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Giant mucinous cystadenoma of ovary in the pelvic cavity shaped like a turtle shell: case study and literature review

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Abstract: *[Method] To summarize the medical history and imaging features of a case of giant pelvic and abdominal mucinous ovarian cystadenoma shaped like a turtle shell outside the abdomen, so as to improve the ability of early diagnosis and differential diagnosis, prevent serious complications during and after operation, and summarize the surgical treatment experience. Combined with relevant literature reports, the diagnosis and treatment process were optimized. [Results]The patient was in stable condition after surgery and was discharged on the 10th day. Follow-up after discharge showed no recurrence.With the importance of early detection, preoperative evaluation, and multidisciplinary collaboration to reduce intraoperative and postoperative complications, surgical resection is the treatment of choice. Regular postoperative follow-up is helpful for early detection of recurrence.*

Keywords: *Ovarian mucinous cystadenoma, Exploratory laparotomy, Laparoscopy, Ovarian neoplasms*

Epithelial tumors of the ovary account for 65%-75% of all ovarian tumors, including serous, mucinous, endometrioid, clear cell, and transitional cell tumors.They are classified as benign, borderline and malignant. Mucinous cystadenoma is a benign epithelial tumor of the ovary, accounting for 15%-20% of all ovarian epithelial tumors, second only to serous cysts [1]. Ovarian mucinous cystadenoma can develop into borderline and malignant tumor tissues, such as clear cell carcinoma and mucinous cystadenocarcinoma. The histopathology of mucinous cystadenoma, borderline tumor and well differentiated mucinous carcinoma is relatively continuous and distinguishable [2]. Therefore, ovarian mucinous cystadenoma is a benign tumor with various histopathological differentiation and clinical manifestations. It is necessary to observe its treatment, especially long-term observation.

Ovarian mucinous cystadenoma is more common in women between 20 and 40 years old. In gross appearance, mucinous tumors are characterized by cysts of variable size, containing mucus, and having a smooth surface without invasion. Most ovarian mucinous tumors present as huge unilateral pelvic masses, and only 10% of bilateral primary mucinous cystadenomas [3]. They are usually asymptomatic in their early stages and have formed huge masses by the time they are detected, with an average diameter of 15 to 30 cm, but can reach 50 cm or larger and weigh 50 to 150 kg. The enlarged mass presents various compression symptoms, such as abdominal distension, abdominal pain, nausea, vomiting, frequent urination, and constipation [4].

1. Clinical data

A 67-year-old female patient, married and with a child, was admitted to the hospital due to a progressive enlargement of the abdomen for more than 3 years and a dull pain in the upper abdomen for 2 days. Physical examination showed that the patient was in good condition, with abdominal distension and a huge mass in the shape of a turtle shell, about 35cm×25cm (Figure 1), hard in texture, mild tenderness in the upper abdomen, and poor mobility. The position of bowel sounds was elevated about 7cm above the left upper umbilical cord, and the bowel sounds were hyperactive about 8 times/min, and did not reach the breath-water sound or metallic sound. CT examination revealed a cystic mass in the pelvic and abdominal cavity, extending from the pelvis to the upper abdomen, possibly originating from the right adnexa. Ultrasound examination showed a huge heterogeneous pelvic echo mass, about 35cm×25cm in size, occupying the entire pelvic cavity, with local separation and dense moving punctate hyperecho. The patient consented and requested exploratory laparotomy. Preoperative routine blood and biochemical analysis, Ca125, Ca199, CEA, and AFP were normal.

