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Original Research Article

## Acute abdomen with adnexal masses in the reproductive age group: diagnosis and management

Anuradha D. Murki<sup>1\*</sup>, Vasundhara Kamineni<sup>1</sup>, Sowmya R. Velagapudi<sup>1</sup>, Ashok K. Deshpande<sup>2</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, Kamineni Academy of Medical Sciences and Research Centre LB Nagar, Hyderabad, Telangana, India

<sup>2</sup>Department of Pathology, Kamineni Academy of Medical Sciences and Research Centre LB Nagar, Hyderabad, Telangana, India

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**\*Correspondence:**

Dr. Anuradha D. Murki,

E-mail: [dogiparthi\\_anu@yahoo.com](mailto:dogiparthi_anu@yahoo.com)

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### ABSTRACT

**Background:** Women with adnexal masses can present with acute symptoms such as abdominal pain, nausea and vomiting. As there is insufficient evidence on the frequency, presentation and management of adnexal masses we conducted this study to evaluate the clinical profile, surgical findings and histopathology of adnexal masses in women presenting with acute abdomen and needing surgical intervention.

**Methods:** In this prospective observational study, history, examination, investigations and ultrasound of abdomen and pelvis were evaluated in women presenting with acute abdomen with adnexal mass and needing surgical intervention. Diagnosis was confirmed from the operative findings and histopathology. Etiology and its correlation with clinical symptoms and signs and radiological diagnosis formed the primary objective of the study.

**Results:** Of the 79 patients enrolled in the study, the mean age was  $30.82 \pm 6.69$  years. Younger women were likely to have ectopic pregnancy while older women (>35 years) other tubal pathologies. Pain abdomen (n=70) and nausea (n=53), bleeding per vagina (n=33), menstrual irregularities (n=18), fever (n=10) abdominal distension (n=10) and dysuria (4) were the common symptoms. Etiology of the adnexal mass was ectopic pregnancy (57%), ovarian mass (34%), tubal mass (7.5%), tube and ovary (2.5%) in 46, 25, 6 and 2 patients respectively. 61% (n=48) of the women underwent laparoscopic management. Women with ruptured ectopic pregnancy were more likely to have abdominal distension, pallor, hypotension, cervical motion tenderness and need for blood transfusions.

**Conclusions:** In women from reproductive age group with adnexal mass and needing surgery, ectopic pregnancies and benign ovarian tumours were the common etiologies. Urine pregnancy test and ultrasound are useful tests to differentiate ectopic from ovarian and tubal pathology.

**Keywords:** Adnexa, Ectopic pregnancy, Reproductive age

### INTRODUCTION

The adnexa of the uterus include the ovaries, fallopian tubes and the structures of the broad ligament. Adnexal masses refer to the ovarian masses or cysts; however, para-tubal cysts, hydrosalpinx, and other non-ovarian masses, pregnancy related conditions like ectopic pregnancy are also included. Women with adnexal masses can present with acute symptoms such as

abdominal pain, nausea and vomiting.<sup>1</sup> Adnexal torsion, which refers to complete or partial rotation of the adnexa, resulting in obstruction of venous and lymphatic reflux in the ovary, is a common gynecological emergency. Many varied gynecologic conditions can clinically mimic adnexal torsion. These include tubo-ovarian abscesses, endometriomas, appendicitis, and ruptured ovarian cysts. Clinical diagnosis of adnexal masses is based on symptoms and examination, but it can be challenging if

there is torsion of normal adnexa and when pelvic examination is not possible in unmarried women. According to Russell, pelvic examination with its possible limitations, such as examiner experience, patient obesity, patient anxiety, or symptomatology, has never been, assessed systematically.<sup>2</sup> Ultrasound is the most common initial approach for diagnosis of adnexal mass with doppler flow to rule out torsion. Early diagnosis and intervention are essential to conserve the ovarian function. Imaging helps in diagnosis but most of adnexal masses are diagnosed intra operatively. Laparoscopic conservative surgery is the preferred surgical approach especially in younger age groups.

