



Original Article

## Diagnostic Scoring and Surgical Management Outcomes of Acute Adnexal Mass Pathology in the Pediatric, Adolescent and adult Population: A Joint Pediatric, Gynecological, and Surgical Review

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### ABSTRACT

**Background:** Adnexal torsion is the fifth most common gynecologic emergency. The most common ovarian pathologies found in adolescents with adnexal torsion are benign functional ovarian cysts and benign teratomas. **Aims and Objective:** The purpose of this study was done in diagnostic scoring and surgical approach in benign adnexal surgeries performed by surgeons vs. gynecologists at a tertiary care institution, also to analyze the clinical characteristics and surgical management of adnexal masses in children, adolescents and adults. **Material and Methods:** A retrospective study was done on Patients 25 years of age and younger who underwent surgery for an adnexal mass admitted to Madhubani Medical College and Hospital between April 2025 to December 2025 (9 months duration) were collected and analyzed. Patient age, demographic characteristics, menarche status, clinical symptoms, radiologic imaging, timing of surgery, surgeon specialty, mode of surgery, rate of ovarian conservation, and pathology were recorded. Patients were excluded if they had a uterine anomaly or pathology-proven malignancy. **Results:** Pelvic ultrasound with or without color Doppler done in all patients and computed tomography, magnetic resonance imaging was performed in seven patients preoperatively. Adnexal masses were unilateral in 27 (60%) patients and bilateral in 3 (6.66%) patients. Laparoscopy was performed in 18 out of 45 patients. Ovarian cyst torsion was present in 50% patients. Ovarian cystectomy was done in 10 (22.2%) patients. Seven (15.5%) ovaries were saved by detorsion of the ovary and deroofing of the cyst with or without ovarian biopsy. **Conclusion:** Results of our study suggest that gynecologists are more likely to perform ovarian-conserving surgery. However, our sample size precluded precise estimates in our multivariable model. Educational efforts among all pediatric and gynecologic surgeons should emphasize ovarian conservation and fertility preservation whenever possible.

**Keywords:** Adnexal mass; Adnexal torsion; Adolescent and Laparoscopy.

### INTRODUCTION

Adnexal masses are most commonly observed in adults; they rarely occur in children. The majority of the adnexal masses encountered in children or patients of premenarchal age are nonneoplastic lesions. The clinical signs and symptoms of adnexal masses are usually nonspecific. Early management is necessary to preserve fertility [1]. Ovarian cysts are the most common causes of intra-abdominal cysts detected antenatal by ultrasound (US) studies.[2] Nussbaum *et al.*[3] classified them as simple or uncomplicated and complex or complicated cysts suggesting ovarian torsion. Controversy remains regarding the best treatment for these cysts ranging from observation, aspiration to surgical exploration in cyst <5 cm. Ovarian tumors in children account for only 1% of childhood malignancies [4]. We share our experience in managing these

ovarian masses in pediatric and adolescent age group patients. The most frequent ovarian masses in a pediatric and adolescent population are benign neoplasms and functional cysts, both of which can be causes for ovarian torsion [5]. Malignancies in this population are usually germ cell tumors, which contrast the adult population, which are more commonly the result of epithelial cell malignancies [6]. In the United States, tumors of the female genital tract in adolescents and children are uncommon, with an incidence of 2.6 cases per 100,000 girls annually [7].

