Hand-Assisted Laparoscopic Surgery for a Mesenteric Teratoma

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ABSTRACT

Mature cystic teratomas are benign neoplasms of germ cell tumors that occur most frequently in gonadal sites. The tumors usually contain 2 or 3 well-differentiated elements of endodermal, ectodermal, and mesodermal origin. Although relatively uncommon, teratomas can be composed of mature tissue originating from only 1 germ cell layer. This is known as a monodermal teratoma.

Extragonadal teratomas, especially mesenteric teratomas, are extremely rare. Currently, only 21 cases of mesenteric teratoma have been described in the English literature. Mesenteric teratomas are rarely diagnosed preoperatively because pathological examination is necessary to make a definitive diagnosis.

We herein report a rare case of mesenteric monodermal teratoma and review the literature. To the best of our knowledge, this is the first case of mesenteric teratoma treated with hand-assisted laparoscopic surgery.

Key Words: Hand-assisted laparoscopic surgery, Laparoscopy, Mature cystic teratoma, Mesenteric cyst, Ovarian cyst.

INTRODUCTION

Mesenteric cysts are rare abdominal tumors, with a reported incidence of 1 of 27,000 to 1 of 100,000 admissions. Mesenteric cysts are classified into 6 groups based on their clinical and histopathological features. Previously, only 21 cases of mesenteric teratoma have been described in the English literature. Although mesenteric teratomas can be treated with either laparotomy or conventional laparoscopic surgery, there are no cases of such rare tumors being treated with hand-assisted laparoscopic surgery (HALS). We herein report a rare case of mesenteric monodermal teratoma that was successfully treated with hand-assisted laparoscopic resection of the ileum.

CASE DESCRIPTION

A 30-year-old woman (gravida 0, para 0, body mass index: 19.2 kg/m²) presented with chronic pain in the lower abdomen and was hospitalized for investigation and treatment. A transvaginal ultrasound showed a large cystic mass posterior to the uterus. Magnetic resonance imaging revealed a monolocular pelvic cyst measuring approximately 10 × 8 × 8 cm (Figure 1). There were no clinical findings possibly suggestive of malignancy such as solid component, wall thickness, and necrosis with the tumor. Magnetic resonance imaging did not visualize the left ovary. The serum cancer antigen 125 level was 61.5 U/mL (standard value: <35 U/mL). The serum l-lactate dehydrogenase, carcinoembryonic antigen, and cancer antigen 19-9 levels were within the normal limits. The differential diagnosis included serous cystadenoma or mucinous cystadenoma of the left ovary. The patient underwent laparoscopic surgery. She was placed in the lithotomy position under general anesthesia and was hospitalized for investigation and treatment. A transvaginal ultrasound showed a large cystic mass posterior to the uterus. Magnetic resonance imaging revealed a monolocular pelvic cyst measuring approximately 10 × 8 × 8 cm (Figure 1). There were no clinical findings possibly suggestive of malignancy such as solid component, wall thickness, and necrosis with the tumor. Magnetic resonance imaging did not visualize the left ovary. The serum cancer antigen 125 level was 61.5 U/mL (standard value: <35 U/mL). The serum l-lactate dehydrogenase, carcinoembryonic antigen, and cancer antigen 19-9 levels were within the normal limits. The differential diagnosis included serous cystadenoma or mucinous cystadenoma of the left ovary. The patient underwent laparoscopic surgery. She was placed in the lithotomy position under general anesthesia, and a pneumoperitoneum of 10 mm Hg was established using the closed method. The surgeon stood on the left side of the patient and created a 2.5-cm incision at the umbilical base. The surgeon then proceeded to expose the rectus fascia and placed 3 trocars (each 5 mm in diameter) in the fascia. An assistant surgeon stood on the right side of the patient, inserted a 5-mm rigid scope with a 30° angle through the 5-mm umbilical port, and manipulated the scope with the left hand to secure the view during surgery. During the laparoscopic surgery,
the patient was noted to have a large mesenteric cyst located 5 cm from the end of the ileum (Figure 2) with grossly normal-appearing ovaries bilaterally. We initially attempted to perform laparoscopic resection of the cyst. However, a dense adhesion between the cyst and the ileal serosa was observed. Therefore, we decided to convert to HALS. An extra small wound retractor (Alexis, Applied Medical, Rancho Santa Margarita, California) was inserted into the umbilicus. A sterilized surgical glove was tightly attached to the cyst using quick-drying glue (Aron Alpha A, Sankyo, Tokyo, Japan) with careful attention not to spread it into the abdominal cavity. The cyst was punctured with a suction tube, and the cyst fluid was aspirated. After mobilizing the ileum and pulling it out of the abdominal cavity through the wound retractor, we performed partial resection of the ileum containing the cyst with functional end-to-end anastomosis while tightly clamping the punctured site to prevent spillage of cyst fluid remaining in the tumor. The total operative time was 183 minutes and the estimated intraoperative blood loss was <50 mL. The pathologic diagnosis was mesenteric monodermal teratoma. The cyst wall was composed of respiratory-type ciliated epithelial cells (Figure 3). The patient was uneventfully discharged on postoperative day 9. She was found to be doing well during the postoperative follow-up period.