As there is insufficient evidence on the frequency, presentation and management of adnexal masses authors conducted this study to evaluate the clinical profile, surgical findings and histopathology of adnexal masses in women presenting with acute abdomen and needing surgical intervention.

**METHODS**

This prospective observational study was conducted from August 2017 to May 2019 at department of gynecology and obstetrics, Kamineni Hospital, Hyderabad, Telangana, India. Women who presented with acute abdomen with were evaluated by history, clinical examination, pelvic exam if needed and an emergency ultrasound. All patients diagnosed with adnexal mass and needing operative intervention were enrolled in the study. Consent was obtained from the patient before inclusion in the study.

The study was approved by study institute ethics committee. Those patients with non-gynecological adnexal masses, those needing conservative therapy and those with pelvic masses arising from the uterus were excluded.

Among the patients enrolled in the study the data collected included;

- Demographic data and detailed clinical history including menstrual, obstetric, and past history

- Clinical examination findings
- Ultrasound findings
- Laboratory findings
- Management and treatment decisions
- Intraoperative findings
- Histopathological reports and final diagnosis.

Assuming 5.3% incidence of adnexal masses in women presenting with the above symptoms and with a precision of 5%, a loss of 20% for patient data or incomplete data, authors planned to enroll 72 patients in the study. Descriptive statistics were used in the study.

**RESULTS**

Of the 79 patients enrolled in the study, the mean age of subjects was 30.82±6.69 years. Majority of subjects were in the age group 20 to 30 years (54.4%) (Table 1).

A total 97.5% were married, 48.1% were multigravida, 81% had regular menstrual cycles. Pain abdomen (n=70) and nausea (n=53) were the common clinical symptoms and in the order of decreasing frequency the other symptoms were bleeding per vagina (n=33), menstrual irregularities (n=18), fever (n=10) abdominal distension (n=10) and dysuria.<sup>4</sup> Previous surgery history was present in 28 patients (35%).

On clinical examination, pallor was noted in 12 patients, unstable vitals in 11 patients (6 of these had hypotension), abdominal distension in 10 and abdominal tenderness in 57 patients. Among the patients with abdominal tenderness it was diffuse in 17 patients, right sided in 28 and left sided in 12 patients. On per speculum examination, bleeding was noted in 11 patients, cervical hypertrophy and cervical erosion was seen in one patient each.

Vaginitis was noted in 2 patients. Pelvic examination confirmed mass in all patients, and it was right sided in 42 patients, cervical motion tenderness was noted in 53 patients and forniceal tenderness was elicited on both sides in 36 patients, right sided tenderness in 19 and left sided tenderness in 10 other patients

**Table 1: Association between age and diagnosis.**

		Diagnosis					
		Ectopic pregnancy		Ovarian cyst		Tubal pathology	
		Count	%	Count	%	Count	%
Age	20 to 24 years	8	53.3%	7	46.7%	0	0.0%
	25 to 30 years	23	82.1%	5	17.9%	0	0.0%
	31 to 35 years	10	71.4%	3	21.4%	1	7.1%
	36 to 40 years	5	26.3%	8	42.1%	6	31.6%
	>40 years	0	0.0%	3	100.0%	0	0.0%

$\chi^2 = 31.43, df = 8, p < 0.001^*$ .

**Table 2: Intraoperative diagnosis.**

		Count	%
Ectopic	Ruptured	36	77.7%
	Unruptured	10	22.2%
	Total	46	100.0%
Ovarian pathology	Without torsion or rupture	3	15.5%
	Rupture	3	11.5%
	Torsion	19	73.0%
	Total	25	100.0%
Tubal pathology	Hydrosalpinx torsion	3	42.8%
	Pyosalpinx	1	14.3%
	Torsion tubo-ovarian mass	2	28.6%
	Tubo-ovarian abscess	2	28.6%
	Total	8	100%

