

Case Report

Transvaginal ultra-low anterior resection for low rectal gastrointestinal stromal tumor after neoadjuvant imatinib: a case report

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ABSTRACT

Rectal gastrointestinal stromal tumors (GISTs) are uncommon and their low pelvic location makes complete resection with preservation of the anal sphincter technically challenging. Neoadjuvant imatinib may facilitate organ-preserving surgery. We report a transvaginal ultra-low anterior resection for a low anterior rectal GIST in a woman. A 45-year-old woman presented with bleeding per rectum. Digital rectal examination revealed an anterior rectal wall lesion with distal lesion extending to approximately 4 cm from the anal verge. Colonoscopy showed an ulcerated submucosal growth at the anorectal junction. Biopsy demonstrated a GIST positive for CD117 and DOG1, with a reported mitotic index of 3/50 high-power fields. After 6 months of imatinib 400 mg daily, imaging demonstrated approximately 50% reduction in tumor dimensions. Pre-operative MRI showed a well-defined exophytic T2 hyperintense lesion 5×4×3 cm in anterior wall of mid and lower rectum projecting into recto-vaginal space. Lowermost point of contact is 2.5 cm from anal verge, displacing the cervix and vagina anteriorly with preserved fat planes. Anal canal and sphincter complex appear uninvolved. Pelvic side walls appear free. At operation, a 5×4×3 cm circumscribed submucosal distal rectal tumor was identified, with a partly exophytic component impinging on the vagina. Following abdominal mobilization and proximal rectal transection, the posterior vaginal wall was incised and the distal rectum was transected with a reported 1-cm distal margin. The specimen was retrieved transvaginally and a coloanal anastomosis was constructed using interrupted 2-0 Vicryl sutures. The vaginal mucosa was closed with 2-0 Vicryl and a diverting ileostomy was created. Final histopathology showed spindle-cell GIST, mitotic index of 3/50 high-power fields with free proximal and distal margins and reported pT3N0 stage. The patient continued postoperative imatinib. A rectovaginal fistula developed at 6 months, was surgically repaired and healed. Ileostomy closure was performed 2 months later. At 14 months of follow-up, she remained well with unremarkable bowel and bladder function. In carefully selected women with a low anterior rectal GIST, a transvaginal route can provide direct access to the distal rectum and may facilitate sphincter-preserving resection. Further experience and longer follow-up are required to establish its oncological and functional outcomes.

Keywords: Rectal gastrointestinal stromal tumor, Transvaginal approach, Ultra-low anterior resection, Coloanal anastomosis, Imatinib, Sphincter preservation

INTRODUCTION

Gastrointestinal stromal tumors (GISTs) are the most common mesenchymal tumors of the gastrointestinal tract

and most frequently arise in the stomach and small intestine.¹ Rectal GISTs are uncommon, accounting for approximately 1.6–5% of GISTs in published series.² Their management is challenging because the tumor may

be located close to the anal sphincter and adjacent pelvic organs. Complete resection with negative margins and avoidance of tumor rupture are fundamental surgical principles.^{1,6}

The development of tyrosine kinase inhibitors, particularly imatinib, has altered the management of locally advanced GIST.⁶ In rectal GIST, neoadjuvant imatinib may reduce tumor burden and facilitate sphincter and organ preservation.² In selected women with an anterior low rectal lesion, the transvaginal route provides direct access to the rectovaginal plane and has been described for local excision of rectal GISTs.³⁻⁵

We present a case of a low anterior rectal GIST treated after neoadjuvant imatinib by abdominal mobilization followed by transvaginal ultra-low anterior resection, transvaginal specimen extraction and coloanal anastomosis.

CASE REPORT

Patient and clinical findings

A 45-year-old woman presented with bleeding per rectum. Digital rectal examination revealed a growth arising from the anterior wall of the rectum. The lower extent was approximately 4 cm from the anal verge.

Diagnostic assessment

Pelvic magnetic resonance imaging demonstrated a well-defined exophytic T2-hyperintense lesion measuring 9.3×8.2×8.6 cm in low anterior rectum with slightly lobulated margins extending into the rectovaginal space with extraneous compression on posterior wall of urinary bladder. No lymph nodal involvement, no distant metastasis

Colonoscopy demonstrated an ulcerated submucosal growth at the anorectal junction. Biopsy and immunohistochemical examination were consistent with GIST, with CD117 and DOG1 positivity. The reported mitotic index was 3/50 high-power fields.

Neoadjuvant treatment

The patient received oral imatinib 400 mg once daily for 6 months as neoadjuvant therapy.

