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Appendicular Mucocele with Robotic Partial Typhlectomy and Correction of Rectus Abdominal Muscles' Diastasis: A Case Report

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Abstract

Low-grade appendiceal mucinous neoplasm (LAMN) is rare, and patients are often asymptomatic or have nonspecific symptoms. Appendicectomy should be performed with care and limited handling of the appendix, with extraction of the specimen through an extraction bag to prevent perforation and spillage of mucin, which can result in the development of pseudomyxoma peritonei (PMP). This case report aims to shed light on the approach to appendicular mucocele in contemporary medicine. The reported case shows a presentation of mucocele in a young female patient with symptoms compatible with appendicitis. This case report serves as an example of how to diagnose, manage, and follow-up on appendicular mucocele treatment for colleagues who may encounter similar conditions.

Keywords

Appendicular Mucocele, LAMN, Diagnosis, Treatment

1. Introduction

LAMN is a tumor of the appendix that carries a risk of serious complications. There is a slight predominance of females, and it is most observed after the age of 50 years [1] [2].

The symptomatology of the appendicular mucocele is vague; therefore, most patients are asymptomatic or present with nonspecific symptoms [1] [2] [3] [4]. The most common symptom is abdominal pain in the right lower quadrant,

specifically found in the right iliac fossa, making it appear to be a case of appendicitis or gynecological pathologies, such as an anexal mass. This makes the diagnosis complex and often late or incorrect [1] [2] [3] [4].

Since it is an uncommon pathology with an atypical clinical presentation, it is often discovered incidentally through imaging tests and intraoperatively [2] [3] [4].

The imaging tests used for the diagnosis of LAMN are abdominal ultrasonography (USG) and computed tomography (CT) [1] [2] [3]. The characteristics that indicate the presence of LAMN at USG are an "onion skin" appearance, which is a cyst with mucinous content inside, multiple echogenic layers, nodular enhancement of the wall, and calcification of the wall [1] [2] [3]. At CT, which is considered the superior imaging exam, with an accuracy rate of 89.7% [1], it presents a well-delimited cystic mass with low attenuation, variable wall thickness, and, in 50% of cases, curvilinear mural calcifications [2] [3] [4].

Magnetic resonance imaging (MRI) can show a hyperintense distended appendix and bright mucin appearance on T2-weighted MRI, as well as nodularity on MRI with contrast.

Surgical removal of the appendix is crucial for further diagnosis and management to reduce risks of rupture and pseudomyxoma peritonei progression and examine for the presence of LAMN pathologically [1].

2. Case Report

A 39-year-old female patient presented with a complaint of bulging in the umbilical region and rectus abdominis diastasis. She sought medical attention for herniorrhaphy and correction of diastasis. She denied having any comorbidities or other symptoms. Physical examination revealed a painless abdomen with a reducible bulging suggestive of umbilical hernia and rectus abdominis diastasis. An abdominal tomography was performed for surgical planning, which revealed a hypodense formation with liquid content and associated punctiform calcifications located in the cecal appendix, in the right iliac fossa, measuring 2.2 cm, suggestive of an appendicular mucocele (**Figure 1**). Diastasis of the rectus abdominis muscles in the epigastrium/mesogastrium of up to 5.8 cm, extending to about 23 cm and umbilical hernia signs.

In view of the findings, robotic partial typhlectomy, correction of rectus abdominis diastasis and umbilical herniorrhaphy were indicated.

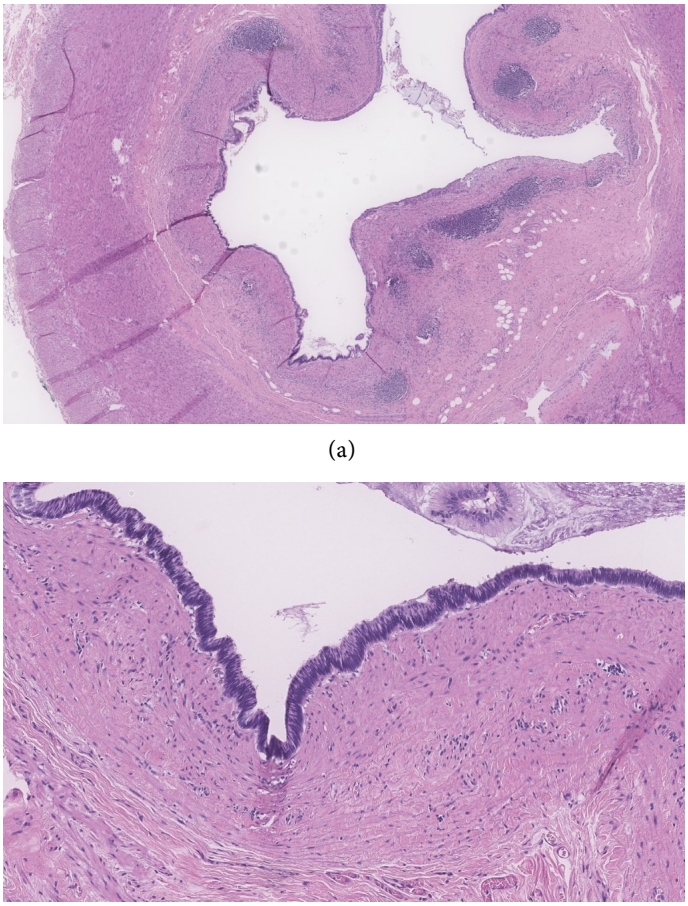
The patient was indicated for robotic partial typhlectomy, correction of rectus abdominis diastasis, and umbilical herniorrhaphy based on the findings. Three punctures ranging from 8 to 12 mm were made on the left flank and one suprapubic puncture on the topography of the cesarean scar. The da Vinci XI robot was coupled, and the thickened cecal appendix was identified, and careful dissection with scissors began. Due to the presence of enlarged lymph nodes near the mesoappendix, it was decided to perform lymphadenectomy and partial typhlectomy (**Figure 2**). The surgical specimen was sent for freezing and was found to have free margins.

