

**Case Report**
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## Ovary-Sparing Surgery for Ovarian Dermoid Cysts in Children: A Report of Two Cases and Literature Review

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**ABSTRACT**

Ovarian lesions in during childhood and adolescence are rare and most of these are benign. Mature teratomas are frequently seen in these cases. The most common of these masses in children are the mature cystic teratoma which are also known as dermoid cysts. The management of children with ovarian dermoids has evolved over recent years in a manner of ovary preservation. In this review article two cases of ovarian dermoids are presented. The tumoral mass was totally excised in both of these cases preserving the effected ovary in an ovary sparing manner. The medical history of the patients, radiological and histopathological findings are also given together with a brief literature review on this issue.

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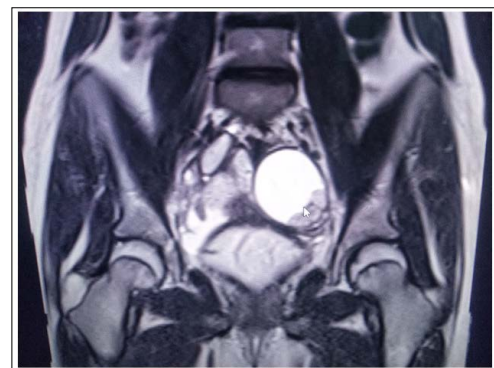
Ovarian lesions in pediatric population are relatively rare and can be categorized as functional or neoplastic. According to their cell of origine these benign and malignant lesions can be subdivided a epithelial, germ cell, sex cord-stromal or metastatic [1]. Approximately one-fourth of all ovarian neoplasms are germ cell derived tumours and majority of these are benign teratomas or dermoid cysts [2]. In this review article two children with ovarian dermoids are presented and it is aimed in this study to present the presentation, diagnosis and management of ovarian dermoid cysts in children with special regard to ovarian sparing surgery (OSS). The medical history of the patients, radiological and histopathological findings are also given and the topic is discussed under the light of relevant literature.

**Case Reports**

**Case 1:** A 16 year-old girl presented with intermittent abdominal pain for 1 year before admission to our hospital. Physical examination revealed no pathological findings. Ultrasonography (US) showed a septated cystic mass adjacent to right ovary measuring 3.4x2.9 cm in size with no echogenicity. Magnetic resonance imaging (MRI) showed similar findings (Figure 1). The tumor markers including beta-HCG, AFP, CEA, CA-125, CA 19.9 and LDH levels were within normal ranges with respect to patient age. After consultation with pediatric oncology surgical treatment was planned. With an ovary sparing manner, total excision of the mass was performed via open surgical approach (Figure 2). She was discharged 24 hours after surgery without complications. After 1 month of follow up physical examination and scrotal USG were negative for recurrence of the disease.

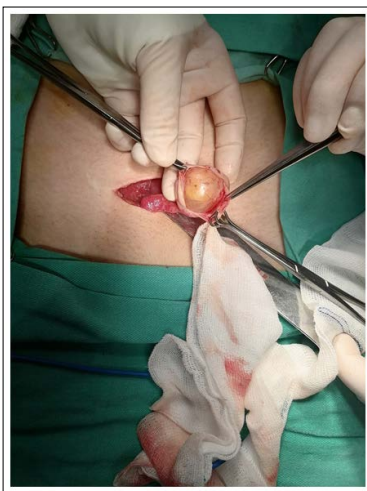


**Figure 1A**



**Figure 1B**

**Figure 1A, 1B:** MRI views of a patient with ovarian dermoid cyst. (Arrow showing cystic mass)



**Figure 2:** View of an ovarian dermoid cyst during ovary sparing surgery.

Case 2: A 14 year-old female presented with abdominal pain. Physical examination was otherwise normal. Ultrasonography (US) showed a cystic mass located in left ovary measuring 5.6x4.3x4.6 cm in size with no echogenicity. Doppler interrogation showed no vascularity in that cystic mass. Magnetic resonance imaging (MRI) showed similar findings and tumor markers including beta-HCG, AFP, CEA, CA-125, CA 19.9 and LDH levels were normal with respect to age of the patient. After consultation with pediatric oncology surgical treatment was planned. With an open surgical approach via pfannenstiel incision using an ovary sparing surgery, total excision of the mass was performed (Figure 3). She was discharged 24 hours after surgery without complications. After 2 months of follow up physical examination and scrotal USG were negative for recurrence of the disease.



