

Adnexal masses in adolescent girls with pelvic pain: Report on 63 cases

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Abstract To improve clinical appreciation of these lesions, we reviewed the presentation, evaluation, outcome, and therapeutic aspects of painful adnexal masses in adolescent females. During the period January 2005–September 2006, 63 adolescent females with painful adnexal masses were recruited. The patient management and outcomes were documented. The mean age was 15.36 ± 1.6 years, and the mean diameter of the masses was 54.5 ± 1.3 mm. Forty-nine patients (77.7%) underwent surgical management, and 45 of the 49 surgeries were achieved by laparoscopic surgery (91.8%). Two converting laparotomies (4%) were performed. Fourteen patients with a presumed functional cyst were followed up without surgery. Postoperative histopathologic evaluation revealed a benign epithelial ovarian cyst rate of 26.5%, a mature cystic teratoma rate of 22.4%, and a borderline ovarian tumor rate of 4.08%. Non-neoplastic adnexal lesions were encountered in surgeries of 22 cases. The incidence of acute ovarian torsion and true ovarian neoplasm was 9.52% and 55.1%, respectively, and none was malignant. True ovarian neoplasia remains a common indication for surgery in the majority of adolescents. Because most cases are benign, minimal access surgery should be performed whenever feasible.

Keywords Adolescents · Pelvic pain · Ovarian neoplasia · Laparoscopic surgery

Introduction

Adnexal masses in adolescence are common in gynecologic practice. Although most adolescents with adnexal masses are asymptomatic and can be followed without treatment, some will require more active measures.

Most neoplasms of the ovary are asymptomatic unless they have been subject to rupture or torsion. On the other hand, any adnexal enlargement may cause menstrual abnormalities and a sensation of pelvic irritation in each case, especially in adolescent girls [1]. Pelvic pain is the most common gynecologic symptom among adolescent girls with an adnexal mass and the leading indication for hospitalization.

Due to anovulation during adolescence, physicians can presume that an adnexal mass is a functional or hyperplastic change of the ovary rather than a true neoplasm [2]. In fact, adolescent girls are subject to the same variety of adnexal masses as older reproductive women, including uterine, ovarian, tubal, and extragenital masses. Deciding which patient needs surgical exploration can best be done by considering the differential diagnosis and clinical characteristics of the adnexal mass.

Many young women with this clinical presentation seek an appropriate management plan that may have especially dramatic impact on adolescent girls due to undertreatment, overtreatment or no treatment. Simple, unilocular cysts of small size are almost functional and do not require surgical intervention over an appropriate period of 2 to 3 months. Large, growing, solid or multilocular masses with pelvic pain require surgical evaluation [3]. Laparoscopic surgery

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remains the most common treatment for such cases because it allows definitive diagnosis and treatment [4].

This paper will examine the incidence of true ovarian neoplasm and the impact of acute pelvic pain in adolescent girls with an adnexal mass. The following search strategy was used to conduct a review of existing evidence from the literature.

Materials and methods

A single center retrospective study was performed between 1 January 2005 and 30 September 2006. Patients were enrolled at TCSB Etlik Ankara Maternity and Womens' Health Teaching Hospital-Adolescent Unit. A total of 63 girls aged 15–20 years who were hospitalized for pelvic pain associated with an adnexal mass was eligible for the study. Parents or relatives did not object to outpatient follow up of the patients, and informed patient and parental consents for hospitalization were obtained. Exclusion criteria were age 21 years or more and any suspected müllerian duct abnormality or malignant neoplasia.

Patients underwent a full structured interview and abdominopelvic examinations by a senior doctor at their first admission to establish whether they needed an urgent surgical intervention. Deciding which patient needed surgical exploration was done by considering the characteristics of the adnexal mass on pelvic examination, ultrasonography, and laboratory evaluation. Vital signs were noted and blood drawn for serum alpha-fetoprotein, quantitative β hCG, Ca125, carcinoembryogenic antigen, electrolytes, and liver function test, and urine analysis was performed preoperatively.