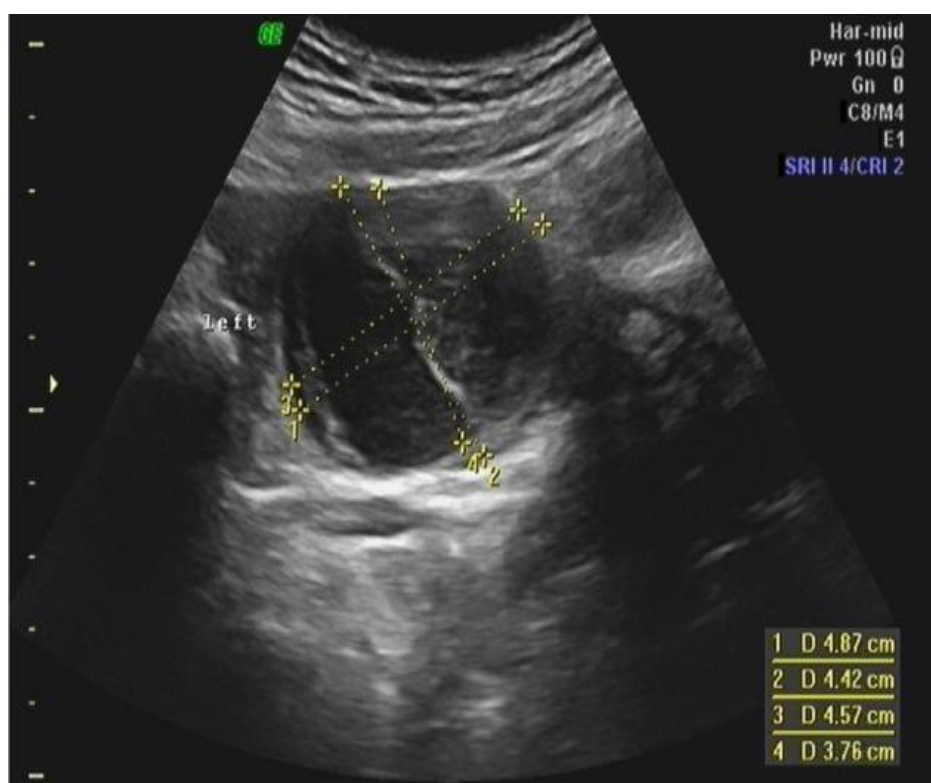
The majority of ovarian lesions are benign or physiologic, although ovarian malignancy in adolescents and children accounts for 10–20% of all ovarian masses and 1–2% of all pediatric cancers [8]. Adnexal torsion is an uncommon cause of acute abdominal pain in pediatric and adolescent females, and affects approximately 4.9 out of 100,000 children each year [9]. Torsion of the ovary and pedicle are gynecologic emergencies [10]. If left untreated, they have the potential to cause adnexal necrosis, venous congestion and lifelong reduced fertility [11]

## AIMS AND OBJECTIVE

The purpose of this study was done in diagnostic scoring and surgical approach in benign adnexal surgeries performed by surgeons vs. gynecologists at a tertiary care institution, also to analyze the clinical characteristics and surgical management of adnexal masses in children, adolescents and adults.

## MATERIAL AND METHODS

A retrospective study was done on Patients 25 years of age and younger who underwent surgery for an adnexal mass admitted to Madhubani Medical College and Hospital between April 2025 to December 2025 (9 months duration) were collected and analyzed. Patient age, demographic characteristics, menarche status, clinical symptoms, radiologic imaging, timing of surgery, surgeon specialty, mode of surgery, rate of ovarian conservation, and pathology were recorded. Patients were excluded if they had a uterine anomaly or pathology-proven malignancy. Clinical presentation, imaging (IOTA classification), surgical details, and pathology were analyzed. A comparative analysis between torsion (n=18) and non-torsion (n=16) groups was performed, followed by multivariate logistic regression to identify independent predictors of torsion.



