

TITLE

Robotic total mesorectal excision with rectal stump transabdominal purse string and single stapled anastomosis technique

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ABSTRACT

AIM

The treatment of rectal cancer remains a challenge and the main intraoperative goal is to achieve a nerve sparing total mesorectal excision (TME) with free margins and watertight anastomosis. The robotic approach has achieved improvements in the dissection of the mesorectum. However, the distal section of the rectum remains a technical challenge, often requiring multiple-oblique firings, which can increase the risk of anastomotic leakage.

Robotic TME with rectal stump transabdominal purse string and single stapled anastomosis technique (SST) could be a combination that achieves optimal oncological and postoperative outcomes.

PATIENT AND METHODS

A 38-year-old male, with a well differentiated adenocarcinoma at 7cm from anal verge and CT scan and MRI showing a transmural, concentric and stenosing thickening of the rectal wall, with a small collection in the mesorectal space and multiple suspicious mesorectal nodes (cT4N2M0), was discussed at the MDT meeting.

Chemotherapy and long-course radiotherapy were recommended, followed by a low anterior resection (LAR).

After neoadjuvant treatment, re-staging MRI at 6 weeks showed an apparent reduction in the lesion volume without lymph nodes (cT3N0M0).

RESULTS

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Robotic LAR with SST anastomosis and protective ileostomy was performed. OR time was 266 minutes. There were no intraoperative complications. The patient developed an ileus because of a stenosis at the stoma site. No postoperative leak was observed.

CONCLUSION

This approach allows rectal transection ensuring an adequate margin and anastomosis without cross-stapling with potential advantages of reduced dehiscence in patients with mid-low rectal cancer in whom 2-3 cm of the rectal stump can be preserved.

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CONFLICT OF INTEREST

None of the authors has a conflict of interest.

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TRANSCRIPTION

We present a video of a robotic total mesorectal excision (TME) with rectal stump transabdominal purse string and single stapled anastomosis technique (SST).

The patient is a 38-year-old male who has previous history of endoscopic resection of adenomatous polyps in 2019. He is admitted to the Emergency Room because of hypogastric, rectal tenesmus and an increase in the number of stools without pathological products throughout the previous week.

A CT scan shows rectosigmoiditis with a fluid collection of 2 cm on the anterior face of the rectum without other findings.

The colonoscopy shows a stenosing neoplasia that occupied 3/4 of the circumference, 10 cm from the dentate line. The rectoscopy shows a lesion at 7 cm from the anal verge. An MRI is performed showing a locally advanced neoplasia in the middle third of the rectum, staged as cT4N2M0.

A multidisciplinary oncological committee evaluates the clinical case and neoadjuvant treatment is recommended with a long course of chemoradiotherapy followed by radical surgery after 12 weeks.

We prepare the patient for surgery with a low-fibre diet, mechanical bowel preparation and oral antibiotic prophylaxis, in addition to preoperative nutritional assessment.

The patient is in Lloyd Davies position and surgery starts with the transanal approach. The Lone Star device is used to perform rectal exposure and examination. The level of transection is scored with an electroscalpel.

A transanal purse string is performed with 00 Prolene distal to the tumour. A retractor is placed to allow ideal exposure to perform the rectal transection below the Prolene suture, circumferentially from posterior to anterior.

After this step, the abdominal approach is started. The patient is positioned in Trendelenburg and right tilt.

The anatomical references are marked as we can see in the picture (pubic bone, xiphoid appendix and both superior iliac spines). Ports are positioned using as references both the anterosuperior right iliac spine and the xyphoid appendix.

The robotic Da Vinci Xi system is docked perpendicular to the patient's left side and a first targeting is carried out towards the sigmoid and descending colon junction. The arms are docked and the instruments are inserted using in 1 Tip Up, 2 Bipolar Forceps, 3 Camera and 4 Monopolar Scissors.

The dissection starts on the medial face of the sigmoid mesocolon at the level of the promontory. The origin of the IMA is found which is dissected and transected between two hem-o-locks. The dissection is carried out on the mesocolon towards the DJ junction, the VMI is identified and transected between hem-o-locks. The posterior aspect of the left mesocolon is dissected from the Told's Fascia, preserving retroperitoneal structures. We continue the dissection until the posterior face of the descending colon.

The splenic flexure is mobilised with a medial approach. The dissection is carried out, carefully identifying the body of the pancreas until we can access the lesser sac.

We now move on to the dissection of the upper pancreatic edge and then to the lateral aspect of the descending colon, including the lateral part of the peritoneum and converging with the inferior plane of dissection developed previously. A complete release of the splenic flexure is performed, detaching the greater omentum up to the level of the middle colic vessels.

The second target is performed to facilitate the pelvic dissection once the left colon and splenic flexure are mobilised.

A cotton-loop is placed around the rectosigmoid junction for traction to facilitate the mesorectal dissection without damaging it. Posterior dissection of the mesorectal plane is carried out as far as we can reach, and then both the lateral and anterior aspects of the rectum are dissected. The TME dissection continues circumferentially until the plane of the transanal transection is reached and both planes of dissection merge.

Rectal stump dissection is performed to prepare the rectal wall edges we will use for the 00 Prolene purse-string suture. Unlike during TTSS described by Spinelli et al., where the rectal stump purse string is performed transanally, in this case the purse

string is performed with a transabdominal approach with robotic assistance. We think that this technique facilitates this particular step providing better exposure of the rectal wall.

As we can see, the stitches are full thickness and performed under direct visualization of the rectal wall. The ends of the purse string suture are housed inside the rectal stump for the subsequent transanal externalization.

The last step is the sectioning of the left mesocolon and the ileostomy loop marking.

A wound retractor is used at the anal verge for specimen extraction. During this manoeuvre, we simultaneously check the correct position of the mesocolon at the intra-abdominal level. Prior to colon sectioning, colotomy level is marked according to vascularization using indocyanine green. The anvil is placed through the antimesenteric edge of the descending colon to perform a side to end anastomosis. The colonic edge is transected with a linear stapler using a 60 mm medium-thick load. The anvil is assembled to the circular stapler spike and purse string suture ends are externalized and anastomosis is performed.

We can see that the purse string suture of the surgical edges is intact. The anastomosis is tested under direct vision with a flexible endoscope. A loop ileostomy is performed.

The patient reports rectal bleeding in the immediate postoperative period without haemodynamic instability. On the fourth postoperative day, he gets abdominal distension and a decrease in output from the ileostomy, so a nasogastric tube is inserted. On the fifth day, a CT scan is performed reporting ileus without further complications. The patient is discharged on the seventh postoperative day. The pathology showed a ypT1N1 adenocarcinoma.

In conclusion, this approach allows a TME with transanal rectal transection ensuring an adequate oncological margin and single stapling anastomosis without cross-stapling. Rectal stump purse string is performed transabdominally under direct visualization of the rectal wall.

Potential advantages of this technique are a safe distal resection margin together with a lower anastomotic leak rate in patients with locally advanced neoplasias of the lower third of the rectum in whom 2-3 cm of the rectal stump can be preserved.