Post neoadjuvant pelvic magnetic resonance imaging (MRI) showed a well-defined exophytic T2-hyperintense lesion measuring 5×4×3 cm arising from the anterior wall of the mid and lower rectum and projecting into the rectovaginal space. The lowermost point of contact was 2.5 cm from the anal verge. The lesion displaced the cervix and vagina anteriorly, with preserved intervening fat planes. The anal canal and sphincter complex were uninvolved. The pelvic sidewalls were free of disease. (Figure 1)

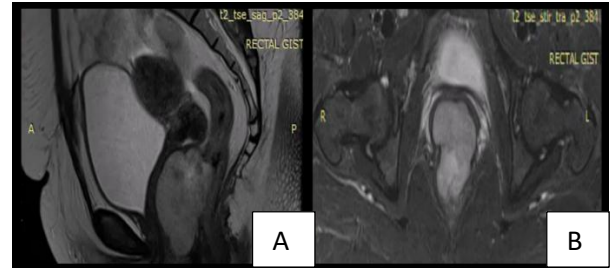


Figure 1: Pre-operative magnetic resonance imaging (MRI) (A) Sagittal T2-weighted image demonstrating a well-defined, exophytic T2-hyperintense lesion arising from the anterior wall of the mid and lower rectum, with projection into the rectovaginal space. (B) Coronal T2-weighted image demonstrating the extent of the tumor and its relationship to the vagina and cervix. The anal canal and sphincter complex are uninvolved, with preserved intervening fat planes and no involvement of the pelvic sidewalls.

Following 6 months of neoadjuvant imatinib, the tumor showed an approximately 50% reduction in its measured dimensions.

Operative technique

Operative findings

A soft, fleshy, well circumscribed submucosal tumor measuring approximately 5×4×3 cm was identified in the distal rectum, with its distal extent approximately 3 cm from the anal verge. A small area of mucosal ulceration was present. The tumor was partly exophytic and impinged on the vagina, with minimal adhesions. Abnormal neovascularized vessels were noted adjacent to the tumor.

Abdominal part

The sigmoid mesocolon was dissected and the inferior mesenteric artery and vein were ligated. The splenic flexure was mobilized and the rectum was dissected circumferentially. Anterior Pouch of Douglas incised and plane created between vagina and rectal wall. Proximal transection done at Recto-sigmoid junction was performed.

Schematic illustration of the transvaginal approach given in Figure 2

Trans-vaginal part

For the distal component, a transvaginal approach was used. The posterior vaginal mucosa was incised and a plane was developed between the posterior vaginal wall and the rectum. Distal rectal transection was performed with adequate distal margin. The specimen was retrieved through the vagina. There was no intraoperative tumor rupture. A coloanal anastomosis was then constructed

using interrupted 2-0 Vicryl sutures through the transvaginal route. (Figure 3)

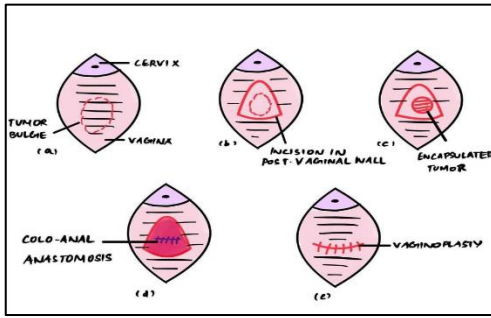


Figure 2: Schematic illustration of the transvaginal approach, demonstrating posterior vaginal wall incision, entry into the rectovaginal plane and direct access to the distal rectal tumor.

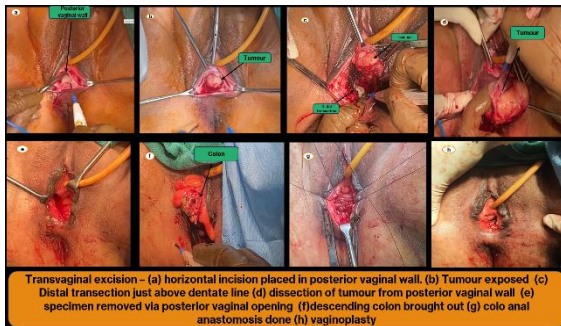


Figure 3: Operative steps of transvaginal ultra-low anterior resection for low rectal gastrointestinal stromal tumor.

The posterior vaginal wall was closed with interrupted 2-0 Vicryl sutures. A diverting loop ileostomy was created to protect the low coloanal anastomosis. The total operative time was 5 hours and estimated blood loss was less than 50 ml. The resected specimen had a 1 cm distal resection margin and was sent for histopathological analysis (Figure 4).

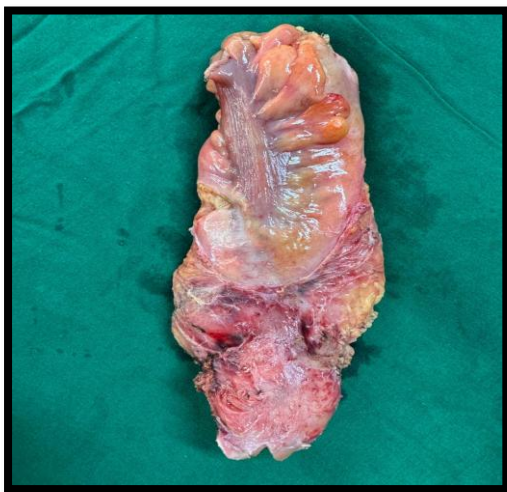


Figure 4. Resected specimen.

