



A two-team approach for the complete resection of a bulky gastrointestinal stromal tumor on the anterior wall of the lower rectum after neoadjuvant treatment

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Removing rectal gastrointestinal stromal tumor (GIST) is complicated due to the anatomical constraints of the pelvis. When a tumor exists on the anterior wall of the very low rectum with the potential invasion of the prostate in male patients, it can be more challenging to preserve the urinary system and anal sphincter function. In recent years, the transanal approach has been one of the better surgical techniques for lower rectal cancer to overcome these issues [1–3]. The transanal approach can provide an accurate view of the tumor and prostate and allow dissection of the precise plane at the distal tumor end with a negative resection margin.

The patient was a 67-year-old man with a massive bloody bowel discharge. A colonoscopy revealed a giant submucosal tumor in the anterior wall of the very low rectum, 1 cm above the Herrmann line. The tumor was partially self-destructive, and bleeding occurred. Magnetic resonance imaging (MRI) revealed a 96 mm mass in the pelvic cavity, which put forward pressure on the prostate, and the boundary between the prostate and the tumor was unclear. Histopathologically, a biopsy showed spindle-shaped cells that were positive for c-kit and CD34 and negative for S-100 and desmin. The mitotic rate was 2 per 50 high-power fields. These findings were consistent with the diagnosis of low-grade GIST [4, 5]. The patient was administered preoperative adjuvant therapy with imatinib mesylate (IM; 400 mg/day) to avoid total pelvic exenteration and preserve urinary and anal function. After 6 months of preoperative treatment using IM, the rectal GIST shrunk significantly (Fig. 1).

This video demonstrates a successful two-team technique for the complete resection of a bulky GIST on the anterior wall of the lower rectum after neoadjuvant IM administration.

Surgical techniques

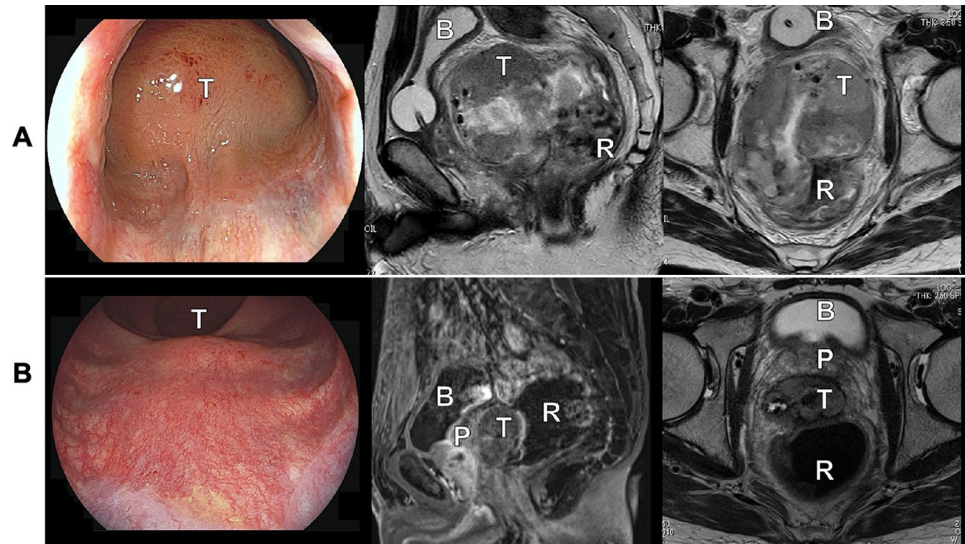
First, the transanal team applied a self-retaining anal retractor system (Lone Star Self-Retaining Retractors, Cooper Surgical, USA) to retract the skin at the anal verge to expose the anal canal. Under direct visualization, a full circumferential incision was made above the dentate line. A 2–0 non-absorbable suture (Prolene®, Ethicon, USA) with a 26 mm rounded needle was used to place a purse-string suture through the rectal mucosa to occlude the rectum tightly. The intersphincteric space was then dissected into the upper anorectal ring. Next, a transanal access platform system (GelPOINT Path Transanal; Applied Medical, USA) was inserted and sealed from the anal verge. Carbon dioxide (CO₂) was insufflated to maintain a pressure of 12 mmHg using the AirSeal® platform (AirSeal® System; CONMED, USA). A 0° rigid scope (IMAGE1 S™ 4U camera system; KARL STORZ, Germany) was inserted through a 12-mm AirSeal port. We used an L-shaped monopolar electric knife (OPTI2 CleanCoat™; Medtronic, USA) to dissect the natural boundary sharply down-to-up between the levator ani muscle and mesorectum for the pelvic cavity. The laparoscopic team simultaneously performed transabdominal total mesocolic excision according to a standard protocol. The boundary between the posterior prostate and the tumor was unclear, and severe inflammatory changes were observed. The transanal process was carefully performed and assisted by synchronous transabdominal dissection on the proximal left side of the posterior prostate and the tumor. The transanal team

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Fig. 1 Endoscopic and magnetic resonance imaging (MRI). Endoscopic findings revealed a large mass on the anterior wall of the rectum, 1 cm above the Herrmann line. Pelvic MRI findings showed a 9.6 cm mass between the prostate and the anterior wall of the rectum. **A** Before neoadjuvant treatment, **B** After 6 months of neoadjuvant therapy. *T* tumor, *R* rectum, *P* prostate, *B* bladder



later recognized the posterior prostate from the left side by dissecting the rectum and neurovascular bundle laterally. The transanal approach was rendezvoused with the transabdominal approach on the cephalic side of the tumor to access the abdominal cavity. Furthermore, the optimal resection plane between the prostate and tumor was dissected using the posterior prostate as a landmark. Finally, complete resection of the tumor was performed without damaging the prostate or urethra. Handsewn coloanal anastomosis was performed using a suture folder (TMP suturing®; Tokai Medical Products Inc., Japan) with a total of 21 sutures of 4–0 and 3–0 absorbable sutures (PDS-II® and Coated Vicryl®, Ethicon, USA), and a temporary ileostomy was created. The total operation and perianal phase times were 219 and 149 min, respectively. The intraoperative blood loss was 10 mL. The surgical site was uneventful. However, the patient had difficulty self-managing the temporary ileostomy and required the intervention of a specialist nurse, resulting in an extended postoperative hospital stay of 14 days. A negative specimen margin was confirmed based on pathological findings. Most tumor cells disappeared due to fibrosis and vitrification. Unfortunately, temporary loop ileostomy closure was delayed due to the COVID-19 pandemic. 13 months postoperatively, a stoma closure operation was performed.

In conclusion, our team safely accomplished the complete resection of a large GIST in the anterior rectal wall after neoadjuvant therapy using a two-team minimally invasive approach without multiple visceral resections and urethral injury.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval The manuscript complies with ethics requirements.

Informed consent The patient provided informed consent for the publication of this report and associated images.

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