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Case Report

Robotic assisted excision of a mesenteric cyst of Müllerian origin in a 29-year-old woman

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ABSTRACT

Mesenteric cysts are rare, benign tumors of uncertain etiology that require management. The Müllerian subtype of one of the rarer types of mesenteric cysts. Diagnosis of a mesenteric cyst typically involves nonspecific symptoms or an asymptomatic presentation. Treatment involves resection to prevent life-threatening complications. Resection through laparotomy surgery is the most common approach. The laparoscopic approach is gaining traction. We present a case in which a large mesenteric cyst was resected using a robotic assisted laparoscopic approach.

Keywords: Mesenteric cyst, Mullerian cyst, Laparoscopic enucleation, Minimally invasive surgery

INTRODUCTION

Mesenteric cysts are rare, benign tumors of uncertain etiology that present in 1/250,000 hospital admissions.[1] These cysts are found in the mesentery or omentum of the GI tract. They are more commonly located in the small intestine (82% of cases).[2] These cysts may grow large in size, with some reaching 30 cm.[3] The most common presenting symptom of mesenteric cysts is abdominal pain, although they may be discovered incidentally.[4] Given their potential to be in any part of the mesentery, mesenteric cysts have a wide array of differentials. They may be histopathologically classified as having a lymphatic origin, mesothelial origin, enteric origin, or urogenital origin or as a mature cystic teratoma or a pseudocyst.[5] Mesenteric cysts of urogenital origin may be further classified into subtypes pronephric, mesonephric, metanephric, and müllerian.[2] Diagnosis of mesenteric cysts can be difficult, however, treatment via resection of these often massive cysts is essential to avoid complications.[6] This case report described a successful robotic assisted resection of a large mesenteric cyst without complications.

CASE REPORT

A 29-year-old woman presented to the ED with gradually worsening intermittent RUQ abdominal pain for one week without other symptoms like nausea, vomiting, diarrhea, and fever. The patient had a blood pressure of 126/78, a heart rate of 73 bpm, a respiratory rate of 18 breaths/minute, and a BMI of 34.7. The patient's labs were unremarkable including a WBC 9.6 and Hb 13.2. The patient had no prior surgeries. A limited right upper quadrant ultrasound showed no significant findings. A subsequent CT abdomen and pelvis revealed an 8.6×8.5×13.1 cm unilocular fluid density structure in the right lower quadrant with no solid or enhancing component distinct from the appendix and the right ovary. Tumor markers LDH, AFP, CA19-9, CEA, and CA125 were within acceptable ranges.

The patient underwent a robotic assisted mesenteric cyst excision two weeks after ED presentation. The cyst was found in the right adnexal area but distinct from the right ovary, fallopian tube, cecum, and appendix. It was excised intact after controlled aspiration of clear cystic

fluid. Pathology results were consistent with a mesenteric cyst of Müllerian origin. The patient recovered without complications and was discharged on the following day.

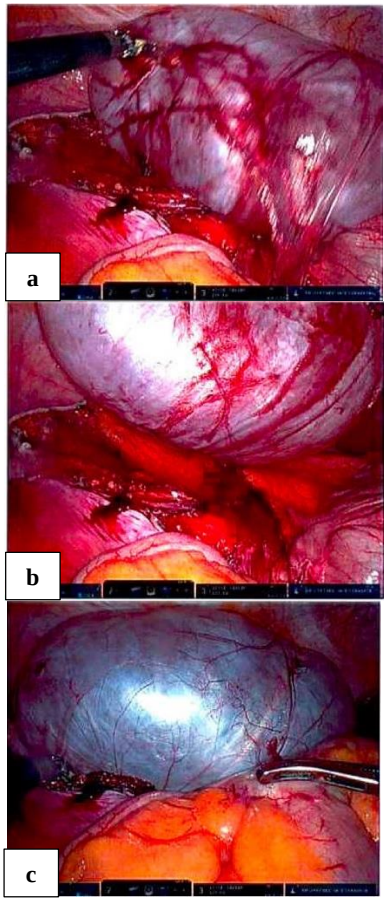

Figure 1 (a-c): Intraoperative images of the dissected mesenteric cyst.

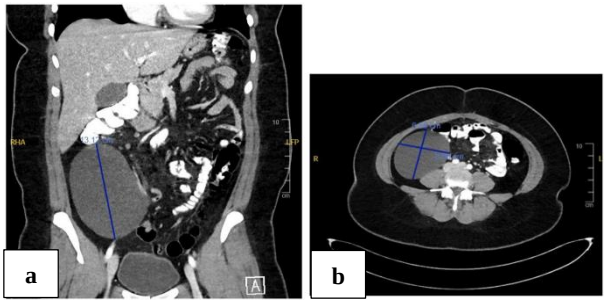

Figure 2: CT abdomen in (a) coronal and (b) axial planes that show the location of the mesenteric cyst in the RLQ of the abdomen.

