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# Analysis of ovarian torsion in a rural tertiary care centre

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**Abstract**
**Background:** Ovarian torsion refers to the complete or partial rotation of the ovary. It is one of the most common gynecologic surgical emergencies affecting all ages. Early diagnosis can help prevent irreversible damage to ovary. Objective of this study was to analyze the clinical, and pathological characteristics of surgically proven cases of ovarian torsion at a tertiary care centre.
**Methods:** This retrospective study was carried out from January 2016 to October 2019. Medical records of 20 cases of adnexal torsion were selected and analyzed retrospectively for age, parity, risk factors, clinical presentation, ultrasound and color Doppler features, management, pathological results and post-operative outcome.
**Results:** A total of 20 patients with ovarian torsion were identified. Most commonly ovarian torsion was seen in reproductive age group (mean age of 31.4yrs) and in multiparous women (70%). More than 75% of the cases were associated with risk factors. Common presenting symptoms were sudden onset abdominal or pelvic pain (100%), vomiting (80%) and fever (40%). Ultrasonogram had various findings like mixed echogenic mass (35%), homogenously echogenic cyst (45%) anechoic cyst (20%) and free fluid (20%). Doppler studies showed absent arterial and venous flow in 25% of the cases. Cases were managed by detorsion & cystectomy (15%), unilateral salpingooophorectomy (70%), bilateral salpingooophorectomy (10%) and TAH with BSO (5%). Histopathology revealed benign serous epithelial tumors (40%), mucinous tumors (25%), mature teratoma (5%), corpus luteal cyst (10%), Para ovarian cyst (10%), gangrenous cyst (10%).
**Conclusions:** Adnexal torsion is one of the gynecologic emergencies. Most of the findings in our study are reconfirmation of the pre-existing data based on a large number. However, we believe that area-specific information of this condition is mandatory for the medico-policy making in this institute. This data also reemphasizes the importance that the emergency physicians should have high index of concern/suspicion of ovarian tumor torsion when they encountered acute abdomen in women.

**Keywords:** Ovarian torsion, rural tertiary, gynecologic surgical

## Introduction

Adnexal torsion, including torsion of a normal or pathologic ovary, torsion of the fallopian tube, Para tubal cyst, or a combination of these conditions, is one of the common gynaecologic surgical emergencies. It is defined as twisting of the ovary, fallopian tube, or adnexal mass. Torsion of the ovary, tube or both is responsible for 2.7% to 7.4% of all gynaecological emergencies [1].

It most commonly occurs in women of reproductive age (including during pregnancy). However, pre-pubertal girls and postmenopausal women can also be affected. Risk factors for ovarian torsion include ipsilateral adnexal mass >5 cm, pregnancy, ovulation induction, PCOS, prior tubal ligation and hyper mobility of adnexal structures [2].

Ovarian torsion usually occurs when an enlarging ovarian cyst or mass rotates both the infundibulopelvic ligament and the UO ligament. It can also occur in patients with normal ovaries, particularly in premenarchal girls who have elongated infundibulopelvic ligaments [3, 4].

Clinically patient presents with sudden onset of pelvic or abdominal pain, accompanied by nausea and vomiting. Signs include pyrexia, tachycardia, generalized abdominal tenderness, tender mass in adnexa, guarding and rebound tenderness. Chance of salvaging viable ovary markedly decreases if symptoms have persisted for more than 48 hours [5]. Ultrasound is the initial imaging modality of choice for diagnosing ovarian torsion. The spectrum of ultrasound features depends on degree of vascular compromise. Colour doppler should be done to assess the blood flow and viability of the ovaries.

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When ultrasound findings in patient with suspected ovarian torsion are inconclusive, computerised tomography or magnetic resonance imaging may be helpful with good negative predictive value [6, 7].

Diagnosis of ovarian torsion can be difficult, since it has varied clinical presentation and the differential diagnosis can include several other gynecological and surgical emergencies. Familiarity with the common presenting symptoms of torsion, in combination with ultrasound and other imaging modalities is important for maintaining a high index of suspicion among emergency staff, to enable swift and accurate diagnosis and an appropriate management strategy.

Surgical intervention is the gold standard for diagnosis and treatment of adnexal torsion. Conventionally, twisted ovary or adnexa is excised completely. However, adnexa-sparing surgery has emerged as an alternative. Conservative surgery such as detorsion with cystectomy or cyst aspiration is preferred to preserve adnexal function [8, 9, 10].

Although ovarian torsion is already well characterized, to obtain institute-specific data is important to future making medico-gynaecological policy in our institute. Thus, we here attempted to determine this issue by analysing cases with ovarian torsion that we treated recently.

## Methods

This retrospective study included all the women diagnosed with surgically proven adnexal torsion from January 2016 to October 2019. Medical records of cases of adnexal torsion were selected and analysed retrospectively for age, parity, risk factor, clinical presentation, ultrasound and Doppler features, management and pathological results.

## Results

**Table 1:** Distribution of age

| Age (years) | Number of cases | % |
|---|---|---|
| 15-20 | 4 | 20 |
| 21-30 | 7 | 35 |
| 31-40 | 7 | 35 |
| 41-50 | 1 | 5% |
| 51-60 | 1 | 5% |

Total cases included in the study were 20. Age ranged from 15 to 60 years. Mean age was 31.4 years. Majority 19 (90%) cases belonged to reproductive age, 2 (10%) cases were in menopausal age group

**Table 2:** Distribution of parity

| Parity | No of cases | % |
|---|---|---|
| Nulligravida | 2 | 10 |
| Primipara | 4 | 20 |
| Multipara | 14 | 70 |

Out of the 20 cases, 14 were multipara (70%), 4 were primipara (20%) and 2 were nulligravida (10%). The mean parity was 2.