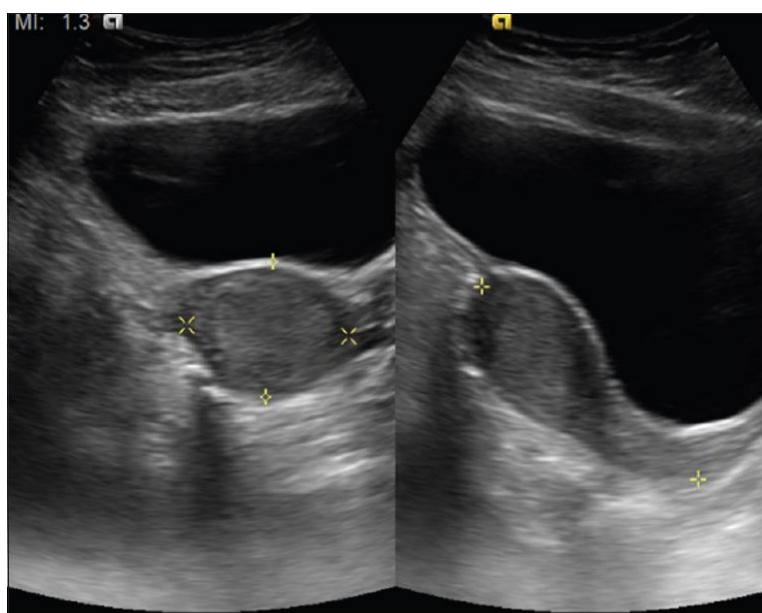
**Fig:-1 Assessment of adnexal masses using ultrasound**

MRI and CT are both helpful tools for evaluating adnexal masses in addition to the Ultrasonography. MRI was selected as the second-line diagnostic method because it provides a higher soft tissue resolution. Due to its ability to thoroughly examine the pelvic side wall and surrounding organs for involvement, MRI is more beneficial than CT for further identifying ovarian masses and for the loco regional staging of malignant tumors. It is more challenging to complete the MR imaging test in emergency cases because it takes longer and younger patients may require anesthesia.

## POTENTIAL PATHOLOGIES



**Fig: -2** Excised specimen of the solid ovarian mass (Juvenile granulosa cell tumor)



**Fig: -3** Pelvic ultrasound showing right-sided hypoechoic enlarged ovary with no internal vascularity suggestive of torsion

### INCLUSION CRITERIA:

Patients presenting with sudden or severe pelvic/abdominal pain, imaging-confirmed adnexal lesions, and clinical signs of complications (e.g., torsion, rupture, or hemorrhage). Pediatric and adolescent cases prioritize ovary-preserving, minimally invasive techniques to protect future fertility

### EXCLUSION CRITERIA:

1. Postmenopausal women with ovarian masses. 2. Age more than 25 years.

### STATISTICAL ANALYSIS

Data was entered in MS excel and analyzed using SPSS version 17. Descriptive studies of mortality and complications were analyzed and presented in terms of Percentages. Chi-Square Test was used to compare the proportion of death and complications between the groups.

## RESULTS

The age ranged 25 years and below, abdominal pain, nausea with vomiting, and abdominal lump was the most common presenting complaints. Pelvic ultrasound with or without color Doppler done in all patients and computed tomography, magnetic resonance imaging was performed in seven patients preoperatively. Adnexal masses were unilateral in 27 (60%) patients and bilateral in 3 (6.66%) patients. 4 babies had antenatal diagnosis of ovarian cysts. Serum alpha fetoprotein (AFP) and beta-human chorionic gonadotropin (b-HCG) were normal in all 19 tested patients. Cancer antigen 125 (CA-125) was raised in three ovarian tumors out of 9 tested patients. Laparoscopy was performed in 18 out of 45 patients. Ovarian cyst torsion was present in 50% patients. Ovarian cystectomy was done in 10 (22.2%) patients. Seven (15.5%) ovaries were saved by detorsion of the ovary and deroofting of the cyst with or without ovarian biopsy.

Oophorectomy was done in eight (17.7%) patients. Salpingo-oophorectomy had to be done in nine (20%) patients. Histopathology revealed functional nonneoplastic lesions in 18 cases (40%), benign neoplastic lesions in 16 cases (35.5%), and malignant neoplastic lesion in 1 case (2.2%).

## DISCUSSION

In recent years, several studies have begun to focus on the surgeries to preserve ovarian function as opposed to oophorectomy for ovarian lesions and ovarian torsion [12]. Many studies have analyzed the long-term consequences, specifically ovarian reserve in benign lesions and survival in tumors that were later found to include malignancy [12, 13]. However, it has been demonstrated that even this conservative approach can diminish the ovarian reserve to some degree. This damage is associated with a number of parameters, including tumor size and laterality, the laparoscopic technique (tissue handling), histology, and use of hemostatic techniques electrocoagulation. Although laparoscopic ovarian-sparing lesion removal has become more common in recent years, there is still no consensus that this is the standard of care for children and adolescents in the Concern arises about the possibility of tumor rupture, particularly in cases where a malignancy may not be identified prior to surgery [14].

