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Seven-liter ovarian cyst in an adolescent treated by minimal access surgery: laparoscopy and open cystectomy

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Abstract Laparoscopic approaches to giant ovarian cysts, particularly in adolescents, have critical management concerns as follows: risk of malignancy, risk of cyst rupture, and limited working space. A 15-year-old girl presented with a giant (>25 cm) ovarian serous cyst adenoma containing 7 L of fluid. At open laparoscopy, a giant, entirely cystic, smooth mass originating from the right ovary and lying between the symphysis and the xiphoid was observed. After intraabdominal fluid aspiration, open conservative cystectomy was performed, avoiding spillage. The patient made an uneventful postoperative recovery and was discharged on the second postoperative day.

To our knowledge, this is the largest ovarian cyst treated conservatively in an adolescent. Minimal access surgery, laparoscopy and open cystectomy, can be safely proposed in this group of patients. Conservative surgery should always be evaluated for preservation of ovarian function in cases of giant ovarian cysts in adolescents.

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Large ovarian cysts in adolescents may present as a challenge to gynecologists. The patient's age, menstrual status, the size and structure of the cyst, risk of malignancy, and symptoms are critical in choosing treatment strategies.

Laparoscopy represents the gold standard approach for the treatment of ovarian cysts. In the adolescent population, laparoscopy may be difficult, particularly when the cysts' sizes extend to the umbilicus because of limited working space, risk of rupture, and perioperative problems related to cardiorespiratory function [1].

Currently, many treat large ovarian cysts in adolescents by ovariectomy, whereas a few try laparoscopic cystectomy after aspiration of the cyst (blindly or under ultrasound [US]

guidance). These techniques do not rule out the risk of spillage and do not allow the surgeon to inspect the peritoneal cavity and the posterior cyst wall properly, which is considered a very important precaution to take before performing a cystectomy [2].

We present a case of a 15-year-old virgin girl with a giant ovarian cyst that was treated by minimal access surgery, laparoscopy and open cystectomy.

1. Case report

A 15-year-old girl was referred to our clinic because of acute pelvic pain and a finding suggestive of abdominal mass. Her abdominal girth had increased for the course of

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1 year, and the family thought that she was gaining weight because the absence of complaints from the patient.

Her medical history was normal because she had no serious illness or operations before this event. The patient experienced the onset of menarche at the age of 14 and had regular, monthly periods since that time. She was not sexually active.

Physical examination revealed a morbidly obese (weight, 96 kg; height, 1.67 m; body mass index, 34.4) adolescent girl with a painless, soft mass extending from the symphysis pubis to the epigastric area, filling the whole abdominal cavity (in the manner of a 28-week pregnant woman), with no inguinal or cervical lymphadenopathy detected.

Transabdominal US showed a thin-walled cyst with fine internal homogeneous echoes without any septation, solid area, or papillary projections arising from either internal or external wall surfaces. The exact size and origin of the cyst were difficult to estimate because its borders fell outside the range of the US probe. Neither ascites nor free abdominal fluid accumulation occurred. Upon color Doppler US examination, no blood supply to the cyst or on the cystic wall was observed. The uterus and abdominal organs seemed normal. A cystic mass lying between the symphysis and the xiphoid process was confirmed using computed tomography (Fig. 1).

Tumor markers and hematologic analyses were all negative.



Fig. 1 Computed tomographic scan showing the cystic mass lying between the symphysis and the xiphoid process.

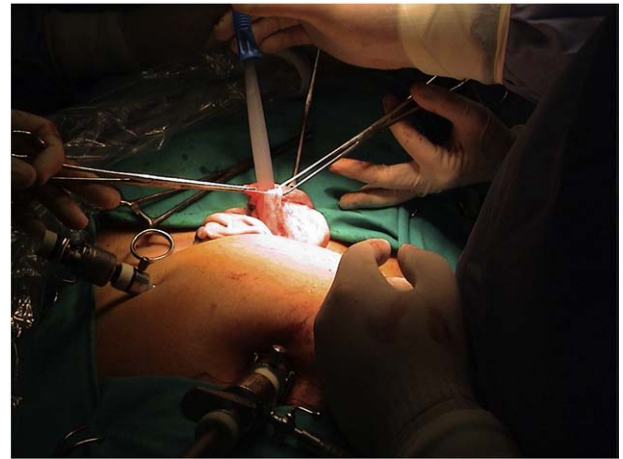


Fig. 2 Extraction and completing empty of the cyst through a 2-cm minilaparotomy incision in the suprapubic area.

After preoperative counseling and considering the low risk of malignancy, the patient and her family opted for laparoscopic surgery. The patient was scheduled for a laparoscopic cystectomy.

After induction of general anesthesia, a 10-mm trocar was placed through the umbilicus with an open Hasson technique used to avoid accidental perforation of the cyst. Two 5-mm ports were made on each side of the abdomen.

During laparoscopic inspection, the cyst was found to be arising from the right ovary and occupying the entire pelvis and lower abdomen. The cyst wall was intact, whitish, and adhesion-free. No solid components or external excrescences were observed. In the peritoneal cavity, no suspicious lesions were observed. Peritoneal washings were saved for cytologic examination.

After inspection, the cyst was punctured with a 5-mm trocar and aspirated under visualization using a suction irrigation apparatus. To avoid cyst spillage, the puncture site on the cyst was held and pushed up against the abdominal wall with a forceps (Karl Storz, Tuttlingen, Germany). A total of 7 L of serous fluid were aspirated from the cyst.