**Figure 3:** Postoperative view of an ovarian dermoid cyst.

## Discussion

In contrast to adults, the majority of ovarian neoplasms in children are benign and it has been reported that malignancy occurs in approximately 10-20% of ovarian neoplasms in children [3-5]. Ovarian teratomas are the most frequent type of ovarian mass during childhood and adolescents [6]. With an incidence of 2.6 /100.000, about 75% of them are benign pathology [7]. These tumours are embryonal neoplasms and include two or three germ layers [8]. According to World Health Organization classification these tumours are divided into mature and immature teratomas and the most common teratomas in children are the mature cystic which are also named as dermoid cysts [9].

The evaluation of children with ovarian lesions includes patient history, physical examination, laboratory tests and imaging

findings. These tumours can be diagnosed incidentally during examination for menstrual abnormalities or hydronephrosis [6]. Clinical presentation may include abdomino-pelvic pain together with palpable pelvic mass [10]. These patients may also be diagnosed as acute abdomen and signs of peritonitis due to ovarian torsion or hemorrhage [11].

Preoperative investigations include ultrasound, computed tomography or magnetic resonance imaging. In addition tumor markers including alpha fetoprotein (AFP), human chorionic gonadotropin (HCG), lactic dehydrogenase (LDH), CA-125, CA-19.9, CEA should be obtained. Based on imaging findings ovarian neoplasms can be subclassified as cystic, complex or solid [12]. Although tumour markers are generally found to be elevated in malignant ovarian lesions, it should be kept in mind that 20% of pediatric benign ovarian neoplasms can be associated with increased levels of tumour markers [13]. Tumor markers in both of our cases presented in this study were found to be within normal limits with respect to patient ages.

After the evaluation of these children with ovarian masses with the history, physical examination, imaging studies and tumour markers, preoperative risk stratification and patient selection for OSS can be performed. Traditional surgical management of ovarian dermoids has been oophorectomy via laparotomy. Potential negative effects of oophorectomy include an increased risk for early menopause, premature ovarian failure, impaired sexual growth, low bone density, neurological and cardiac disease in adulthood, and decreased potential for future fertility [14-17]. Because of these negative effects OSS is now considered standard surgical approach for benign ovarian lesions and includes removal of the tumour only preserving the surrounding normal ovary in place. This procedure can be done via laparoscopic approach or with an open laparotomy. In adults laparoscopy has become the accepted approach however in childhood the preferred surgical approach remains controversial. Advantages of laparoscopic approach include reduced intraoperative blood loss, shorter hospital stay, reduced analgesic requirement, earlier return to daily activities, and improved cosmesis [18-26]. Disadvantages of laparoscopy include increased risk of intraoperative cyst rupture, spillage of cyst contents into abdominal cavity, increased adhesions, chemical peritonitis, and possible upstaging of malignant neoplasms. No matter which kind of surgical intervention either open surgery or laparoscopy is performed, in the case of cyst rupture saline lavage of the abdominal cavity has been shown to be effective in reducing the inflammation and adhesion formation in a rabbit model [27]. Neither of our cases did not face cyst rupture during surgical intervention and OSS was performed without any peroperative complications including cyst rupture or bleeding. Another concern regarding OSS for ovarian dermoids is the possibility of increased risk of recurrence. In a study 4.2% of patients treated laparoscopically revealed recurrence of ovarian dermoids as compared to none in 150 laparotomy cases [24]. It has been suggested that increased dermoid recurrence rate following laparoscopic cystectomy may be due to incomplete excision of the cysts [24]. Despite rather short follow-up of our patients neither of them have recurrence of dermoid cyst and are symptom-free.

In conclusion, OSS should be the first choice of surgical management in children with ovarian dermoids not only for avoiding risks for early menopause, premature ovarian failure, impaired sexual growth, low bone density, neurological and cardiac disease in adulthood but also to preserve future fertility of these children. But careful assessment for malignant features and after triaging and selecting appropriate patients meticulous

surgical technique via either laparoscopy or open surgery should be performed to avoid rupture of the cyst during surgical intervention. In case of rupture saline irrigation of the abdomino-pelvic cavity should be preferred to avoid future adhesions.

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