


CASE REPORT

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

Masaki Kitazono¹  | Makoto Fujita² | Tomohiro Oyama¹ | Naotaka Ikeda¹ |
Mayumi Eguchi¹ | Go Kamimura¹ | Rikiya Sato¹ | Shuichiro Uchiyama¹ |
Ryoichi Toyosaki¹ | Toyokuni Suenaga¹ | Shunji Shimaoka³

¹Department of Surgery, Nanpuh Hospital, Kagoshima-city, Japan

²Division of Medical Support, Nanpuh Hospital, Kagoshima-city, Japan

³Department of Gastroenterology, Nanpuh Hospital, Kagoshima-city, Japan

Correspondence

Masaki Kitazono, Public Interest Incorporated Association, Kagoshima Kyosaikai, Nanpuh Hospital 14-3, Nagata-cho, Kagoshima-city, Kagoshima Pref. 892-8512, Japan.
Email: opera_2@hotmail.com

Funding information

None.

Abstract

Rectal duplication cysts are extremely rare and account for only 4% of all gastrointestinal duplication cysts. They may become challenging 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.

KEYWORDS

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

1 | 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 duplication cysts are the least common among the congenital gastrointestinal

cysts, forming only 4% of them,² and they are known to derive from the hindgut.³

Presentation in adult is 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.

2 | CASE REPORT

A 52-year-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 PET 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 a 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 142.4 U/ml. CT of the pelvis with contrast revealed a 4.5 cm well-defined, homogenous cystic mass in the right para-rectal area (Figure 1). The inside had a poor contrast effect, and there were no findings suggestive of a solid component. Pelvic MRI with contrast demonstrated a 4.4 cm retroperitoneal cystic tumor with intermediate signal intensity on T1-weighted images in the right para-rectal area (Figure 2). The cyst appeared continuous with the rectal wall.

The patient underwent robot-assisted low anterior resection without a definitive preoperative diagnosis. Epidermoid cyst, duplication cyst, and tailgut cyst were mentioned as differential diagnoses based on the radiological findings. Access was gained with a supraumbilical 8 mm camera port followed by three same-size ports (Figure 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 min.

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 (Figure 4). Histologically, most of the cyst lumen has epithelial shedding, granulation tissue and histiocyte clusters, and numerous cholesterolin fissures and hemosiderin deposits in the thickened fibrous connective tissue. The remaining epithelium showed morphology similar to anal canal epithelium, which was 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 was a tissue image distinguishing between a duplication cyst and a tailgut cyst. Although the nerve plexus was not clear and the epithelium was not a glandular epithelium, which was not typical as a duplication cyst, the above diagnosis was made because the thickening of the muscular layer was conspicuous to make it a tailgut cyst.

The postoperative course was uneventful except for an occurrence of paralytic bowel obstruction. The patient was discharged 27 days after surgery, and she has remained in excellent health so far for a year and 5 months.

3 | 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 Iyer et al. reported 5 cases (17.2%) of rectal duplications among 29 patients of gastrointestinal duplication.⁷ Kizilcan et al. reported an incidence of rectal duplication as well, and it comprises only 1% to 8% of all cases of gastrointestinal duplication,

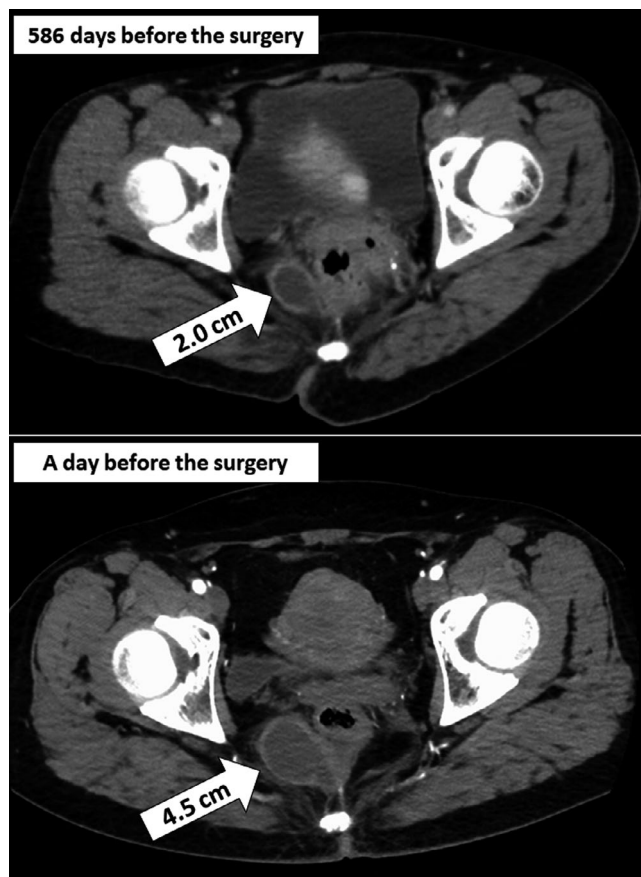


FIGURE 1 Axial CT, duplication cyst on right with wide communication with rectum (Arrow), and confirmed its enlargement