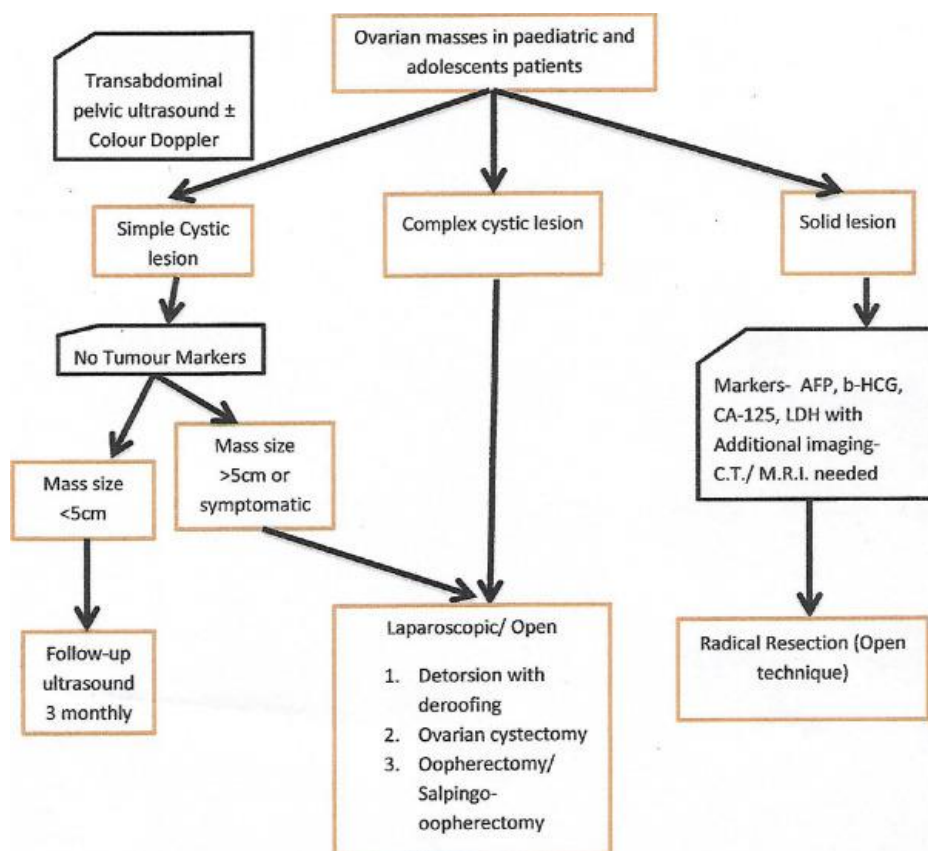


Fig:-4 Management algorithm for ovarian masses in pediatric and adolescent patients

## CONCLUSION:

In conclusion, gynecologic surgeons may be associated with better surgical outcomes with a higher incidence of fertility preservation than pediatric surgeons in the surgical management of pediatric and adolescent female patients with ovarian masses.

Adnexal masses in children include a broad array of pathologic diagnoses that have variable clinical presentations. In our series, majority of patients present either in infants <6 months age group or near puberty. The most common pathology in our series was ovarian cyst undergoing torsion. AFP, b-HCG, and CA-125 are normal in all our cases of ovarian torsion, so we can avoid doing these tests in cases of ovarian torsion. Gynecologic surgeons showed lower rates of complications, oophorectomies, conversion to laparotomies, and higher rates of OSS. Consideration must be given that these results cannot judge any specific surgeon or clinical scenario, and did take into consideration specific fellowships or board certifications. Practically, these results support considering gynecologic surgeons for managing pediatric adnexal masses to potentially improve fertility preservation and reduce complications.

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