Figure 1. CT of the abdomen showing the mucocele of the cecal appendix.

Figure 2. Cecal appendix and part of the cecum, both intact.

After opening the peritoneum, the diastasis was corrected with a scarp thread along its entire length, and umbilical herniorrhaphy was performed. A monofilament polyester mesh with a collagen film was used to cover the diastasis, and it was fixed with separate stitches due to the extension of the diastasis. The peritoneum was closed, and the robotic arms were removed. The patient recovered uneventfully and was discharged on the 3rd postoperative day.

The anatomopathological result of partial colectomy and lymphadenectomy indicated that the tumor was a low-grade mucinous neoplasm (LAMN) according to the WHO classification, with a well-differentiated histological grade (G1). The surgical specimen was intact, and the tumor was located in the middle third of the cecal appendix, measuring 6 mm in the longest axis. The tumor had infiltrative extension with cellular mucin reaching the visceral peritoneum (serosa) and superficial extensive growth (**Figure 3(a)** and **Figure 3(b)**). The boundaries of the surgical resection were free of neoplasia, without lymphovascular invasion or perineural invasion. Additional morphologic findings included fibro-obliterative appendicopathy. The pathological staging (pTNM, AJCC 8th Edition) was pT3.



(a)

(b)

Figure 3. (a) and (b): Histological sections with hematoxylin and eosin demonstrating low grade mucinous neoplasm, with a well differentiated histological grade and the infiltrative extension.

3. Discussion

Mucocele cases are rare, ranging from 0.2% - 0.4% of appendectomies performed, corresponding to 0.2% - 0.5% of all gastrointestinal tract tumors and approximately 1% of colorectal neoplasms [1] [4]. The mean age at diagnosis is 55 years, with a 4:1 female predominance [3]. They are usually asymptomatic lesions and can be diagnosed by chance during routine exams or as an incidental finding during a surgical procedure. There is a risk of accidental intraoperative rupture of the appendix, so extreme care is recommended in its handling to avoid intraperitoneal dissemination of a mucin-producing malignant tumor [5].

CT is a more accurate imaging method for the diagnosis of appendiceal mucinous neoplasms and shows a cystic mass closely adjacent to the cecum, with a round or long tubular shape, thin wall, and a smooth and regular outline, suggesting LAMN.

MRI performed with a variety of sequences and scanning methods and high tissue resolution can clearly and consistently distinguish the wall and fluid of the appendiceal mucinous cyst and more accurately show the integrity and boun-

dary of the cyst wall.

Surgery is still the only treatment option for appendiceal mucinous neoplasms. Iatrogenic rupture of the tumor should be avoided during surgery to reduce the risk of implantation metastasis and disease recurrence [6] [7].

Resection is recommended when identified (whether incidentally or not) due to the potential for the mucocele to harbor a neoplasm. It is imperative during resection to avoid rupture of the mucocele and potential spillage of mucin in the peritoneal cavity, which can result in pseudomyxoma peritonei with associated morbidity and mortality [3].

Careful use of robotic graspers and the absolute use of an endobag during extraction are important maneuvers during robotic surgery. In considering the extension of the surgical treatment, the base of the appendix should be carefully assessed during the operation [7].

Robotic-assisted surgery allows for improved dexterity, with wrist-like motion of the instruments and a three-dimensional camera, offering the potential for safer resection.

In the case in question, the patient was informed that we would only correct the abdominal diastasis if there was no need to expand the margin by performing a colectomy and primary anastomosis [5]. The specimen removed had free margins, so there was no contamination of the cavity, and we set out to correct the abdominal diastasis. The correction of diastasis with the help of a robot facilitates the restoration of the functional part of the abdominal wall, with an excellent aesthetic result, without rapid recovery, and avoiding major abdominal cuts and drains, usually used in conventional abdominoplasty surgery.

The patient had no other complications, maintaining her follow-up with both the surgical team and oncology team, with no need to have any chemo or radiotherapy.

Informed consent was obtained from the patient prior to writing this case report.

4. Conclusion

Minimally invasive approaches to appendicectomy, specifically the robotic-assisted approach and the hand-assisted laparoscopic approach, can be considered for safe resection of appendiceal mucoceles.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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