Histopathology

Final histopathology demonstrated a spindle-cell type GIST, IHC, DOG-1 positive (Figure 5). The postoperative mitotic index was 3/50 high-power fields. The proximal and distal resection margins were free of tumor. The pathological stage was reported as pT3N0.

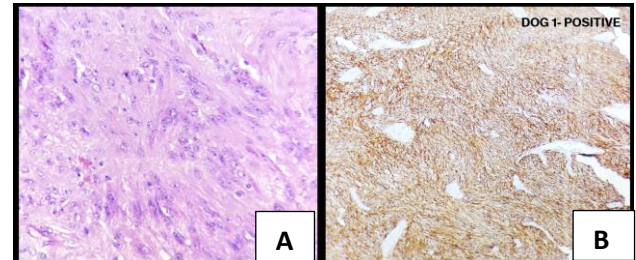


Figure 5: Histopathological and immunohistochemical examination of the resected tumor. (A) Hematoxylin and eosin staining demonstrating a spindle-cell neoplasm arranged in interlacing fascicles (B) DOG-1 immunohistochemical staining showing positive tumor-cell staining, supporting the diagnosis of gastrointestinal stromal tumor.

Postoperative course and follow-up

The patient was continued on postoperative imatinib. A diverting ileostomy was maintained. At 6 months after surgery, follow-up magnetic resonance imaging demonstrated a rectovaginal fistula. The fistula was surgically repaired and subsequently healed. Two months after successful fistula healing, the diverting ileostomy was closed. At approximately 14 months of postoperative follow-up, while continuing imatinib, the patient remained clinically well. Functional bowel and bladder outcomes were unremarkable.

DISCUSSION

Rectal GISTs present a distinct surgical challenge because the tumor may lie deep within the pelvis and close to the anal sphincter. Unlike rectal adenocarcinoma, routine lymphadenectomy is generally not required for GIST, and the principal surgical objectives are complete tumor removal, negative margins and avoidance of tumor rupture.^{1,6} These features create an opportunity for tailored organ-preserving procedures in appropriately selected patients.

Neoadjuvant imatinib can be particularly useful for rectal GIST because tumor shrinkage may improve the feasibility of a sphincter-preserving operation. In a retrospective series of 47 localized rectal GISTs, Cavnar et al. reported that neoadjuvant imatinib was associated with greater organ preservation and more frequent negative margins among high-risk patients.² These findings support the use of preoperative imatinib as part of an individualized strategy for selected locally advanced rectal GISTs.^{2,6}

For anterior low rectal tumors in women, the transvaginal route offers direct access to the rectovaginal plane. Hara et al. reported transvaginal resection of a rectal GIST in a 45 year old woman with an anterior lower rectal tumor.³ Wang et al. subsequently reported transvaginal excision in two patients and reviewed the published experience, suggesting that the approach may be a minimally invasive alternative for selected low rectal stromal tumors.⁴ A further case report published in 2024 described successful transvaginal resection of an anterior rectal GIST in a 21-year-old woman, further supporting the technical feasibility of this approach in carefully selected patients.⁵

The present case extends this concept from local transvaginal excision to a combined abdominal and transvaginal ultra-low anterior resection. The abdominal component provided mobilization of the colon and proximal rectum, while the transvaginal component allowed direct access to the distal rectum, distal transection, specimen extraction and construction of the coloanal anastomosis. The reported negative proximal and distal margins are encouraging from an oncological perspective, consistent with the established principle that complete resection without tumor rupture is the key surgical objective in localized GIST.^{1,6}

The transvaginal route has several potential technical advantages. The vagina is relatively compliant and provides direct visualization of the posterior vaginal wall and rectovaginal plane. The tumor can also be assessed by palpation from the rectal side, potentially helping the surgeon identify the tumor boundary.^{3,4} At the same time, the approach has important limitations. It requires careful patient selection, appropriate pelvic anatomy, multidisciplinary surgical expertise and meticulous attention to avoidance of tumor rupture and pelvic contamination.³⁻⁵ Vaginal incision and reconstruction also require appropriate gynecological or colorectal pelvic surgical expertise.

An important complication in this case was the development of a rectovaginal fistula detected on magnetic resonance imaging at 6 months. The fistula was repaired successfully and subsequently healed, after which the diverting ileostomy was closed 2 months later. This complication is clinically relevant because the transvaginal approach creates a communication between the vaginal and rectal operative fields, and the distal rectal resection and coloanal anastomosis are performed in close proximity to the posterior vaginal wall. The use of a diverting ileostomy in this case provided fecal diversion during healing and may be particularly prudent when the rectal resection is very low or the vaginal wall has been entered. Published transvaginal rectal GIST reports have emphasized careful dissection and closure of the vaginal defect as important technical considerations.³⁻⁵

CONCLUSION

The main limitation of this report is that it describes a single patient and therefore cannot establish comparative oncological or functional superiority. Nevertheless, the patient has had approximately 14 months of clinical follow-up on imatinib with satisfactory bowel and bladder function and no reported clinical evidence of recurrence. The occurrence and successful management of a rectovaginal fistula should also be considered when counselling patients about the potential morbidity of this approach.

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