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Clinical evaluation showed normal cardiac function, normal ventilation function, and normal arterial blood gas analysis. During the procedure, central venous pressure (CVP) was monitored and crystalloid and colloid solutions were administered as appropriate to maintain CVP stability. During exploratory laparotomy under general anesthesia, it was found that the pelvic cavity and abdominal cavity were completely occupied by a huge cystic mass (Figure 2). The mass was multilocular, with smooth borders, no obvious adhesion to surrounding tissues, and was connected to the right ovary. We removed it intact without rupture. Total hysterectomy and bilateral oophorectomy were performed. The tumor was 35cm×15cm×25cm in size and weighed 12kg. It was multilocular with smooth inner wall and contained jelly-like material and a small amount of brown fluid. There were no obvious abnormalities on the left ovary or uterine surface. Histopathological diagnosis was cystic mucinous cystadenoma of the right ovary. Postoperative vital signs were stable and the patient was discharged on the 10th day. Follow-up after discharge showed no recurrence.

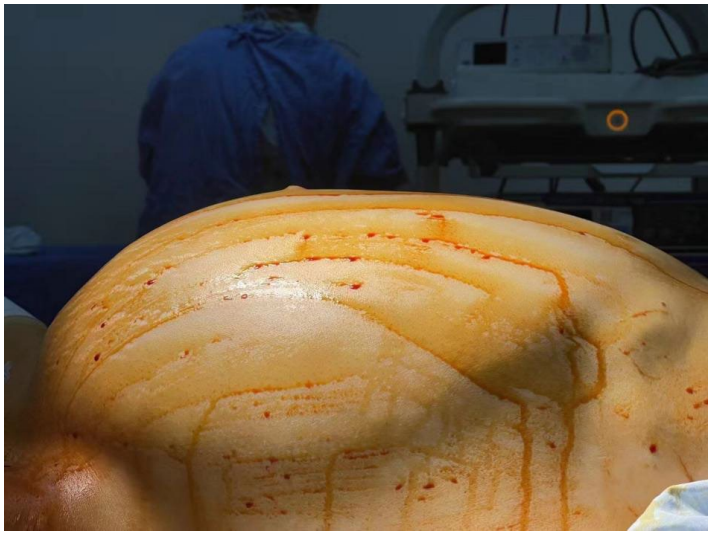

Figure 1: Abdominal appearance before surgery: huge pelvic-abdominal mass.

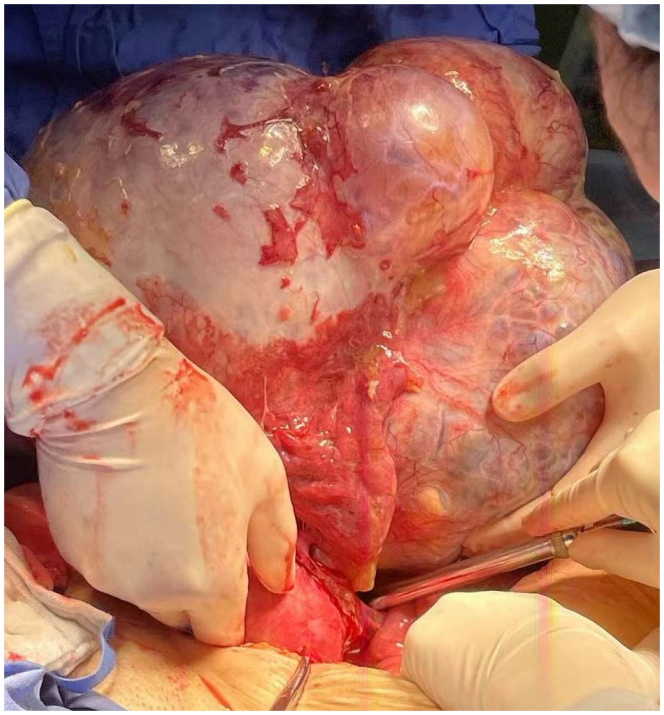

Figure 2: Intraoperative image of the ovarian cyst.

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2. Differential diagnosis

Ovarian serous cystadenoma is mostly manifested as unilocular polycystic cavity, unilateral cases are more common, bilateral 20%, the volume is large, the content is clear or straw yellow fluid, may have calcification, visible papillary projection. In contrast, mucinous cystadenoma is often multilocular and large, and very few patients may have papillary protrusions with jelly-like mucus content.