Any mass larger than 10 cm in diameter and any patient who was unstable due to a decreasing hematocrit level or untractable abdominopelvic pain was urgently explored by surgery. A real time sonography (transabdominal/vaginal) was necessary in all patients, and/or CT-MRI scans occasionally were necessary to further define the nature of the adnexal mass. Specific diagnostic tumor marker assays were also available; Ca125 levels were estimated whenever a complicated mass was considered. Sexually active adolescents with a suspected adnexal mass were also evaluated for an ectopic pregnancy by serum β hCG estimation.

After defining issues unique to each patient, a management plan was devised. At subsequent visits the issues and management plan were discussed with the patient and revised as necessary. Length of hospitalization was calculated as the date of discharge minus the date of admission. Management, operation details and histopathologies (if there were any), and patients' clinical outcomes were independently collected after discharge by a clinician.

Review involved a detailed assessment of the patients' medical charts and of all investigations relating to the painful adnexal mass and management. Follow-up has been continuing for each patient.

Results

The mean age was 15.36 ± 1.6 years, and the mean diameter of the masses was 54.5 ± 1.3 mm. Ca125 levels ranged between 1–247 U/ml. Acute pelvic pain was a major cause of hospitalization (80%); a total of 10% had menstrual irregularities, and the others had persistent cysts with signs of peritoneal irritation.

Forty-nine patients (77.7%) underwent surgical management, and 14 patients with a presumed functional cyst were followed up with expectant management, ranging between 2–4 days, and none of them were readmitted to the clinic for any surgical intervention. Overall, 45 of the 49 surgeries were achieved (91.8%) by laparoscopic surgery (Fig. 1).

Two converting laparotomies (4%) were performed for an unsuspected stage 1b borderline ovarian tumor and a laceration of a blood vessel during laparoscopic surgery. Due to a massive hemoperitoneum and a semisolid adnexal mass with more than 10 cm in diameter, the two underwent primary exploratory laparotomy.

Postoperative histopathologic evaluation revealed a benign epithelial ovarian cyst rate of 26.5% ($n=13$; 9 serous, 4 mucinous), a mature cystic teratoma rate of 22.4% ($n=11$), and a borderline ovarian tumor rate of 4.08% ($n=2$). The incidence of true ovarian neoplasm was 55.1%, and none was malignant (Fig. 2). Acute ovarian torsion, ruptured endometrioma, embryogenic duct remnant cysts and luteinized cyst were found in 6, 3, 4, and 3 of the 47 patients, respectively. Of note, one tubal pregnancy, two hydrosalpenxes, two ovarian fibromas,

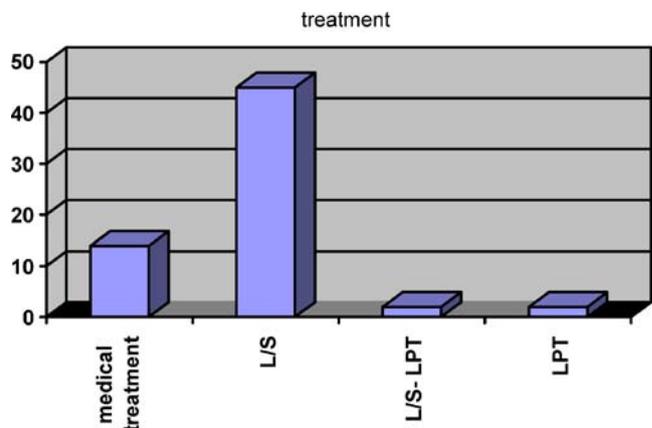
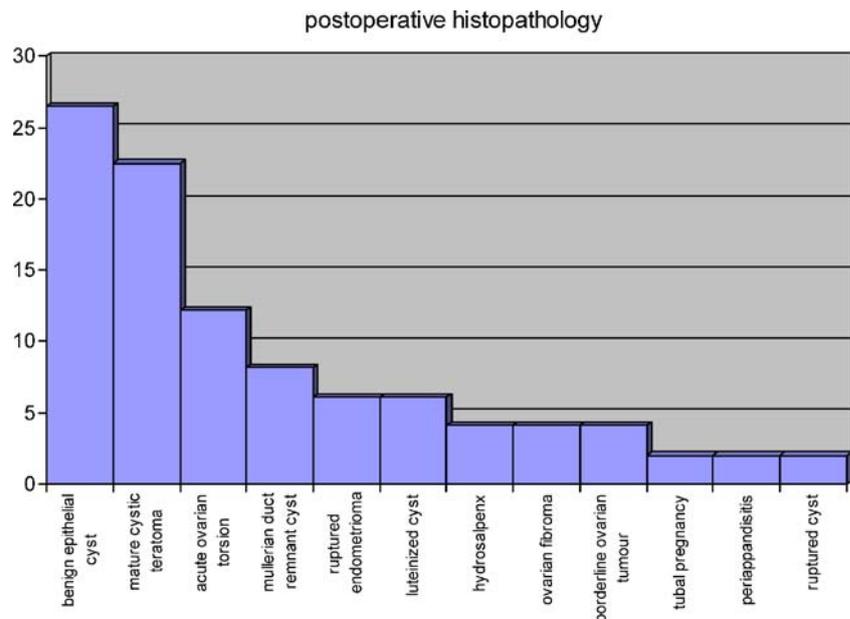


