Surgical approach to giant ovarian masses in adolescents: technical considerations

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Abstract

Ovarian neoplasms arising from the surface epithelium are rare in the pediatric population; their knowledge is therefore limited and the appropriate management is poorly defined. We describe our experience and suggest our surgical approach to adolescents affected by voluminous ovarian masses. Two 15-year-old adolescents were admitted to our institution in 2017 for multilobulated, fluid-filled masses measuring over 30 cm arising from the ovaries. The cystic component was drained intraoperatively with a spillage-free technique, consisting in the application of a sterile auto-adhesive transparent drape on the cyst and the insertion of a 12 Ch pleural drain, secured with a purse-string suture. Unilateral salpingo-oophorectomy was then carried out. Histology revealed mucinous cystadenoma in both patients. Surgical treatment of ovarian masses should aim at both radically excising the tumor and preserving the fertility of the patients. Decompression with spillage-free techniques can be useful to achieve radical therapy with limited manipulation of tissues.

Introduction

Ovarian neoplasms account for approximately 1% of all childhood malignancies. Of these, germ cell tumors are the most common and most widely characterized, accounting for 60% of all ovarian tumors.[1] Less than 20% of ovarian tumors in pediatric population arise from the surface epithelium and among them almost half are benign tumors.[2] Various histotypes are recognized and classified according to the predominant histological features (serous, mucinous, clear cell, endometrioid or undifferentiated) and serous and mucinous tumors are the most frequent in pediatric age.[3]

Due to their rarity, current knowledge of these tumors in the pediatric and adolescent population derives from case reports and small case series leading to limited data on clinical presentation, treatment, and outcomes. Therefore, the appropriate management and natural history of these tumors is poorly understood.[4]

We describe our experience and suggest our surgical approach to adolescents affected by voluminous ovarian masses.

Case Report

We retrospectively examined the patients who were admitted to our institution for non-germ cell ovarian masses in the year 2017. Data regarding clinical manifestation, radiological appearance, surgical operation and histology were retrieved and analyzed. Informed consent for publication was obtained from the parents.

Two 15-year-old adolescents were admitted to our institution in 2017 for abdominal distension associated with dysuria. Both had had the menarche at the approximate age of 13 years, had regular menses and unremarkable past medical history.

The first patient had been complaining of progressive abdominal distension for approximately four months and had been initially diagnosed by her family doctor with abdominal bloating secondary to functional intestinal disorder. The second patient had complained of abdominal distension for less than one month and was referred to our institution by her family doctor in the suspicion of an abdominal mass.

On examination, both patients presented with an elastic, non-tender palpable mass occupying the whole abdomen (Figure 1). Physical examination was otherwise unremarkable in both patients.

Both patients were studied with abdominal contrast-enhanced magnetic resonance.

The first patient had a multilobulated, fluid-filled mass of the right ovary with areas of mucinous components, measuring 30 cm (Figure 2). The ovarian parenchyma was hardly recognizable and remarkable right hydroureteronephrosis and bladder compression were noted. The contralateral ovary was normal, and no other abnormalities were reported.

The second had a mass arising from the left ovary, measuring 34 cm, with poorly defined residual parenchyma and a multilobulated, fluid-filled appearance similar to the first patient, also confirmed by computed tomography. Hydroureteronephrosis and bladder compression were noted. The contralateral ovary and the rest of the abdomen were normal.

After consultation with pediatric oncologist, both patients underwent full pre-operative staging: computed tomography scans of the thorax were normal and serological markers (α-fetoprotein, β-human chorionic gonadotropin, carcinoembryonic antigen, CA 15.3, CA 125 and CA 19.9) were within normal range in both adolescents.

Since the diagnosis of malignant ovarian tumor could not be ruled out in the pre-operative assessment, both patients underwent surgical treatment according to the recommendation of the Italian Association of Pediatric Hematology-Oncology with the intent of achieving radical excision of the tumor. Considering the dimensions of the mass, that in both cases did not allow complete excision without risk of lesions of adjacent structures of rupture of the mass itself, a plan was made to drain intraoperatively the cystic components with a technique that would avoid spillage of cystic fluid in the abdomen and then perform a unilateral salpingo-oophorectomy.

Kustner laparotomy was performed in both patients and samples of peritoneal fluid for cytology were collected as first procedure. A sterile auto-adhesive transparent drape was applied on the affected ovary, isolating the surface of the ovary from the abdominal cavity, and a 12 Ch pleural drain, secured with a purse-string suture, was inserted in the cystic component (Figure 3). Cystic fluid was then drained and sampled for cytology until the ovary shrank enough

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to allow safe excision. Unilateral salpingo-oophorectomy was then carried out.

The contralateral ovary and the peritoneal surface were inspected in both patients and resulted normal. No macroscopically abnormal lymph nodes were noted. Post-excision samples of peritoneal fluid were collected in both patients before the end of surgical procedure. Surgical procedure took 120 minutes for the first patient and 100 minutes for the second patient.