**Table 3: Histopathological examination of the adnexal mass.**

HPE	No. of patient	%
<b>1. Ectopic pregnancy</b>		
Tubal ectopic	45	55.6%
Interstitial ectopic	1	1.2%
<b>2. Torsion</b>		
a. Ovarian cysts		
Simple cysts	8	10.1%
Haemorrhagic cysts	8	10.1%
Dermoid cysts	2	2.5%
Endometriotic cysts	2	2.5%
Paraovarian cyst	1	1.2%
b. Enlarged ovary	1	1.2%
c. Hydrosalpinx	3	3.7%
d. Tubo-ovarian mass	2	2.5%
<b>3. Rupture of ovarian cysts</b>		
Simple cyst	1	1.2%
Haemorrhagic ovarian cyst	1	1.2%
4. Tubo-ovarian abscess	2	2.5%
5. Pyosalpinx	1	1.2%
6. Para ovarian cyst	1	1.2%
7. Simple ovarian cyst	1	1.2%

Gravindex was positive in 47 patients (59%) and diagnosis of the adnexal mass was ectopic pregnancy (57%), ovarian mass (34%), tubal mass (7.5%), torsion tube and ovary (2.5%) in 46, 25, 6 and 2 patients respectively. Forty-nine, 28 and 2 patients had adnexal mass that measured <5 cm, 6-10 cm and >10 cm respectively. Younger women were more likely to have ectopic pregnancy while older women (>35 years) were likely to other tubal pathologies. However Ovarian masses were equally distributed across all study age groups (table). In the management, 61% (n=48) of the women underwent laparoscopic procedures and, in the rest, it was laparotomy. 35 of the ectopic pregnancies were ruptured, 19 and 3 of the 26 ovarian cysts had

torsion and rupture respectively and 5 of tubo-ovarian masses had torsion (Table 2).

In-operative findings confirmed the mass on right side in 41 patients and bilateral mass in one patient. Hemoperitoneum was noted in 31 patients indicating rupture of the mass or a torsion. On the histopathology, 1 of the 46 ectopic pregnancy was a interstitial and the rest was tubal. The most common reason for torsion was a simple cyst and a haemorrhagic ovarian cyst (Table 2, Table 3).

**Table 4: Comparison of ruptured and un-ruptured ectopic pregnancy.**

	Ruptured N=36	Un-ruptured N=10
Pain abdomen	36	10
Abdominal distension	6 (16%)	0 (0.0%)
Bleeding per vaginum	19 (53%)	8 (80%)
Menstrual irregularities	3 (12%)	2 (20%)
Previous surgery	11 (30.5%)	3 (30%)
Pallor	11 (30.5%)	1 (10%)
Tachycardia or hypotension	7 (19.4%)	1 (tachycardia)
Cervical motion tenderness	29 (80.5%)	5 (50%)
Ultrasound		
Free fluid	33 (91.6%)	7 (70%)
Moderate to massive fluid	18 (50%)	2 (20%)
Laparoscopy	18 (50%)	9 (90%)
Blood transfusion	13 (36.1%)	0 (0.0%)
2 transfusions	3	
3 transfusions	2	
Duration of stay	3 to 7 days	3 to 5 days

A total 93.6% (n=74) patients had hospital stay for less than 5 days and 6.3% had hospital stay for more than 5 days. The hospital course was uncomplicated in most

women, 13 (16.4%) women required blood transfusion and post-operative wound infection was present in 4 women.

All women with ectopic pregnancy had Gravindex positive. Fourteen of the women with ectopic pregnancy had a previous abdominal/pelvic surgical history, 9 had history of previous sterilization and 1 had tubal re-canalization. Two women also had recurrence of ectopic pregnancy. Women with ruptured ectopic pregnancy were more likely to have abdominal distension, pallor, hypotension, cervical motion tenderness and need for blood transfusions (Table 4). Laparoscopy was the mode of surgery in all women with unruptured ectopic except one.

Among the women with ovarian or tubo-ovarian masses, 24 had torsion of the ovarian or the mass. Ultrasound did not identify torsion in 2 of these 24 women. One of the women had torsion of the ovarian in her 12<sup>th</sup> week of pregnancy. Laparoscopy was the mode of surgery in 18 (75%) of the 24 patients with torsion.

