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CASE REPORT PEER REVIEWED | OPEN ACCESS

Mucinous cystadenoma of the appendix resected by laparoscopic operation with non-touch isolation

Akihiro Koizumi, Hajime Orita, Tomoyuki Kushida, Mutsumi Sakurada, Hiroshi Maekawa, Ryo Wada, Koichi Sato

ABSTRACT

Introduction: Mucinous cystadenoma of the appendix is a rare condition that occurs from the storing of mucin in appendix. We describe a case of successful treatment by laparoscopic resection done very simply without rupture by using linear staple. This patient was discharged after five postoperative days without event. We tried to do non-touch operation with linear stapler. We strongly suggest this technique should become more popular around the world. Case Report: A 70-year-old woman was referred to our hospital with appendiceal swelling which was incidentally discovered by CT scan. CT scan indicated 4 cm in-sized vermiform mass arising from cecum with hypodense cystic structure and calcification on edge without any malignant features. Under preoperative diagnosis of benign tumor, we performed laparoscopic appendectomy safely and rapidly with an endoscopic linear stapler. Depending on the surgical pathology, we made sure the stump was negative and there was no malignancy. The final pathological diagnosis also was mucinous cystadenoma of the appendix. This patient was discharged after five postoperative days without any event. Conclusion: We recommend doing two step-operation for avoiding complications and to do minimum invasive surgery for this type of benign-like mucinous cystadenoma. In this case, we succeeded in non-touch operation with linear stapler.

Keywords: Appendectomy, Appendix, Mucinous cystadenoma

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INTRODUCTION

Mucinous cystadenoma of the appendix is rare condition that occurs from the storing mucin in the vermiform appendix. It is observed in 0.2 to 0.6% of appendectomy specimens [1, 2]. Villous adenomatous changes of the appendix epithelium are caused by mucin-secreting cells. This disease has two big major complications: its own possibility of malignancy and the risk of gelatinous disease of the peritoneum (peritoneal pseudomyxoma) in the event of perforation, which occurs in 10 to 15% of the cases [2].

Recently, laparoscopic approach is becoming more common and conventional since a large incision for exploration of the peritoneal cavity can be avoided, which

allows the advantage of minimally invasive surgery [3, 4].

Drawing on our past two case experiences [5], we describe a successfully treated case of simple laparoscopic resection without rupture by using linear staple. This operating technique appears to be gaining in popularity.

CASE REPORT

A 70-year-old woman was referred to our hospital with appendiceal swelling which was incidentally discovered by CT scan, during malignancy lesion retrieval process with high ANCA score. She had multiple vasculitis and her ANCA score was very high score (1340 U). The patient had no other significant features. CT scan indicated 4cm in-sized vermiform mass arising from cecum with hypodense cystic structure and calcification on edge (Figure 1A). There was no malignant feature. Under preoperative diagnosis of mucinous cystadenoma of the appendix (benign), after referring to the previous two cases, we considered doing this operation much more simply by performing laparoscopic appendectomy. Due to possibility of malignancy, we immediately ordered surgical pathology after resection. With the patient in the supine position, pneumoperitoneum was established with the open technique, and four trocars were placed. Laparoscope port was placed in the navel region. Other ports were in the upper, lower, left and right abdomen. The mass was removed along with the appendix.

Surgical technique

Under general anesthesia, the patient was placed in the supine position. Camera port was inserted through a 3.0 cm transumbilical incision and four 5mm ports were inserted in both lateral abdominal cavities. At first observation of the abdominal cavity there were no other special feathers except for swollen yellow appendix (Figure 2A).

Firstly, appendix artery was divided holding mesoappendix, rather than the tumor directly (Figure 2B). After dissection of mesoappendix tissue from retro peritoneal (Figure 2C), vermiform mass was transected safely and rapidly with an endoscopic linear stapler (Figure 2D and 2E). Swollen appendix was resected and embraced without directly touching it rather than ileocecal resection (Figure 1B). Depending on the surgical pathology, we made sure the stump was negative and no malignancy (Figure 2E). Though total operation time was 1 h 53 min, including setting time and dividing of adhesion, real resection time was only 30 minutes. The mucinous cystadenoma of the appendix resected by laparoscopic operation with non-touch isolation. The final pathological diagnosis also was mucinous cystadenoma of the appendix (Figure 1C). This patient was discharged after five postoperative days without event.