Post-operative course was uneventful in both patients. The first patient was discharged on the sixth post-operative day, while the second patient was discharged four days after surgery. Histology revealed mucinous cystadenoma in both patients; all the samples of peritoneal fluid were negative for neoplastic cells. Both patients are not candidate for further therapy and are disease-free after six months of follow-up; both have been studied with magnetic resonance three months after surgery and are currently undergoing clinical and sonographic follow-up.

Figure 1. Clinical appearance of a patient with a giant ovarian mass.

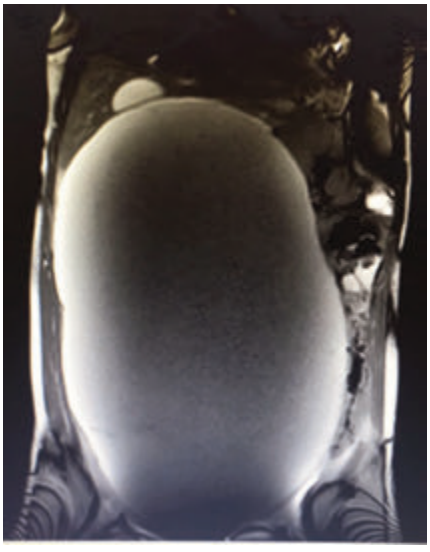

Figure 2. Magnetic resonance image of a giant ovarian mass (coronal view).

Discussion

Tumors arising from the epithelial surface of the ovary are extremely rare in pediatric and adolescent population and, therefore, their treatment is based on evidence derived from adults.[2,4] Approximately half of these tumors are benign;[1,2] moreover, even in case of malignant histology and advanced-stage disease current multimodal treatment protocols achieve near 100% 5-year overall survival and over 80% 5-year even-free survival.[5,6]

Considering these factors, mutilating surgical operations are no longer warranted in pediatric population, and current surgical strategies aim both at curing the disease and sparing the fertility of the patients.[7,8] In recent years, unilateral salpingo-oophorectomy and tumorectomy, that allow complete sparing of the unaffected ovary, have been advocated as effective fertility-sparing surgical therapies for ovarian tumors.[3,8-10] From the point of view of preserving fertility, both techniques have proved to be effective.[11,12] Cryopreservation of ovarian tissue from the unaffected ovary might be an option to preserve fertility in patients who are candidate for gonadotoxic chemotherapy; in this case, it is essential to obtain specimen that are completely free from neoplastic cells.[13] It is also noteworthy that incomplete excision and spillage or rupture of the tumor during surgery have been associated with recurrence of the disease even in case of benign or borderline histology;[4,8,14] surgical strategies should therefore be carefully planned to minimize this risk.

Ovarian tumors, especially mucinous cystadenoma, often present as voluminous cystic masses;[3,4,10] in such situations, decompression of the cystic component before mass excision is often necessary to avoid lesion to the adjacent structures. To date, there are only a few descriptions of techniques that allow safe decompression of the cyst with a minimal risk of fluid spillage or rupture;[15,16] the basic principle is the isolation of the abdominal cavity from the area where the mass is punctured, that can be achieved both with laparoscopy[15] and, in laparotomy, applying a sterile drape on the mass before puncture.[16] Our experience suggests that even voluminous ovarian masses can be radically excised with a minimal risk of lesion to adjacent organs with careful pre-operative planning and meticulous intra-operative technique.

Conclusions

Surgical treatment of ovarian masses should aim at both radically excising the tumor and preserving the fertility of the patients. Techniques that prevent spillage from cystic masses during decompression can be useful to achieve radical therapy with limited manipulation of tissues. Our experience provides further evidence of the safety and feasibility of spillage-free surgical techniques. Given the rarity of these conditions, further studies and cooperation among specialized centers are essential to define standards of treatment.

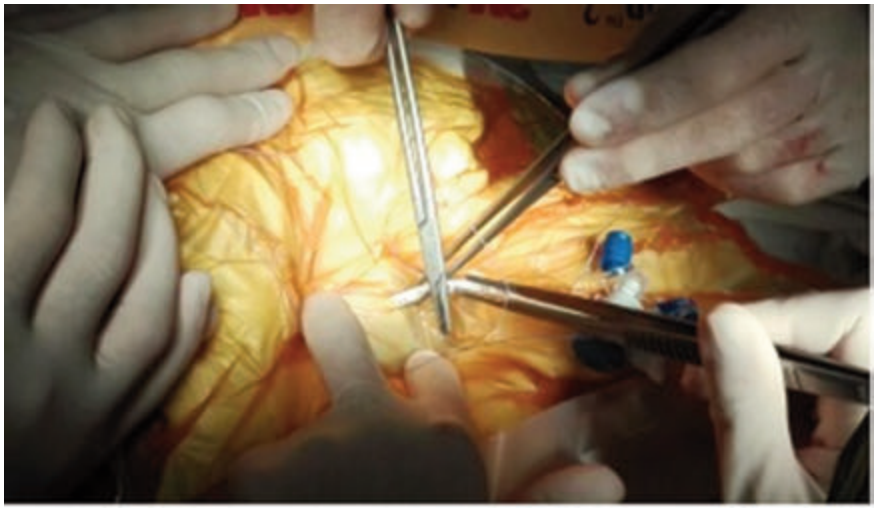

Figure 3. Insertion of drainage in the cystic component.

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