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CASE REPORT

Para-sacral approach for large gastrointestinal stromal tumor of the lower rectum

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Abstract
Rectal gastrointestinal stromal tumor (GIST) is comparatively rare and usually already large when detected. As resection is the main therapy for patients with primary resectable GIST, the surgical procedure must be tailored to the tumor status. For GISTs of the lower rectum, laparoscopic low anterior resection or abdominoperineal resection is one of the procedures of choice. However, rectal tumor, including rectal GIST, can also be surgically treated using a variety of posterior approaches. Of these, para-sacral approach is both simple and less invasive, even for large rectal GISTs, and provides a good view of the operative field. Here, we describe our procedure for the surgical treatment of large GISTs of the lower rectum.

Keywords Para-sacral approach · Gastrointestinal stromal tumor · Lower rectum

Abbreviations
GIST Gastrointestinal stromal tumors
LAR Low anterior resection
APR Abdominoperineal resection

Introduction

The local removal of rectal tumor is frequently achieved using posterior approaches [1]. However, lower anterior resection (LAR) and abdominoperineal resection (APR) are more commonly selected in rectal gastrointestinal stromal tumors (GISTs), probably because of the lower frequency of these tumors than rectal adenocarcinoma.

Unlike rectal adenocarcinoma, rectal GISTs are rarely accompanied by locoregional lymph node metastasis, but instead show extraluminal growth that does not cause symptoms. Additionally, local resection with slightly negative margins is generally considered adequate even for large GISTs.

Our own preference in such cases is para-sacral approach, as it allows safe and less invasive resection with organ preservation, and results in cure. Para-sacral approach could be one of the useful approaches for the treatment of lower rectal GISTs. The procedure used in our institution is described herein.

Case presentation

Two patients with large GISTs underwent tumor resection at our institution using para-sacral approach. The first patient was a 70-year-old female who had a localized, 5.0 × 4.5 cm GIST. Following the recommendation of APR and colostomy at a previous hospital, she came to our center for the second opinion. Diagnostic imaging showed a large submucosal tumor in the posterior and left lateral wall of the lower rectum (Fig. 1a). The second patient was a 72-year-old female with recurrent GIST who was admitted to our center to determine the operability of the tumor. At a previous hospital, she had been treated with imatinib, which resulted in reduction of the tumor. However, she developed interstitial pneumonia, attributed to imatinib therapy, and treatment was stopped. Contrast-enhanced computed tomography showed a 4.1 × 3.7 cm mass decreased density and located adjacent to the vagina, in the anterior and right lateral walls of the lower rectum (Fig. 1b).

Our surgical technique is shown in Fig. 2. Both patients were placed in the jack-knife position, which allowed para-sacral skin incisions about 2 cm away from the sacrum. A region extending to the lower edge of the gluteus maximus muscle was dissected, and ~ 5.0 cm of tissue was removed.

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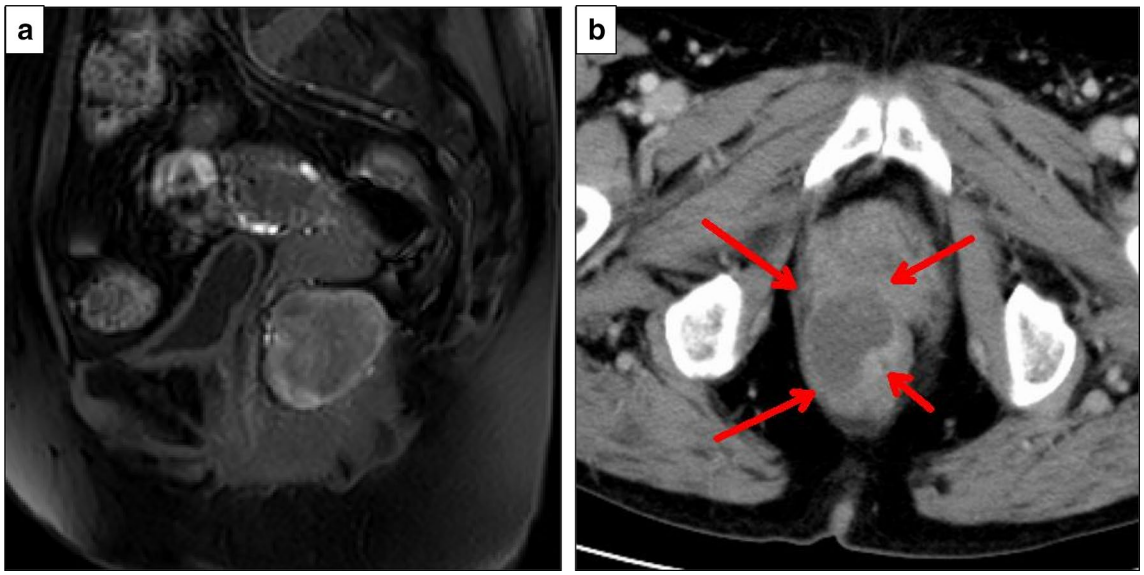