DISCUSSION

Mesenteric cysts may be classified based on histopathologic characteristics as having a lymphatic origin, mesothelial origin, enteric origin, or urogenital origin, or being mature cystic teratoma or nonpancreatic pseudocysts.[2] Mesothelial and lymphatic origin are the most common types of mesenteric cysts.[2] More infrequently encountered are those of urogenital origin, which may further be classified into the pronephric, mesonephric, metanephric, and müllerian subtypes.[2] These are formed from urogenital remnants, such as the Wolffian and Müllerian ducts.[2] Given the location of urogenital organs, mesenteric cysts of urogenital origin tend to form closer to this region in the abdomen.[2] This subtype is identified histologically by a lining of ciliated cuboidal or low columnar cells with partial lining of smooth muscle bundles, adipose tissue, lymphovascular spaces, and lymphocytic aggregates.[7]

Müllerian cysts form from the caudal Müllerian ducts.[8] These ducts develop into the uterus, superior vagina, and ovaries in females.[8] In males, they are most commonly found in the prostate and seminal vesicles.[8] Rarely, Müllerian cysts have been reported in the mesentery, such as in our case. It has been proposed that the proximity of the cecum and reproductive tract during around the fourth to the twelfth week of embryonic development may explain this rare presentation.[8]

Mesenteric cysts, even those of large size, are often asymptomatic or present with nonspecific symptoms.[1] The most common symptom, abdominal pain, presents in 55%-81% of patients.[4] Less commonly, they may present with distention, nausea, vomiting, diarrhea, or a palpable mass.[4] It is important to note that the abdominal tenderness may be located in a different quadrant from the cyst location, just as in our case.[4] Epidemiologic factors to consider include the five times increased prevalence in children and a 2:1 female-to-male ratio.[4]

Given the nonspecific and wide ranging presentations, diagnosis may be hindered. In one case, a mesenteric cyst presenting with abdominal distension and constipation presumed to be massive ascites based on physical exam and abdominal ultrasound was diagnosed after 7 years.[9] Differential diagnoses also include mucinous cystic neoplasm of the mesentery, multicystic peritoneal mesothelioma, pseudomyxoma peritonei, and peritoneal hydatidosis.[10]

Early diagnosis and treatment are critical due to possible life threatening complications, such as infection, rupture with peritonitis, volvulus, bowel obstruction, obstructive uropathy, and transformation to malignancy in 3%.[4,11] Complications may vary depending on size and location.

Complete excision with possible bowel resection through laparotomy surgery is the most common approach for treating mesenteric cysts.[12] Marsupialization is a second line approach.[1] Partial excision and drainage are associated with increased recurrence and mortality rates.[11] The laparoscopic approach for resection has increased in recent years, as it offers a minimally invasive approach with a shorter hospital course and less postoperative pain.[13] It also involves smaller surgical scars, which likely decrease the risk of infection. In a 2020 case series on four laparoscopic mesenteric cyst

excisions, all four were successfully removed with no recurrence, including one adjacent to the pancreatic tail requiring a distal pancreatectomy.[14] The robotic approach is being used more often for abdominal procedures. A retrospective analysis of laparoscopic versus robotic assisted abdominal surgeries of 1,124,450 patients demonstrated an increased cost of robotic surgeries through all procedure types.[15] However, this analysis also demonstrated that abdominal robotic surgery had a 0.7 day decrease in length of stay and a 2.2% lesser complication rate, showing the potential benefit of robotic assisted abdominal surgeries to decrease the overall long term cost of using robotic surgery.[15]

Both laparoscopic and robotic assisted surgeries may undergo conversion to an open approach. It has been demonstrated that an advantage of robotics compared to the laparoscopic approach in abdominal surgery is the decreased conversion to open surgery secondary to abdominal adhesions in patients with previous abdominal surgeries.[16] In a retrospective study of robotic assisted mesenteric cyst removal in 12 pediatric patients, all were performed without conversion.[6] Additionally, none of the patients experienced peritoneal infection, anastomotic leak, or recurrence.[6] Our patient underwent robotic assisted surgical resection rarely described in mesenteric cyst resection in adults.

CONCLUSION

Mesenteric cysts are rare benign tumors that should be kept in the differential diagnosis of abdominal masses. Surgical resection is the treatment of choice and was in the past done through an open approach, an exploratory laparotomy, but minimally invasive approaches are now preferred. Robotic assistance provides a less invasive avenue with benefits such as increased precision and dexterity. As the technological advancements in surgical robotics continue to progress, it is probable that the robotic approach will outpace nonrobotic assisted laparoscopy for many procedures, including the removal of mesenteric cysts.

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