Robot-assisted resection of rectal duplication cysts: A case report

Masaki Kitazono[1], Makoto Fujita[2], Tomohiro Oyama[1], Naotaka Ikeda[1], Mayumi Eguchi[1], Go Kamimura[1], Rikiya Sato[1], Shuichiro Uchiyama[1], Ryoichi Toyosaki[1], Toyokuni Suenaga[1], and Shunji Shimaoka[2]

[1]Nanpu Byoin
[2]Nanpuh Hospital

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Abstract

Rectal duplication cysts are extremely rare and account for only 4% of all gastrointestinal duplication cysts. They may become difficult for removal in the case of a large tumor in a narrow pelvis. Herein, we report a case of rectal duplication cysts excision via robotic-assisted laparoscopic surgery and its utility.

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[1]Department of Surgery, Nanpuh Hospital

[2]Division of Medical Support, Nanpuh Hospital

[3]Department of Gastroenterology, Nanpuh Hospital

Public Interest Incorporated Association, Kagoshima Kyousaikai, Nanpuh Hospital 14-3, Nagata Cho, Kagoshima City, Kagoshima Pref. 892-8512, Japan

Tel +81-99-226-9111

Fax +81-99-223-1573

Keywords

Rectal duplication cysts, robotic-assisted laparoscopic surgery, RALS, the da Vinci system

Key Clinical Message

A case of a 52 years old female patient with a rectal duplication cyst is reported. Smooth and safe surgery can be expected with robot assistance when a large tumor occupies a narrow pelvis, which is difficult to operate with conventional surgery.

Abstract

Rectal duplication cysts are extremely rare and account for only 4% of all gastrointestinal duplication cysts. They may become difficult for removal in the case of a large tumor in a narrow pelvis. Herein, we report a case of rectal duplication cysts excision via robotic-assisted laparoscopic surgery and its utility.

Introduction

Alimentary tract duplications are rare developmental anomalies that can occur anywhere in the intestinal tract. The definition was proposed that it is covered by flat muscles, has a gastrointestinal mucosa on the inner surface, and is in close contact with the part of the gastrointestinal tract. The first symptoms of rectal duplication are often constipation and abdominal distension, probably because of the exclusion of the intestinal tract.

Ladd and Gross described intestinal duplications in 1941, as having an attachment or adherence to some part of the gastrointestinal tract, the presence of a smooth muscle wall, and a mucosal lining with one or more cell types of the gastrointestinal tract[(1)]. Rectal duplicate cysts are the least common among the gastrointestinal congenital cysts, forming only 4% of them[(2)], and they are known to derive from the hindgut[(3)].

Presentation in adult rare, usually they present in childhood with infection, fistulization or mass effects such as tenesmus, constipation, prolapse and urinary retention [(4, 5)]. We herein report a case of an adult woman with rectal duplication cysts excision via robotic-assisted laparoscopic surgery and its utility.

Case Report

A 52 years old woman with a large pelvic cyst was admitted to our hospital. There was no history of other gastrointestinal conditions, cardiovascular conditions, infection, trauma, or family history. She had undergone right breast cancer resection 2 years ago, and the pelvic cyst was detected by positive emission tomography in the preoperative examination for the breast cancer. There were no symptoms and findings of malignancy, so she was kept under observation. However, a follow-up CT showed an increasing tendency of cystic mass in size, and she was referred to our hospital. Her laboratory studies were unremarkable except for CA19-9. The level of CA19-9 was 142.4U/ml. CT of the pelvis with contrast revealed a 4.5 cm well-defined, homogenous cystic mass in the right para-rectal area (Fig.1). The inside has a poor contrast effect, and there are no findings suggestive of a solid component. Pelvic MRI with contrast demonstrated a 4.4cm retroperitoneal cystic tumor with high signal intensity on T1-weighted images in the right para-rectal area (Fig.2). The cyst appeared continuous with the rectal wall.

The patient underwent robot-assisted low anterior resection without a preoperative definitive diagnosis. Epidermoid cyst, duplication cyst, and tailgut cyst were mentioned as differential diagnoses based on the radiological findings. Access was gained with a 8-mm supraumbilical metallic robot port followed by four same-size ports (Fig.3). The abdomen was insufflated to an abdominal pressure of 10 mm Hg with CO2 gas supplied by AIR SEAL® intelligent flow system. The mesorectal dissection from the sacral promontory was continued up to the level of puborectalis sling and the levator ani muscles. After cystic tumor-specific mesorectal excision was performed, the clip for the bowel clamp was applied to the distal side of the cystic tumor for transanal bowel irrigation. The patient-side cart was rolled out after transection of the rectum with the cyst. The umbilical wound was then extended to retrieve the specimen and closed. For subsequent anastomosis, the double stapling technique was performed by using a circular stapler. The excisions of cysts were complete with macroscopically negative margins. There was no intraoperative event and the operative time was 356 minutes.