Fig. 1 **a** Patient 1 had a localized, large GIST 5.0×4.5 cm in size. **b** Patient 2 had a recurrent large GIST 4.1×3.7 cm in size and located adjacent to the vagina

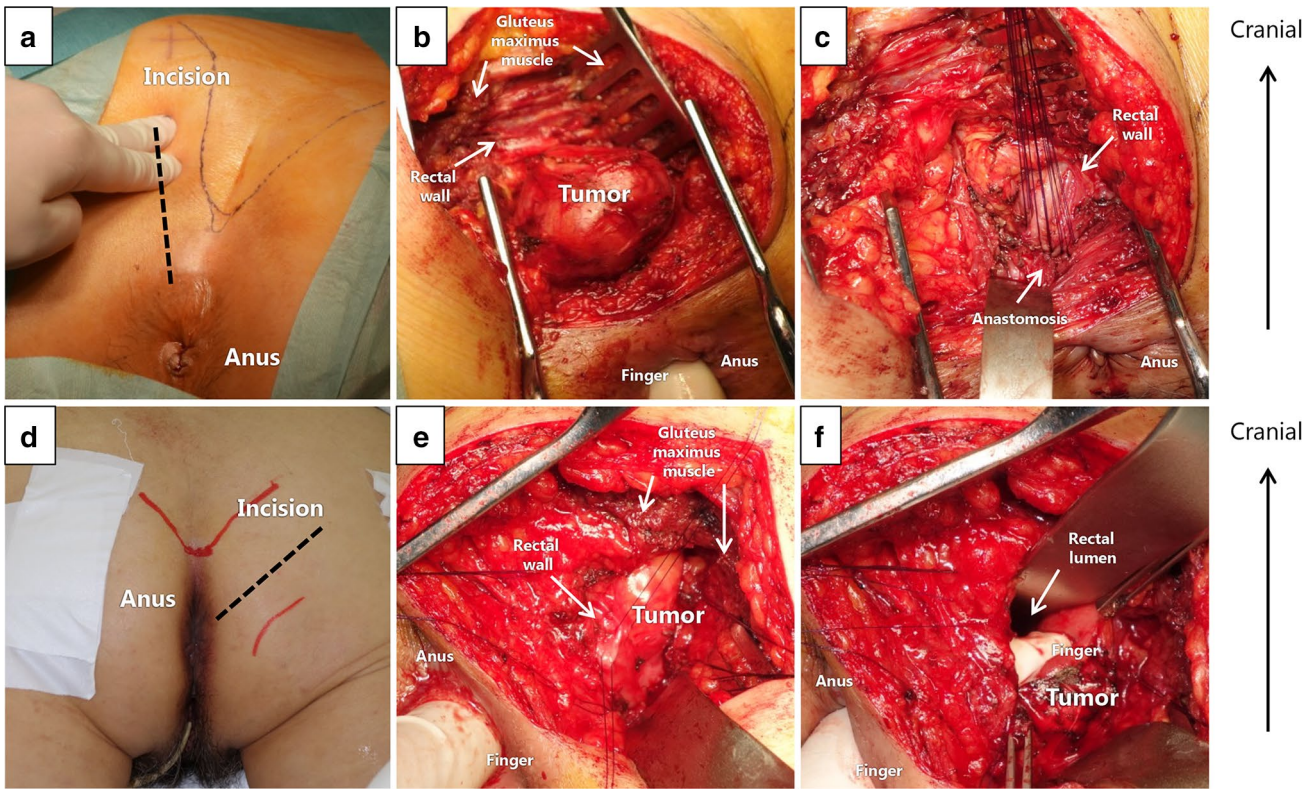

Fig. 2 The para-sacral approach in patient 1 (**a, b, c**) and patient 2 (**d, e, f**). **a, d** The para-sacral skin incisions. **b, e** Both the normal wall of the rectum and the tumor are easily confirmed manually from the rectal lumen. **c, f** Segmental tumor resection and Albert-Lembert sutures for the anastomosis

The rectal wall and the tumor were confirmed manually from the rectal lumen, after which the levator ani muscle tagged with matching sutures was cut to expose the perirectal area. After cutting a part of external anal sphincter and separating

the mass from the surrounding tissue, we confirmed that the rectal wall was normal. Segmental tumor resection was followed by Albert-Lembert sutures for the anastomosis. Postoperatively, both patients had uneventful recoveries and were discharged home without any symptoms. The first patient and the second patient have no recurrence 30 and 20 months after the surgery, respectively.

Discussion

In our opinion, the posterior para-sacral approach described herein is the optimal procedure for the surgical management of large lower rectal GISTs. In the present cases, colorectal surgeons tend to choose a laparoscopic LAR with anastomosis, using a double stapling technique, or an APR. However, the most important factors determining surgical success are the curability, suitable invasiveness for patients, and safety of the operation.

GISTs of the lower rectum constitute less than 5% of all GISTs [2]. In general, GISTs exhibit two specific features: (1) the extreme rarity of locoregional lymph node metastases despite growth of the tumor, and (2) a tendency to exhibit extraluminal growth. Considering these features and the curability of these tumors, laparoscopic LAR or APR may constitute excessive treatment. Some of the treated patients will need a temporary ileostomy or permanent colostomy. Moreover, as most rectal GISTs are asymptomatic and thus detected after they have become quite large, laparoscopic LAR may be dangerous, especially in men with narrowed pelvis.