Ovarian borderline cystadenoma is a tumor with low malignant potential between benign and malignant tumors. Postmenopausal women, or postmenopausal patients with irregular vaginal bleeding are more common. The solid part of the tumor was diverse and irregular in shape, and the thickness of the cyst wall was consistent, mostly more than 3mm. There could be papillary wall nodules in the cyst, and the boundary between the tumor and the surrounding tissue was not clear. If the above signs are present, the possibility of borderline cystadenoma or malignant lesion should be considered.

Ovarian cystadenocarcinoma. If there is tissue infiltration, ascites, lymph node metastasis around the tumor, it is often suggested that ovarian cystadenocarcinoma. The presence of peritoneal infiltration, regardless of whether a lesion is found in the ovary, suggests a high probability of cancer.

3. Discussion

A 67-year-old married woman with a child underwent exploratory laparotomy for a huge pelvic and abdominal tumor in the shape of a turtle shell. Intraoperative exploration showed that the tumor was 35cm×15cm×25cm in size and 12kg in weight. It was multilocular with smooth inner wall and contained jelly-like material and a small amount of brown liquid. Finally, total hysterectomy and bilateral salpingo-oophorectomy were performed. The histopathological diagnosis was cystic mucinous cystadenoma of the right ovary. The postoperative recovery was good.

In current medical practice, giant ovarian tumors have become rare, and most cases have been detected at an early stage during physical examination [5]. Ovarian mucinous cystadenoma formation is usually asymptomatic in the early stages, but these tumors can become very large and fill the entire pelvic and abdominal cavity. Symptoms including pain, a palpable abdominal mass, and gastrointestinal reactions were present [6]. About 90% of cases of mucinous cystadenoma are unilateral masses with smooth appearance and multilocular type, but they can also be unilocular with myxoid fluid and masses ranging in size from a few centimeters to more than 30 centimeters [7]. Ovarian mucinous cystadenoma has the possibility of malignant transformation of 5%-10%. Ca199, Ca125 and CEA are often used to identify ovarian mucinous ovarian cancer, and also play an important role in initial evaluation and follow-up [8]. The most commonly used imaging assessments are ultrasound and MRI. The imaging findings were consistent with gross pathological features, including a large, unilateral, multilocular cystic mass. Echo, attenuation and signal intensity of the cyst cavity vary according to mucin content [9-10].The main treatment is surgery. Due to the compression of the huge mass, it is necessary to pay attention to the possibility of venous thromboembolism, hemodynamic changes, cardiac and pulmonary complications during the perioperative period. Lower extremity venous ultrasound examination was performed before operation to exclude thrombosis. Cardiac function tests, pulmonary CT, ventilation function tests and blood gas analysis were performed [11]. During the operation, sudden removal of a huge compression mass may cause obvious fluctuations in venous return flow, cardiac dilatation, pulmonary edema, and venous influx. Central venous pressure (CVP) should be monitored during the operation, and the reduction of venous compartment pressure can lead to severe functional hypovolemia and low cardiac output [12]. Crystalloid and colloid solutions were supplemented appropriately to keep the CVP stable for surgery under more favorable hemodynamic and cardiopulmonary conditions. At present, the surgical methods include laparotomy and laparoscopic surgery. The main advantages of laparotomy are to preserve the integrity of the mass, reduce the risk of rupture, and the operation space is not limited, and the operation time is short. The disadvantages are large abdominal incision, postoperative pain, prolonged recovery time and scar. Laparoscopic treatment of large ovarian tumors is controversial due to concerns that tumor rupture may spread and worsen the disease [13]. When you perform laparoscopic surgery for a complex and large ovarian mass, especially in the case of recurrence, rupture of the mass risks tumor dissemination, metastasis on the surface of abdominal organs and at the site of trocar insertion [14]. In the past, for patients with large ovarian masses, there were some urgent problems to be solved, such as limited operation space, difficulty in removing the mass and prolonged anesthesia time. Ovarian cysts > It is 10 cm in diameter and has a predominantly solid component, usually larger than existing laparoscopic specimen bags. Therefore, laparoscopic surgery is not recommended for solid ovarian masses larger