**DISCUSSION**

Mesenteric cysts are rare pathologic entities, with a reported incidence of approximately 1 of 27,000 to 1 of 100,000 admissions. They can occur in any segment of the mesentery, from the duodenum to the rectum. Fifty percent of mesenteric cysts are found in the small-bowel mesentery, half of which are found were in the ileal mesentery. Mesenteric cysts can be found at any age, including childhood and adulthood, and even during pregnancy. According to a review of the literature regarding mesenteric cysts conducted by de Perrot et al, children typically present with acute abdominal symptoms that may simulate appendicitis, while adults tend to have more indolent symptoms. The symptoms are variable, nonspecific, and include pain (82%), nausea and vomiting (45%), constipation (27%), and diarrhea (6%). Abdominal masses may be palpable in up to 61% of patients. Mesen-
Malignant forms of mesenteric cysts have been described previously, and the incidence of malignancy is reported to be less than 3%. To exclude enteric teratoma, mature cystic teratomas are commonly found in the ovaries. English-language articles on PubMed published by October 31, 2012, were searched using the key words or combinations of the key words “mature cystic teratoma,” “mesenteric teratoma,” “mesenteric cyst,” and “dermoid cyst” for all articles related to mesenteric teratomas. Only 21 cases of mesenteric teratoma have been previously reported. Of these 21 cases, we were able to obtain detailed information for 18 patients, as shown in Table 1. Mesenteric teratomas can occur at any age, from newborns to adult patients, the same tendency as that observed in the previously reported literature regarding mesenteric cysts. The tumor size is approximately 10 cm in most cases, indicating that mesenteric teratomas are undetectable unless they grow to a considerable size and cause the patient to present with various symptoms. However, even if the patient presents with abdominal complaints, it is often difficult to make a diagnosis of mesenteric teratoma in the preoperative period. Though computed tomography and magnetic resonance imaging examination are available, only 4 of the 21 patients (19%) with mesenteric teratomas were diagnosed before undergoing surgery.

The preoperative diagnoses in these patients include other common abdominal masses such as mesenteric teratomas misdiagnosed as ovarian cysts in 3 cases and as a parastatic cyst in 1 case. Two of the 21 patients (9.5%) were diagnosed with immature teratomas. This is a higher incidence of malignancy than that observed with mesenteric cysts (3%). Therefore, physicians should recognize the importance of possible malignancy when preoperative diagnostic imaging reveals fat-containing abdominal tumors. Complete surgical excision is the only method to distinguish mesenteric benign teratomas from other diagnostic possibilities.

Mesenteric cysts can be treated with either laparotomy or laparoscopic surgery. The selection of the surgical approach depends on the size of the cyst, the location within the abdominal cavity, and the skill of the surgeon. According to a systematic review regarding HALS in colorectal surgery, it has the advantages of mini-invasive procedures combined intracorporeal and extracorporeal procedures have been described. From Japan, Takeda et al and Kumakiri et al have introduced the utility of a double-balloon catheter (SAND Balloon, Hakko Medical, Tokyo, Japan) in gynecologic surgery. Watanabe et al has described another novel method with a sterilized surgical sheet attached to the cyst using quick-drying glue, which is very similar to our method using a surgical glove.