FIGURE 2 MRI image (Sagittal T1-weighted and axial) shows the well-defined, thin-walled cyst with intermediate signal intensity. The cyst appeared continuous with the rectal wall (Arrow)

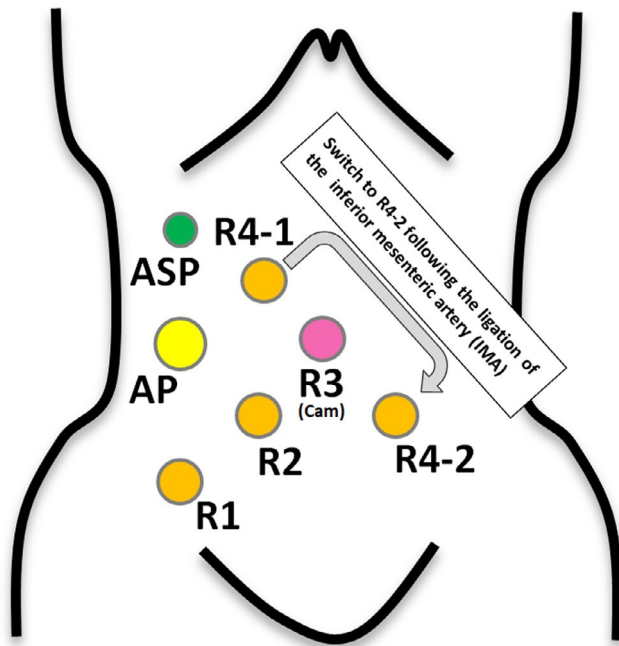
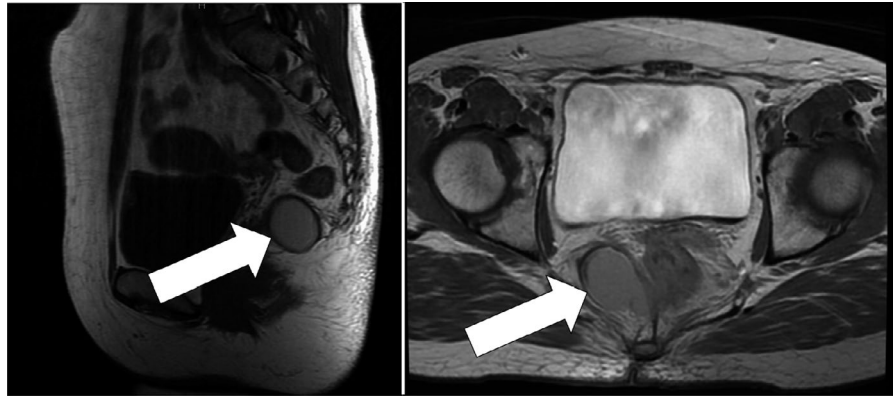


FIGURE 3 da Vinci[®] Xi™ port layout. R3, 8 mm camera port; ASP, 5 mm Air Seal port; AP, 12 mm assistant port; R1, 8 mm robotic arm#1; R2, 8 mm robotic arm#2; R4-1 and R4-2, 8 mm robotic arm#3; In order to focus on the manipulation in the pelvis, switch from R4-1 to R4-2 following the ligation of the inferior mesenteric artery (IMA)

which is relatively rare.⁸ 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, some cases were reported as gastrointestinal duplication even if all three conditions were 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 overlapping tubular intestines, but the rectum has many spheres. It is said to occur frequently in the posterior wall of the rectum.

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.^{9,10} Overlapping ureters, bladder malformations, fistulas with the urethral system, and pyuria may be present.⁹ There are also cases of multiple intestinal infections and bleeding. The epithelium of duplication cyst is usually the colonic mucosa,¹¹ but in rare cases, ectopic gastric mucosa may be present.¹² It causes ulcers and bleeding.

Surgical resection is the primary 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 performed. More recently, transanal endoscopic microsurgery (TEM) and laparoscopic intraabdominal approaches have been described.^{13,14} TEM has been described in two adult patients with posterior rectal duplication cysts with no evidence of malignancy. There is also a report that malignancy is observed when asymptomatic progresses despite the presence of ectopic gastric mucosa.¹⁵ We chose robot-assisted rectal resection as the surgical procedure.

4 | 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.