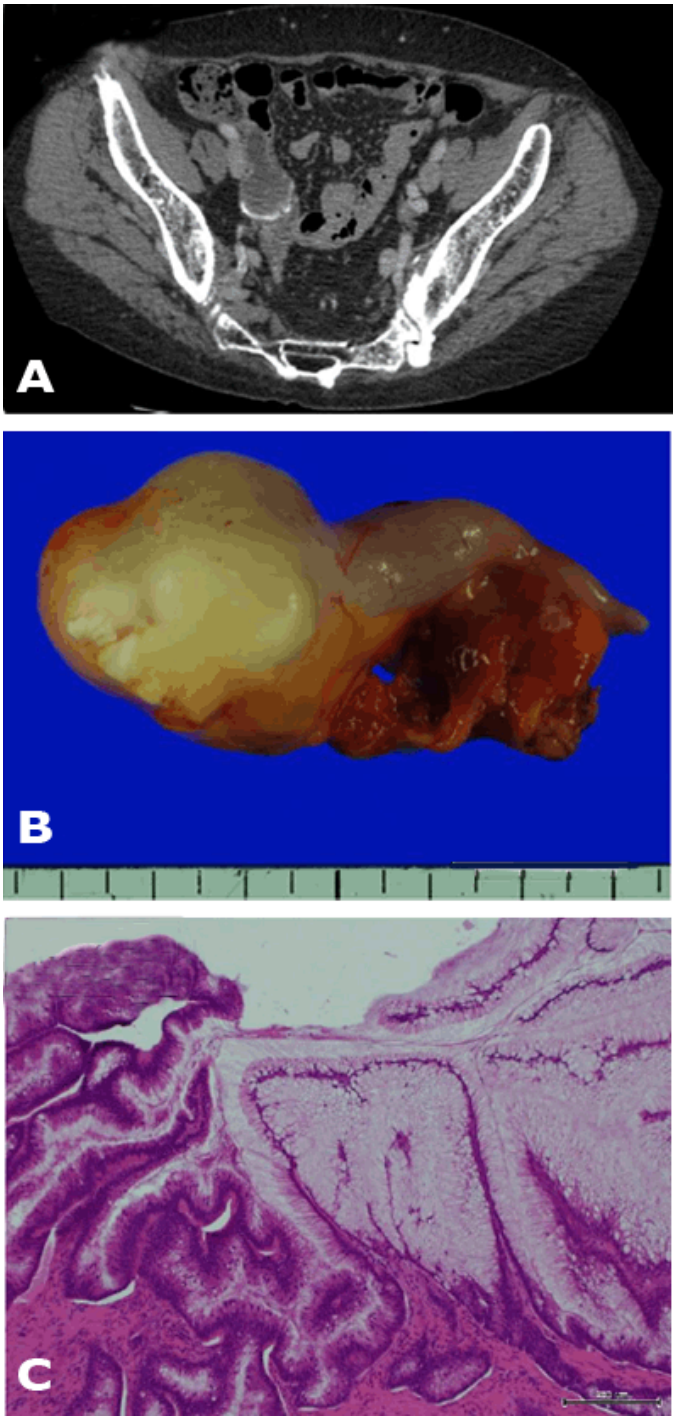

Figure 1: (A) CT scan showed 4cm in-sized appendix with hypodense cystic structure and calcification on edge. (B) The resected 6 cm in sized swollen mucinous tumor with fat tissue. (C) There was a part of tubular villous adenoma component inside of mucoid cyst by microscopic examination. No malignant cells were identified. (Hematoxylin and eosin staining; original magnification x100)

DISCUSSION

Mucinous cystadenoma of the appendix is rare lesions with no typical symptoms [1, 2]. Expanded appendix with mucin rarely presents right lower abdominal pain; the