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than 10 cm [15]. With the increase of minimally invasive surgery and the development of intraoperative and postoperative life monitoring support system, minimally invasive surgery is increasingly used in the treatment of patients with ovarian mucinous tumors. Several studies have shown that laparoscopic resection of mucinous tumors is safe and feasible [16-17]. After the tumor is separated, it is placed into the laparoscopic specimen bag, and the edge of the specimen bag is pulled up through the abdominal incision, and the incision can be slightly expanded. After isolating the mass from the skin, subcutaneous tissue, and peritoneal cavity, mucus was aspirated with a syringe, resulting in a marked reduction in mass volume without the risk of disseminated contamination. The advantages of laparoscopic surgery include the need for several small incisions in the abdomen rather than the need for a large incision from the xiphoid to the pubic bone. Shorter hospital stay, faster postoperative recovery, and reduced pain and blood loss are the characteristics of laparoscopic surgery. However, a skilled laparoscopic surgeon is required, and if there is a risk of spillage from mass rupture, immediate conversion to laparotomy should be performed. The surgical scope of patients with ovarian mucinous cystadenoma depends on the patient's age, tumor size and histopathological results [18]. Ovarian cystectomy is the first choice for young patients, especially those who want to maintain their fertility. However, preservation of ovarian tissue can be difficult when faced with a large mass. Cyst resection is not complete and recurrence may occur. Only a few cases have been reported. Postmenopausal patients, regardless of histology, may be considered for total hysterectomy and bilateral salpingo-oophorectomy [19]. Previously, appendectomy was performed for any ovarian mucinous tumor, including benign lesions, but current literature data support that appendectomy is not performed as long as the appendix behaves normally and there is no evidence of pseudomyxoma peritonei [20]. Since most mucinous tumors of the ovary are benign or borderline, the overall prognosis is excellent. Due to the microscopic similarity between benign cystadenoma and malignant cystadenoma, it is believed that benign cystadenoma can develop into malignant, therefore, patients with conservative surgery need to be followed up closely to detect recurrence early and treated before the mass becomes large [21]. The management and follow-up of young patients is challenging, and the recommendation of an ultrasound examination every 3-6 months is currently the most effective way to follow up young patients with ovarian mucinous cystadenoma undergoing conservative surgery.

4. Conclusion

Ovarian mucinous cystadenoma is a common benign epithelial tumor of the ovary. Clinical diagnosis plays an important role in guiding the choice of surgical methods and postoperative management. Ovarian mucinous cystadenoma is rich in acidic mucopolysaccharides and mucin, most of which are unilateral, relatively less bilateral, and often multilocular. Ovarian mucinous cystadenoma has no obvious clinical manifestations in the early stage. It is difficult to make a judgment of benign and malignant by clinical manifestations, tumor markers and imaging examinations before operation. Only exploratory laparotomy and intraoperative frozen section pathological examination are performed to determine the scope of surgical resection. But intraoperative frozen section diagnosis of the exact pathological findings is difficult because these tumors are usually quite large, intraoperative section sampling is limited to a few areas of the tumor, and the differences between benign, borderline, and invasive carcinomas are subtle. The patient's age, fertility status and contralateral ovary condition should be considered during the operation. For young women, especially those with fertility requirements and unilateral benign tumors, oophorectomy or ovarian tumor removal should be performed on the affected side to preserve the function of the contralateral normal ovary. For postmenopausal patients, total hysterectomy and bilateral adnexectomy can be performed to reduce recurrence.

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