In our case, due to the presence of a dense adhesion between the cyst and the ileal serosa and the risk of rupture of the cyst in the abdominal cavity, we performed hand-assisted laparoscopic surgery. The fear of malignancy may be the main reason that the previously reported cases almost chose laparotomy over laparoscopic surgery. A major concern in laparoscopic surgery for large cystic tumor is the possibility of intraoperative spillage of potentially malignant fluid in the cyst. To overcome the problem, several novel techniques combined intracorporeal and extracorporeal procedures have been described.

CONCLUSIONS

We herein reported a rare case of a mesenteric monodermal teratoma mimicking an ovarian tumor. Surgeons should recognize the difficulty in correctly diagnosing a pelvic mass preoperatively or intraoperatively without the help of frozen section analysis or permanent pathological evaluation.
| Reference No. | Reported Year | Age | Sex | Tumor Size (cm) | Symptom | Preoperative Diagnosis | Type of Surgery Performed | Pathologic Diagnosis |
|--------------|---------------|-----|-----|----------------|---------|------------------------|--------------------------|---------------------|
| 7            | 1959          | 26 y | F   | 14 × 8         | Abdominal pain, nausea | Ovarian torsion, tubo-ovarian abscess | Laparotomy               | Mature cystic teratoma |
| 10           | 1984          | 13 y | M   | 15.5 × 17      | Abdominal pain         | —                        | Laparotomy               | Mature cystic teratoma |
| 11           | 1989          | 5 y  | F   | 10 × 8         | Nontender abdominal mass | —                      | Laparotomy               | Cystic teratoma       |
| 12           | 1993          | 10 y | F   | —              | —                      | —                      | —                      | —                   |
| 13           | 1995          | 8 mo | F   | 5.5 × 4.5 × 4.5 | Intractable diarrhea | —                      | Laparotomy               | —                   |
| 14           | 1997          | Newborn | M   | 6 × 5 × 5      | —                      | Mesenteric teratoma      | Laparotomy               | Immature teratoma     |
| 15           | 2001          | 28 y | F   | 6.5           | Abdominal pain, nausea, vomiting, dysuria | Cecal volvulus            | Laparotomy               | Mature cystic teratoma |
| 16           | 2002          | 2 y  | M   | 15 × 18        | Nonbiliary vomiting    | Intestinal obstruction  | Laparotomy               | Benign cystic teratoma |
| 18           | 2003          | 5 mo | F   | —              | —                      | —                      | —                      | —                   |
| 19           | 2003          | 68 y | M   | 18 × 10 × 6    | None                   | Mesenteric epidermoid cyst | Laparotomy               | Epidermoid cyst       |
| 20           | 2004          | 30 y | M   | 4              | Acute abdominal pain   | Mesenteric teratoma     | Laparotomy               | —                   |
| 21           | 2006          | 9 y  | F   | 3 masses (each 3 cm) | Abdominal pain, vomiting | Multiple mesenteric teratoma | Laparotomy               | Mature cystic teratoma |
| 22           | 2007          | 7 y  | F   | 15 × 15        | Abdominal pain, bilious vomiting, constipation | Ovarian mass              | Laparotomy               | Immature teratoma     |
| 23           | 2010          | 23 y | F   | 3.9 × 5.5 × 7.3 | Nontender abdominal mass | Mesenteric cyst            | Laparoscopy               | Mature cystic teratoma |
| 24           | 2011          | 2 y  | F   | 10 × 5         | Nontender abdominal mass | Parasitic cyst            | Laparotomy               | Mature cystic teratoma |
| 25           | 2011          | 19 y | M   | 10 × 9 × 8     | Abdominal pain, vomiting | Mesenteric cyst            | Laparotomy               | Mature cystic teratoma |
| 26           | 2011          | 60 y | F   | 9 × 8 × 8      | Abdominal pain         | Ovarian mass              | Laparotomy               | Mature cystic teratoma |

F, female; M, male.
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