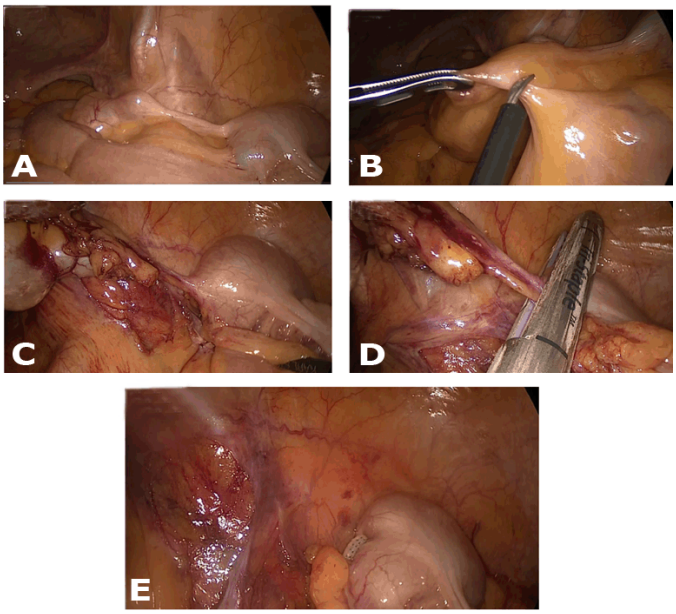

Figure 2: (A) The swollen appendix on the observation of laparoscopy. (B) Appendix artery was divided holding mesappendix, not tumor directly. (C) Dissection of mesappendix tissue from retro peritoneal. (D) and (E) vermiform mass was transected safety and rapidly by an endoscopic linear stapler.

same as an acute appendicitis. It is usually discovered incidentally on imaging, or during operations, and is asymptomatic [4, 5]. The cystadenocarcinoma is very rare and there is no useful preoperative examination without pathological diagnosis, in order to avoid inappropriate treatment.

The mean age for its occurrence, predominantly in women, is 50 to 60 years [6]. This type of tumor was found in 0.2 to 0.6% of appendectomy specimens [1, 2].

This disease has two big complications, its own possibility of malignancy and pseudomyxoma peritonei. Malignancy causes have the possibility to progress and metastasize [7]. These mucinous malignant cells are more likely to disseminate throughout the peritoneal cavity [8]. Even in a benign disease, dissemination of mucin-producing cells into the peritoneal cavity would cause pseudomyxoma peritonei [7]. Pseudomyxoma peritonei cause poor prognosis statement. Mucin not only fills the abdominal cavity, but also the omentum, bowel, spleen, ovary and myometrium may become invaded [9, 10]. It is important to remove it without trauma [2].

Preoperative diagnosis of malignancy or not is very important for the selection of an adequate surgical method to prevent peritoneal dissemination and operative complications. There are no typical symptoms, most cases were inadvertently found by chance by Computed Tomography (CT). CT is reported as the most accurate method of diagnostics [11]. CT can be used to discover the signs specific to cystadenoma with high accuracy: appendix lumen and wall calcification.

Depending on CT and other modalities, we diagnosed this tumor non-malignant. We planned 2 step operations, 1st non-touch resection of this tumor then immediately check the surgical pathology. If malignancy was suspected, we would plan to open ileocecal resection.

Previously our group reported 2 successful laparoscopic resection cases, folding gauze around the tumor and using a rap disk to transport the specimen through the abdominal wall to avoid the tissue dropping [5]. Because it is difficult to diagnose the tumor as benign, many cases are performed by ileocecal resection or that undershoot [3]. By laparoscopic operation, the surgeon needs to fold the ileocecal under that procedure.

Japan Medical Abstract society had 164 cases of appendicealmucocele in the past 5 years. 131 cases of cystadenoma of appendix and 36 cases of cyst adenocarcinoma were reported. Six of them turned into peritoneal Pseudomyxoma.

We tried to avoid the risk of the recrudescence and that of dropping mucin cell by operating in a non-touch way. For benign likely cases, we used a two stepoperation to avoid these risks. In this case the tumor seemed to be obviously benign; therefore in order to carry out a successful non-touch operation, we folded only the root of appendix, and amputated it simply and safely, using a Linear stapler. As this procedure, the first attempt and done carefully the operating time took slightly longer than usual. We are certain we can do this technique simply and safely by scopic surgeons in the future.

CONCLUSION

In conclusion, cystadenoma of appendix is a rare disease. A correct diagnosis before surgery is very important for selecting the best surgical technique and avoiding severe intraoperative and postoperative complications.

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Author Contributions

Akihiro Koizumi – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Hajime Orita – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
Tomoyuki Kushida – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published
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Koichi Sato – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor of Submission

The corresponding author is the guarantor of submission.

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Consent Statement

Written informed consent was obtained from the patient for publication of this case report.

Conflict of Interest

Authors declare no conflict of interest.