## DISCUSSION

Among the 79 women with adnexal mass presenting as acute abdomen and needing operative intervention, the most common cause was ectopic pregnancy and it was followed with either torsion or rupture of ovarian mass. The etiology of adnexal mass is more likely to be related to the age and facility of presentation. In women with reproductive age, after excluding pregnancy, ovarian mass is the most common cause for adnexal mass presenting as an emergency. In a study by Al-Shukri et al, of the 57 women operated for adnexal masses as emergency (pregnancy excluded), the most common pathology was teratoma 26% (15/57) followed by corpus luteal haemorrhage (16%) and endometriosis (14%).<sup>3</sup> In another study by Bhagde et al, among 50 women presenting with adnexal mass in the reproductive age group, most common site of origin of adnexal masses was the ovary and in the order of decreasing frequency these masses were mucinous cyst adenoma (20%), benign and mature cystic teratoma (16% and 6%) and serous cyst adenoma (10%).<sup>4</sup> In a study from southern India, among women presenting with adnexal torsions, serous and mucinous ovarian cysts contributed to 50% of the patients.<sup>5</sup> In this study simple and hemorrhagic ovarian cysts were the most common reasons after excluding ectopic pregnancy.

Like most other studies, abdominal pain, nausea/vomiting, bleeding per vaginum, cervical tenderness and palpable mass on vaginal examination are the common symptoms and signs in women with adnexal masses.<sup>5-7</sup> Urine gravindex test should be mandatory in all women presenting with adnexal mass. This test is useful to differentiate ectopic pregnancy from other adnexal masses and is also positive even in women with tubal ligations. Ultrasound has high sensitivity in

differentiating all adnexal masses.<sup>7</sup> In this study 20% of the women with ectopic pregnancy had tubal ligation. Previous surgical history was present in 14 women with ectopic pregnancy (30%). Amenorrhea is not a useful indicator for ectopic pregnancy as 27 of the 46 women had bleeding per vaginum in this study. In a study on ectopic pregnancies in 50 women from central India 6, bleeding per vaginum was noted in 43%, previous abdominal/pelvic surgery history in 30% and ectopic pregnancy occurred in 3 women (6%) after tubal ligation. In this study rupture was noted in 78% of ectopic pregnancy and it was noted in 92% of patients reported by Shrivastasa et al. In an old study published from Calcutta, 8 among 158 women with ectopic pregnancy, rupture was noted in only 22% and history of previous tubal ligation was present in only one case. Authors noted pallor, hypotension, abdominal distension and ultrasound findings of moderate to massive pelvic fluid are useful markers of rupture in ectopic pregnancy.

Exploratory laparotomy used to be the standard treatment option for women presenting with adnexal mass as an emergency.<sup>6,8</sup> However as seen in this study and many other recent publications most cases of adnexal masses are managed with laparoscopy.<sup>9,10</sup> In a study on 174 women operated on for an adnexal mass (excluding pregnancy), surgeons selected 58 of those for laparoscopy. Forty (69%) laparoscopies were considered successful and 18 (31%) were considered failures. The reasons for the 18 failures were 9 laparoscopies with malignant tumors, 5 converted to laparotomy because of intraoperative complications, and 4 converted to laparotomy because of a large tumor. Only tumor diameter >7 cm was associated with laparoscopy failure (OR, 10.3, 95% CI, 2.47-42.95, p<0.01).<sup>9</sup> In a study from Taiwan, among 42 women with adnexal torsion, laparoscopy was the preferred surgical mode in 27 women (64%). Laparoscopy resulted in lesser hospital stay.<sup>11</sup> In a study comparing laparoscopy versus laparotomy for management of ectopic pregnancy, laparoscopy resulted in lesser operative time and lesser hospital stay.<sup>12</sup>

## CONCLUSION

In women from reproductive age with adnexal mass and needing surgery, ectopic pregnancy and benign ovarian cysts are the common etiologies. Urine Gravindex test and ultrasound are the useful tests to differentiate ectopic from ovarian or other tubal pathologies. Pallor, hypotension, abdominal distension, moderate to massive pelvic fluid are useful markers of ruptured ectopic pregnancy. Laparoscopy is a useful surgical modality for all women presenting with adnexal mass as an emergency.

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