraction. This removes the additional risks associated with abdominal wall incision and contributes to a reduction in postoperative pain and wound complications, decreased use of postoperative analgesia,

faster recovery of bowel function, shorter length of hospital stay, as well as better cosmetic and psychological effects (14). Selection of the approach mainly depends on the size of the specimen, especially the maximum diameter of the tumour.

Transanal specimen extraction with extra abdominal resection was used in this case. In order to avoid direct contact between the specimen and natural orifice the transluminal endoscopic operation port was used. Studies had emerged sustaining the efficacy and safety of this method (15, 16).

In cases where transanal extraction is not suitable (short mesentery, bulky specimen, risk of specimen injury) a suprapubic or short midline incision is advised (17).

Different techniques to perform the anastomosis after TaTME have been published and seem feasible, but no strong evidence supporting one particular technique exists (17). Handsewn coloanal anastomosis is recommended if intersphincteric dissection is performed. A stapled anastomosis can be safely done when enough distal rectal stump remains to form a purse-string suture. The reconstruction has to take into consideration the pelvic anatomy: end to end, side-to-end or colonic J pouch (17). In this case a side-to-end anastomosis was performed.

Short-term complications, especially after neoadjuvant therapy, have been reported: anastomotic complications (leakage and stenosis), pelvic infection, trocar site infection, incomplete intestinal obstruction, gastroplegia and abdominal trocar hernia (18).

Conclusion

TaTME represents a relatively new approach to the treatment of colorectal cancer, which had showed multiple advantages. A careful selection of the patients and a surgical team with substantial experience in minimal invasive colorectal surgery consists the foundation of an optimal technique implementation. Further studies are needed in order to confirm its superiority.

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Note

The abdominal laparoscopic phase of the procedure was performed by Prof. Dr. Cătălin Vasilescu. The transanal phase of the procedure was performed by Dr. Ștefan Tudor.

Conflict of Interest

The authors declare no conflicts of interests.

Authors' contributions

Ștefan Tudor, Corina Minciună - drafting the manuscript and critical revision. Monica Lăcătuș, Daniel Gavrilă, Simona Mănciu, Daniela Ungureanu, Mihai Cordun - critical revision. Monica Lăcătuș, Daniel Gavrilă, Simona Mănciu, Daniela Ungureanu part of surgical and anesthetic team. Ștefan Tudor performing transanal phase of the procedure. Catalin Vasilescu performing abdominal phase of the procedure. Catalin Vasilescu – conception and design of the paper.

References

- Sylla P, Rattner DW, Delgado S, Lacy AM. NOTES transanal rectal cancer resection using transanal endoscopic microsurgery and laparoscopic assistance. *Surg Endosc*. 2010;24(5):1205-10.
- Ma B, Gao P, Song Y, Zhang C, Zhang C, Wang L, et al. Transanal total mesorectal excision (taTME) for rectal cancer: a systematic review and meta-analysis of oncological and perioperative outcomes compared with laparoscopic total mesorectal excision. *BMC Cancer*. 2016;16:380.
- Koedam TW, van Ramshorst GH, Deijen CL, Elfrink AK, Meijerink WJ, Bonjer HJ, et al. Transanal total mesorectal excision (TaTME) for rectal cancer: effects on patient-reported quality of life and functional outcome. *Tech Coloproctol*. 2017;21(1):25-33.
- Arroyave MC, DeLacy FB, Lacy AM. Transanal total mesorectal excision (TaTME) for rectal cancer: Step by step description of the surgical technique for a two-teams approach. *Eur J Surg Oncol*. 2017;43(2):502-5.
- de Lacy AM, Rattner DW, Adelsdorfer C, Tasende MM, Fernandez M, Delgado S, et al. Transanal natural orifice transluminal endoscopic surgery (NOTES) rectal resection: "down-to-up" total mesorectal excision (TME)--short-term outcomes in the first 20 cases. *Surg Endosc*. 2013;27(9):3165-72.
- Simillis C, Lal N, Thoukididou SN, Kontovounisios C, Smith JJ, Hompes R, et al. Open Versus Laparoscopic Versus Robotic Versus Transanal Mesorectal Excision for Rectal Cancer: A Systematic Review and Network Meta-analysis. *Ann Surg*. 2019 Jan 31.
- Buchs NC, Nicholson GA, Ris F, Mortensen NJ, Hompes R. Transanal total mesorectal excision: A valid option for rectal cancer? *World J Gastroenterol*. 2015;21(41):11700-8.
- Zhang X, Gao Y, Dai X, Zhang H, Shang Z, Cai X, et al. Short- and long-term outcomes of transanal versus laparoscopic total mesorectal excision for mid-to-low rectal cancer: a meta-analysis. *Surg Endosc*. 2019;33(3):972-85.
- Vasilescu C, Tomulescu V, Tonea A, Pietraruianu D, Tulbure D, Droc G, et al. Amputation of the rectum via laparoscopy. *Chirurgia (Bucur)*. 1995;44(3):55-8. Romanian
- Vasilescu C, Tomulescu V, Calin I, Nuraltay E. Anterior resection of the rectum via laparoscopy. *Chirurgia (Bucur)*. 1998;93(1):43-8.
- Vasilescu C. Current problems in surgical oncology. Part 3. Total mesorectal excision with curative intent. Why are not all patients with rectal cancer treated with minimally invasive procedures (either by laparoscopy or by robotic surgery)? *Chirurgia (Bucur)*. 2011;106(3):297-9. Romanian
- Atallah S, Albert M, Monson JR. Critical concepts and important anatomic landmarks encountered during transanal total mesorectal excision (taTME): toward the mastery of a new operation for rectal cancer surgery. *Tech Coloproctol*. 2016;20(7):483-94.
- Ferko A, Maly O, Orhalmi J, Dolejs J. CT/MRI pelvimetry as a useful tool when selecting patients with rectal cancer for transanal total mesorectal excision. *Surg Endosc*. 2016;30(3):1164-71.
- Guan X, Liu Z, Longo A, Cai JC, Tzu-Liang Chen W, Chen LC, et al. International consensus on natural orifice specimen extraction surgery (NOSES) for colorectal cancer. *Gastroenterol Rep (Oxf)*. 2019;7(1):24-31.
- Franklin ME, Jr., Liang S, Russek K. Integration of transanal specimen extraction into laparoscopic anterior resection with total mesorectal excision for rectal cancer: a consecutive series of 179 patients. *Surg Endosc*. 2013;27(1):127-32.
- Han FH, Hua LX, Zhao Z, Wu JH, Zhan WH. Transanal natural orifice specimen extraction for laparoscopic anterior resection in rectal cancer. *World J Gastroenterol*. 2013;19(43):7751-7.
- Adamina M, Buchs NC, Penna M, Hompes R, St. Gallen consensus on safe implementation of transanal total mesorectal excision. *Surg Endosc*. 2018;32(3):1091-103.
- Liu X, He G, Li Y, Dong Q, Zhang X, Sun T, et al. Postoperative short-term complications of laparoscope-assisted transanal total mesorectal excision for rectal cancer after neoadjuvant therapy and their management: a single center report. *Zhonghua Wei Chang Wai Ke Za Zhi*. 2019;22(3):255-61.