In this case, a large cyst was occupying the pelvis, and it should have been difficult to operate without the robot's assistance because the field of view was poor. When removing large cysts in the pelvis, robot-assisted surgery

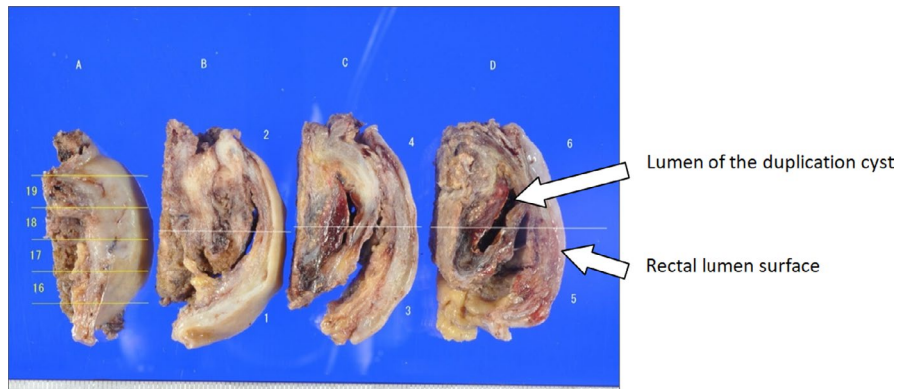


FIGURE 4 Macroscopic finding of the resected specimen revealed a 4 X 4.5 cm cystic component behind the rectal wall. There was no continuity with the rectal lumen

enables to secure the surgical field and perform smooth forceps operations in a relaxed state.

ACKNOWLEDGEMENTS

The authors would like to gratefully thank everyone who was involved in this work.

CONFLICT OF INTEREST

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

AUTHOR CONTRIBUTION

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

ETHICAL APPROVAL

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

CONSENT

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

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

ORCID

Masaki Kitazono  <https://orcid.org/0000-0001-9298-0189>

REFERENCES

- Ladd WE, Gross RE. Duplications of the alimentary tract. *South Med J*. 1937;30:363.
- Castro-Poças FM, Araújo TP, Silva JD, Gonçalves VS. Endoscopic ultrasonography and rectal duplication cyst in an adult. *Endosc Ultrasound*. 2017;6(5):336-339.
- Mouzakis O, Korovesis G, Georgiadis P, Piagou M, Filippou D, Skandalakis P. Adenocarcinoma arising in a rectal duplication cyst with distant metastasis A case report and a review of the recent literature. *Ann Ital Chir*. 2018;7:S22392 53X18027937.
- Flint R, Strang J, Bissett I, Clark M, Neill M, Parry B. Rectal duplication cyst presenting as perianal sepsis: report of two cases and review of the literature. *Dis Colon Rectum*. 2004;47(12):2208-2210.
- La Quaglia MP, Feins N, Eraklis A, Hendren WH. Rectal duplications. *J Pediatr Surg*. 1990;25(9):980-984.
- Puligandla PS, Nguyen LT, St-Vil D, et al. Gastrointestinal duplications. *J Pediatr Surg*. 2003;38:740-744.
- Iyer CP, Mahour GH. Duplications of the alimentary tract in infants and children. *J Pediatr Surg*. 1995;30:1267-1270.
- Kizilcan F, Tanyel FC, Kale G, et al. Duplication of the rectum resembling a juvenile polyp. *Turk J Pediatr*. 1992;34:193-195.
- Casteels A, Lenoir P, Vandenplas Y. Rectal duplication cyst. *J Pediatr Gastroenterol Nutr*. 1995;20:443-444.
- Carvalho F, Pereira F, Enes C. Cystic duplication of the rectum: report of two clinical cases. *Eur J Pediatr Surg*. 1998;8:170-173.
- Rajah S, Ramanujam TM, Anas SR, et al. Duplication of the rectum: report of four cases and review of the literature. *Pediatr Surg Int*. 1998;13:373-376.
- Khushbakht S, ul Haq A. Rectal duplication cyst: a rare cause of rectal prolapse in a toddler. *J Coll Physicians Surg Pak*. 2015;25(12):909-910 12.
- Hartin CW Jr, Lau ST, Escobar MA, Glick PL. Laparoscopic excision of a newborn rectal duplication cyst. *J Pediatr Surg*. 2008;43(8):1572-1574.
- Ben-Ishay O, Person B, Eran B, Hershkovitz D, Duek DS. Rectal duplication cyst in adults treated with transanal endoscopic microsurgery. *Tech Coloproctol*. 2011;15(4):469-471.
- Springal RG, Griffiths JD. Malignant change in rectal duplication. *J Royal Soc Med*. 1990;83:185-187.

How to cite this article: Kitazono M, Fujita M, Oyama T, et al. Robot-assisted excision of rectal duplication cysts: A case report. *Clin Case Rep*. 2022;10:e05457. doi:[10.1002/ccr3.5457](https://doi.org/10.1002/ccr3.5457)