Surgical approach to giant ovarian masses in adolescents: technical considerations

Giorgio Persano,1 Elisa Severi,2 Noemi Cantone,2 Filippo Incerti,1 Enrico Ciardini,2 Bruno Noccioli2
1Department of Pediatric Surgery; 2Department of Neonatal and Emergency Surgery, Azienda Ospedaliero-Universitaria Meyer, Firenze, Italy

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.

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

Correspondence: Giorgio Persano, Department of Pediatric Surgery, Azienda Ospedaliero-Universitaria Meyer, Viale Gaetano Pieraccini 24, 50139 Firenze, Italy. E-mail: giorgio.persano@unifi.it

Contributions: GP, project development, data collection and analysis, manuscript writing; ES, data analysis, manuscript editing; NC, data analysis, manuscript editing; FI, data collection and analysis; EC, project development, project supervision, manuscript editing; BN, project supervision, manuscript editing.

Conflict of interests: the authors have no conflict of interests to disclose.

Received for publication: 21 May 2018. Revision received: 6 July 2018. Accepted for publication: 10 July 2018.

This work is licensed under a Creative Commons Attribution NonCommercial 4.0 License (CC BY-NC 4.0).

©Copyright G. Persano et al., 2018 Licensee PAGEPress, Italy
Pediatric Reports 2018; 10:7752 doi:10.4081/pr.2018.7752
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 sono-graphic follow-up.

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. Approximately half of these tumors are benign; 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.

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. 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. From the point of view of preserving fertility, both techniques have proved to be effective. 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. 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; surgical strategies should therefore be carefully planned to minimize this risk.

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

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

Figure 3. Insertion of drainage in the cystic component.
References

1. Hazard FK, Longacre TA. Ovarian surface epithelial neoplasms in the pediatric population: incidence, histologic subtype, and natural history. Am J Surg Pathol 2013;37:548-53.
2. Nasioudis D, Alevizakos M, Holcomb K, Witkin SS. Malignant and borderline epithelial ovarian tumors in the pediatric and adolescent population. Maturitas 2017;96:45-50.
3. Virgone C, Alaggio R, Dall'Igna P, et al. Epithelial Tumors of the Ovary in Children and Teenagers: A Prospective Study from the Italian TREP Project. J Pediatr Adolesc Gynecol 2015;28:441-6.
4. Childress KJ, Patil NM, Muscal JA, et al. Borderline Ovarian Tumor in the Pediatric and Adolescent Population: A Case Series and Literature Review. J Pediatr Adolesc Gynecol 2018;31:48-54.
5. AIEOP. TCGM protocol; 2004.
6. Palenzuela G, Martin E, Meunier A, et al. Comprehensive staging allows for excellent outcome in patients with localized malignant germ cell tumor of the ovary. Ann Surg 2008;248:836-41.
7. Palomba S, Falbo A, Del Negro S, et al. Ultra-conservative fertility-sparing strategy for bilateral borderline ovarian tumours: an 11-year follow-up - Hum Reprod 2010;25:1966-72.
8. Song T, Hun Choi C, Lee YY, et al. Oncologic and reproductive outcomes of cystectomy compared with oophorectomy as a treatment for borderline ovarian tumours. Hum Reprod 2011;26:2008-14.
9. Tajiri T, Souzaki R, Kinoshita Y, et al. Surgical intervention strategies for pediatric ovarian tumors: experience with 60 cases at one institution. Pediatr Surg Int 2012;28:27-31.
10. Cowan RA, Haber EN, Fauze FR, et al. Mucinous Cystadenoma in Children and Adolescents. J Pediatr Adolesc Gynecol 2017;30:495-8.
11. Kanat-Pektas M, Ozat M, Gungor T, et al. Fertility outcome after conservative surgery for borderline ovarian tumors: a single center experience. Arch Gynecol Obstet 2011;284: 1253-8.
12. Koskas M, Uzan C, Gouy S, et al. Fertility determinants after conservative surgery for mucinous borderline tumours of the ovary (excluding peritoneal pseudomyxoma). Hum Reprod 2011;26:808-14.
13. Imbert R, Moffa F, Tsepelidis S, et al. Safety and usefulness of cryopreservation of ovarian tissue to preserve fertility: a 12-year retrospective analysis. Hum Reprod 2014;29:1931-40.
14. Ben-Ami I, Smorgick N, Tovbin J, et al. Does intraoperative spillage of benign ovarian mucinous cystadenoma increase its recurrence rate?. Am J Obstet Gynecol 2010;202:142.e1-5.
15. Lee LC, Sheu BC, Chou LY, et al. An easy new approach to the laparoscopic treatment of large adnexal cysts. Minim Invasive Ther Allied Technol 2011;20:253-6.
16. Watanabe E, Tanaka K, Takeda N, et al. Surgical technique to prevent spillage of cyst fluid during operation for cystic ovarian tumors. Pediatr Surg Int 2013;29:645-9.