Fig. 1 Painful adnexal masses in 63 adolescents and management outcomes

Fig. 2 Histopathological characteristics of adnexal masses with pelvic pain in 63 adolescent young women



and one periappendicitis in the surgery subjects of the 47 were also detected. No malignant tumor was detected (Fig. 2).

There were no postoperative complications requiring readmission after surgery, but two patients with borderline ovarian tumor were on regular oncological follow up. The median duration of the hospitalization was 2.63 days, ranging from 2–5 days. The patients who underwent expectant management remained on regular follow-up by ultrasound and/or pelvic investigation with or without combined oral contraceptives, and none has experienced troublesome symptoms for a year.

Discussion

The occurrence of adnexal pathologies in adolescent girls is thought to be infrequent. But with increased utilization of imaging techniques, an increasing number of pelvic masses are being identified in this age group. The incidence of adnexal mass is reported to be 2.6/100,000 women aged 20 years or less by Pienkowski et al. [1].

The incidence of ovarian cancer in adolescents comprises only about 1% of all malignant gynecologic tumors in these lesions. On the other hand, it is known that an adnexal mass may be neither ovarian nor tubal in origin. For instance, inflammatory disorders of the intestines or embryogenic duct remnant cysts can also present as painful adnexal masses. Interpretation of clinical findings and symptoms should, however, be made with caution, because adolescence is known to be accompanied by anovulatory cycles that may cause functional cyst formation. Conservative and surgical approaches have been described to manage

adolescent females with palpable and painful adnexal masses. This causes a management dilemma, particularly in adolescent females in whom the possibility of functional cysts appears to be increased.

The present study has shown that non-neoplastic cysts in adolescent girls with a painful adnexal mass fell below 50% of the occurrence rate and that more than half of these patients had a true ovarian neoplasm requiring differential diagnosis and surgical treatment. An earlier attempt to investigate the adnexal masses of 63 adolescents by Ehren et al. showed that 21% had malignant tumors, 22% had torsion, and benign teratoma was the final diagnosis in 41 (65%) of the patients on whom any exclusion criteria or detailed preoperative evaluation had been applied [2]. Usually, the most common indication for surgery among adolescent patients has been patient and physician preference.

Current experience shows that surgery should often be reserved for persistent cysts that are refractory to medical treatment or expectant management of lesser risk. Hayes-Jordan presented data from young females who had an incidental adnexal mass and concluded that a cyst with 7 cm diameter or smaller pure cystic masses would regress in a 2- to 3-month follow-up period of observation [3].

Nevertheless, in those who had acute pelvic pain even with benign features, it may be prudent to perform surgery via laparoscopy or laparotomy to further treat and define the mass. Significant reduction in complications owing to delay in diagnosis and treatment is an apparent benefit.