The surgical specimens consisted of a cystic lesion from the posterior wall of the rectal to the right side, with no continuity with the rectal lumen (Fig.4). Histologically, most of the cyst lumen has epithelial shedding, granulation tissue and histiocyte clusters, and numerous cholesterin fissures and hemosiderin deposits in the thickened fibrous connective tissue. The remaining epithelium shows morphology similar to anal canal epithelium, which is a mixture of goblet cells in a cubic to columnar epithelium of about five layers, and squamous epithelium-like. The epithelium is surrounded by developed smooth muscle tissue and transitions to skeletal muscle tissue, which is thought to be the levator ani muscle. It is a tissue image that distinguishes between a duplication cyst and a tailgut cyst. Although the nerve plexus is not clear and the epithelium is not a glandular epithelium, which is not typical as a duplication cyst, the above diagnosis was made because the thickening of the muscular layer is conspicuous to make it a tailgut cyst.

The postoperative course was uneventful. The patient was discharged 27 days after surgery, and she has remained in excellent health so far for a year and 5 months.

Discussion

Alimentary tract duplications are spherical or tubular structures, one of the rare developmental anomalies that can occur anywhere in the intestinal tract from the tongue to the anal canal. Most of the duplications are found in the pediatric population and involve the small bowel. On the other hand, colonic duplication cysts represent 6.8% of gastrointestinal duplication cysts [(6)]. The definition was proposed that it is covered by flat muscles, has a gastrointestinal mucosa on the inner surface, and is in close contact with the part of the gastrointestinal tract [(1)]. However, there are some cases reported as gastrointestinal duplication even if all three conditions are not met. This case met all of the above three items.

The shape of the alimentary tract duplications is roughly classified into tubular and spherical. The colon as a whole has many tubular overlapping intestines, but the rectum has many spheres. In the rectum, it is said to occur frequently in the posterior wall.

The first symptoms of rectal duplication are often constipation and abdominal distension, probably because of the exclusion of the intestinal tract. In some cases, it escapes outside the anus[(7, 8)]. Overlapping ureters, bladder malformations, fistulas with the urethral system, and pyuria may be present[(7)]. There are also cases of multiple intestinal infections and bleeding. The epithelium of duplication cyst is usually the colonic mucosa [(9)], but in rare cases, ectopic gastric mucosa may be present. It causes ulcers and bleeding.

Surgical resection is the main treatment of choice[(5)]. If the main intestine and the wall of the duplication tract share a muscular layer, a method of removing only the mucosa may be used. There is also a report that malignancy is observed when asymptomatic progresses despite the presence of ectopic gastric mucosa [(10)]. We chose robot-assisted rectal resection as the surgical procedure.

Conclusion

A patient with rectal duplication cysts may be asymptomatic, but they can cause constipation, gastrointestinal bleeding, and malignant disease, so appropriate treatment is required at the appropriate time. In the case of a large tumor in a narrow pelvis as in this case, smooth and safe surgery can be performed with the assistance of a robot. Because, with the da Vinci Surgical System, a 3D monitor is displayed in high definition and the tip of the forceps has seven degrees of freedom with 540 degrees of arm rotation that mimic the skillful movement of human joints, enabling precise surgery in a narrower area.

A large cyst was occupying the pelvis also in this case, and it should have been difficult to operate without the robot assistance because the field of view was poor. Robot-assisted surgery, when removing large cysts in the pelvis, enables to secure the surgical field and perform smooth forceps operations in a relaxed state.

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Consent

The patient has provided written consent for the case report to be published.

Conflicts of interest

The authors declare no conflicts of interest in association with this study.

Authors' Contributions

MK drafted the manuscript. MF gathered the data and edited the draft. TO, NI, ME, GK, RS, SU, RT and TS participated in the critical revision of the manuscript. All authors read and approved the final manuscript.

Ethical Statement

Informed consent was obtained from the patient regarding the report of his clinical scenario data in an anonymous way.

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