The posterior local removal of lower rectal GISTs is typically achieved using a trans-anal, trans-vaginal, or trans-sacral approach without the need for a laparotomy. The posterior approaches make us to avoid the risk of urogenital and nerve dysfunction occurred by total mesorectal excision [3–5]. Suzuki et al. reported a series of 26 rectal tumors, including a GIST, which were treated by trans-anal endoscopic microsurgery in 2005 [6]. Hellan et al. [5] introduced the trans-vaginal approach in 2006, whereas Hargrove et al. [7] reported a trans-sacral approach that has since been used in the surgical treatment of rectal adenocarcinoma or GIST [8, 9]. As cited by the authors, the benefits of these approaches are the minimal invasiveness, the safety even for large tumors, and the good operative field of view. Surgery for GISTs must achieve complete removal of the tumor with clear margins to prevent local recurrence with less invasiveness. The trans-sacral approach is, therefore, a relatively major procedure for large tumor. However, the coccyx, or the coccyx and S5, need to be reduced. There are many advantages to the posterior para-sacral approach: no scar on the abdomen, excellent exposure of the tumor without damage to the anal sphincter muscles or other organs, easy-access to manually confirm the rectal wall and the tumor in the rectal lumen, and an operating time shorter than that of laparoscopic LAR or APR. However, for tumor which is located in the middle third of the rectum, the trans-sacral approach is more useful than the para-sacral approach from the anatomical point of view. Furthermore, the para-sacral approach was reported to induce surgical site infection, fecal fistula, and anal dysfunction [10]. The efficacy and safety of the posterior para-sacral approach should be confirmed in large-scale prospective studies.

In conclusion, the para-sacral approach is less invasive than other approaches for large lower rectal GISTs. Because of its simplicity, it could be one of the useful approaches for the treatment of these tumors. Importantly, the para-sacral approach should not be performed for tumors which invade the anal sphincter or other organs, or which are too large to be adequately resected.

Compliance with ethical standards

Conflict of interest The authors have no conflicts of interest to declare. No financial support was received for the work described in this manuscript.

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