In addition, it has been shown that premenarchal girls with an adnexal mass may have an increased risk of ovarian malignancy and need a fast surgical intervention. All girls younger than 9 years old with adnexal masses may have a

35% or more malignant (especially germ cell lesions) ovarian neoplasm rate. Although we found two borderline ovarian tumors in our study population with a mean age of 15.36 ± 1.6 years, fortunately none of the tumors were malignant. Careful selection of appropriate cases for laparoscopic surgery is also important in adolescent girls because there is always a risk of treating an unsuspected ovarian malignancy.

The main difficulty is the identification of early ovarian cancer or borderline ovarian tumors as has been noticed in our series. In the Maiman et al. survey, regardless of patient age, 42 such cases were reported [4]. With the careful selection of the patients in our survey, the diagnosis was suspected in one of the two borderline tumors before laparoscopic surgery, and the patient underwent exploratory laparotomy for accurate staging. The pre-laparoscopic assessment of adnexal mass is more efficient with the newer developments in pelvic imaging, and tumor marker determinations are also useful in selected cases. Without tumor marker determinations, Skiadas et al. reported that 91% were benign, 5.4% ($n=2$) were malign, and 2.7% were borderline tumors in the adnexal masses of 37 adolescent girls [5].

In contrast to Hassans' series that showed at least 50% of adnexal masses were of germ cell origin, our series revealed equal rates for epithelial and germ cell neoplasms for females under the age of 20 [6]. Moreover, ovarian torsion has been reported to be greater in patients with germ cell tumors than in those with epithelial tumors. Since ovarian preservation has been shown possible by accurate management, ovarian torsion in patients with pelvic pain requires an early diagnosis via laparoscopic surgery. Cass et al. demonstrated that 42% of the 59 girls who presented with acute abdominal pain had ovarian torsion [7]. Laparoscopic untwisting had a significant protective effect on ovaries in the Shalev et al. series, which reported that normal ovarian function had been observed in 94.2% of the cases [8].

It is also worth noting that adolescents are also at risk for ectopic pregnancy; one case with an unexpected tubal pregnancy in the 63 adolescent girls of the present series was observed. The absence of any positive bHCG level for tubal pregnancy, as was the case in our patient with an old ectopic pregnancy, can lull the clinician into a false sense of the existence of other pelvic pathologies. The recent introduction of the transvaginal probe has greatly improved the resolution of ultrasonography, but this route may not be an accurate method for preoperative assessment of adolescent pelvic mass in each case. A recent large series by Von Winter et al. documented ultrasonographic imaging and histopathological findings in 521 cases and reported that 92% were benign, including 335 functional and 144 of 186

(77%) true neoplastic lesions, but also 42 malign cases in their series [9].

Although the series of 47 cases previously reported by Deligeoroglou et al. showed 49% were functional, 51% were neoplastic and 4.2% were malignant, we did not detect malign lesions in our series [10]. Therefore, we can argue that these findings probably represent an appropriate preoperative evaluation by ultrasonography and serum tumor markers whenever necessary.

Most authorities agree that the adolescent female presenting with a painful adnexal mass could be an ideal candidate for laparoscopic surgery [11–13]. The overall laparoscopic surgery rate for suspected ovarian neoplasm was 91.8% in our study, which showed that adolescent women were less likely to undergo an emergency laparotomy. Suggested approaches for decreasing the reaction process include using an endobag; copious irrigation of the peritoneal cavity during surgery should be considered in cases even with mucinous cystadenoma of the ovary, which is extremely rare in this age group. Four new cases were encountered in our series. Sri Paran et al. presented six cases with mucinous cystadenoma and concluded that this diagnosis should be considered in adolescent girls presenting with large masses and abdominal discomfort [14].

Although ultrasound-guided aspiration of ovarian cysts has also been recommended for young individuals, our experience has dictated that a painful pelvic mass in more than half of adolescent girls needs mainly laparoscopic evaluation [15]. The present findings directed us to the assessment of neoplastic lesions in such patients. Moreover, it has been shown that adolescents tend to have the same variety of adnexal masses throughout the reproductive period. Comprehensive ultrasonography with pelvic examination and tumor markers holds promise for improving the selection of adolescent patients with painful adnexal masses who could benefit from surgery or bed rest.

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