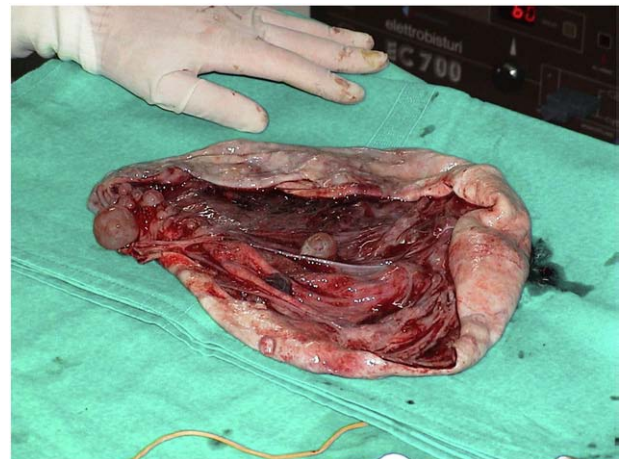


Fig. 3 Appearance of the giant ovarian cyst after its removal.

When the cyst became flaccid, the internal wall was inspected revealing a smooth surface, without papillae or nodules. The left ovary, uterus, fallopian tubes, appendix, liver surface, and the subdiaphragmatic area appeared normal.

The cyst was extracted in totality, with the residual ovary, through a 2-cm minilaparotomy incision in the suprapubic area. After emptying the cyst (Fig. 2), excision of the cyst wall was performed as usual, by stripping the cyst wall from the ovarian capsule (Fig. 3). The excess ovarian capsule was excised, saving most of ovarian tissue and the fallopian tube.

Hemostasis was secured, and the ovary was reconstituted with a suture. After ovarian suture, we observed that ovarian tissue loss was minimal, and the ovarian tissue was almost entirely saved. It was then returned into the peritoneal cavity. Peritoneal flushing was performed to wash out any remnants of fluid or tissues.

The suprapubic incision was sutured in double layer, and no complications were observed during laparoscopy or in the following days. She was discharged on the postoperative second day without any problems. Microscopic examination showed a single layer of flattened to cuboidal cells lining the surface epithelium. At her latest review (5 years after surgery), she has not had any symptoms, and there has been no recurrence of the cyst on US examination.

2. Discussion

Ovarian neoplasms account for approximately 1% of all tumors in children and adolescents. They are mostly physiologic or benign with less than 5% of ovarian malignancies occurring in this age group. However, ovarian enlargement, whether cystic or solid, should be evaluated in these patients to rule out malignancy because approximately 35% of all ovarian neoplasms occurring during childhood and adolescence are malignant [3].

Currently, laparoscopy has become the gold standard approach for most pediatric surgeons in the treatment of ovarian cysts with great emphasis placed on preserving ovarian tissue.

The safety of laparoscopic management of benign adnexal masses has been widely demonstrated, and better cosmetic results, less blood loss, less pain and requirement for analgesic, faster recovery, and shorter hospitalization time are also reported. However, when the malignancy risk is high, the laparoscopic technique is not suitable. Appropriate patient selection for laparoscopic ovarian surgery requires information on the characteristics of the cyst. Malignancy risk is very low when the cyst presents, at US examination, as unilateral, unilocular, with a smooth surface and a thin wall, and without solid parts or ascites. Among the criteria giving rise to a suspicion of malignancy, the following can be mentioned: irregularity and thickness of the cyst wall, the existence of a septum and its thickness, the existence of a solid intracystic element, and visible intracystic vegetations.

Normal levels of tumor markers, especially serum CA 125 levels, support the benign characteristics of the cyst [4,5].

Giant ovarian cysts are rarely seen because of pediatricians' periodic examinations and the widespread use of noninvasive diagnostic procedures such as US; nevertheless, even today, cases of giant ovarian cysts are still encountered. During the past few decades, a few giant ovarian serous cyst adenomas have been reported in different countries, though these reports are generally in adults.

The laparoscopic approach to giant ovarian cysts in the adolescent population may be difficult because of limited working space and the risk of rupture. Larger cysts have a higher risk of malignancy and an iatrogenic spillage of malignant cells may occur. If we perform a meticulous inspection of the cyst and the abdomen at laparoscopy, we can obtain a satisfactory level of security against malignant spillage [6].

In our patient, there were no signs of malignancy in both US and computed tomography, and therefore, we suggested the laparoscopic approach.

To reduce the risk of cyst rupture and the difficulty of a limited workspace, we drained the fluid through the right trocar, which was placed directly into the cyst, pushing the border of the aspiration site against the abdominal wall to prevent leakage.

Other articles reported treatment of giant ovarian cysts in adolescents, but they performed mostly oophorectomy [7]. If cystectomy was performed, the cyst was drained preoperatively by suprapubic catheter or under ultrasonographic guidance [1,8].

We chose aspiration under laparoscopic view because it allows assessment of the abdominal cavity and ovarian cyst before cyst puncture, thus, limiting the risk of spillage that cannot be avoided by US-guided aspiration.

In patients with large adnexal masses, special consideration must be given also to hemodynamic and ventilatory monitoring, as well as intraoperative fluid management. Although our patient had an extremely large cyst, occupying most of the abdominal cavity, she had neither respiratory nor cardiac problems during intraoperative or postoperative periods.

To the best of our knowledge, this case represents the largest cyst treated conservatively in an adolescent. Minimal access surgery, laparoscopy and open cystectomy, in cases of giant ovarian cysts, seems to be a safe and applicable treatment modality, even in adolescents [9,10].

Today, surgeons should consider the reproductive future of the adolescents; conservative surgery should always be evaluated for preservation of ovarian function in cases of giant ovarian cysts.

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