**Table 3:** Distribution of risk factors

| Risk factors | Number of cases | % |
|---|---|---|
| Poly cystic ovarian disease | 3 | 15 |
| Previous pelvic surgeries | 6 | 30 |
| Pre-existing ovarian cyst | 4 | 20 |
| Pregnancy | 1 | 5 |
| Post-partum sterilization | 6 | 30 |

Most of the cases were having risk factors predisposing to ovarian torsion. 30% had pre-existing pelvic surgeries, 30% had postpartum sterilisation, 20% had pre-existing ovarian cyst, 15% had poly cystic ovarian disease. Pregnancy accounted as risk factor only for 5% of the cases.

**Table 4:** Clinical features

| Symptoms and signs | Number of cases | % |
|---|---|---|
| Abdominal pain | 20 | 100 |
| Nausea & vomiting | 16 | 80 |
| Fever | 8 | 40 |
| Abdominal distension with tender abdominal mass | 2 | 10 |

All the patients had abdominal pain as the presenting symptom. Apart from abdominal pain, 80% of cases had nausea & vomiting. Fever was seen in 40% of the cases. Abdominal distension with tender abdominal mass was seen in 10% of the cases.

**Table 5:** Ultrasound features

| Ultrasound features | Number of cases | % |
|---|---|---|
| Mixed echogenic mass | 7 | 35 |
| Homogenously echoic cyst | 9 | 45 |
| Anechoic cyst | 4 | 20 |
| Free fluid | 4 | 20 |
| Absent arterial & venous flow | 5 | 25 |
| Right ovary involvement | 12 | 60 |
| Left ovary involvement | 8 | 40 |

Of the 20 cases, 7 (35%) of them had mixed echogenic mass and 9 (45%) had homogenously echoic cysts. Anechoic cysts were found in 4 cases (20%) on sonogram and absent arterial and venous flow was noted in 25% of the cases and 20% had free fluid in the abdominal and pelvic cavity. Right ovary was affected in 60% of the cases and left ovary was affected in 40% of the cases.

**Table 6:** Surgical procedures

| Surgery done | Number of cases | % |
|---|---|---|
| Unilateral salpingo-oophorectomy | 14 | 70 |
| Bilateral salpingo-oophorectomy | 2 | 10 |
| TAH with BSO | 1 | 5 |
| De-rotation and cystectomy | 3 | 15 |

Most of the cases (14) underwent unilateral salpingo-oophorectomy (70%). Bilateral salpingo-oophorectomy was done in 2 cases (10%). TAH with BSO was done in 1 case (5%) and de-rotation with cystectomy was done in 3 cases (15%). Tumours ranged in size from 5-15cm with majority having a maximal diameter ranging from 6-10cm (67.37%).

**Table 7:** Ovarian torsion histopathology

| Histopathology | Number of cases | % |
|---|---|---|
| Benign serous cystadenoma | 6 | 30 |
| Benign serous papillary cystadenoma | 2 | 10 |
| Benign mucinous cystadenoma | 5 | 25 |
| Mature cystic teratoma | 1 | 5 |
| Para ovarian cyst | 2 | 10 |
| Corpous luteal cyst | 2 | 10 |
| Gangrenous cyst | 2 | 10 |

Out of 20 cases, 8 (40%) were benign serous cystadenoma, 5 (25%) were benign mucinous cystadenoma, 2 (10%) each were

para ovarian cyst and corpous luteal cyst. One (5%) was mature cystic teratoma and 2 (10%) were gangrenous cysts.

## Discussion

Adnexal torsion is a fifth most surgical emergency condition with prevalence of 2.7% [11]. To preserve vascularity and to prevent ovarian necrosis, early accurate diagnosis and timely intervention are required. In our study, 70% of the cases had risk factors. Most common risk factors were prior pelvic surgery (30%) and tubal ligation (30%). The findings were very similar to a study conducted by Houry *et al*. [12] in 87 women with ovarian torsion, where 40% of the cases had prior pelvic surgery and 21% of them had prior tubal ligation. Pregnancy also was associated with increased risk of ovarian torsion accounting for 10% of cases of ovarian torsion in our study, comparable to a study conducted by Houry *et al.* and White *et al.* which accounted for 10 to 22% of the cases in a series of 80 patients [12, 13].

Torsion of ovarian mainly occurs in reproductive age group. In the present study, 90% were in reproductive age group (15-49 years), similar to study conducted by Houry *et al.* and White *et al*. [12, 13]. In the present study torsion in menopausal age women accounted for 5% of the cases.

Most of our patients were parous, 12 multiparas (70%), 4 primipara (20%) and 2 nulligravida (10%). A study by Gerome Descargues *et al*. showed higher rate in nulligravida 42% [14]. This is due to the fact that most of the women in India have an earlier age at marriage and reluctantly accept family planning.

Clinical presentations of patients in our study were similar to those described in multiple other studies [12, 13]. Abdominal pain (100%) was the most common presenting symptom followed by vomiting (80%) and fever (40%). abdominal distension and tender abdominal mass were seen in 10% of the cases.

In our study, right side ovarian torsion (60%) was more common than left side in (40%). Similar finding was also shown on a study conducted by Vijayalaskshmi *et al*. [10]. This could be because of long right ovarian ligament or presence of sigmoid on the left side.

Ultrasound is the initial imaging study of choice for patients with suspected ovarian torsion. Ultrasound is less expensive Than CT and MRI and its diagnostic performance is similar. In our study all the cases had cystic lesion with no normal adnexa. On ultrasound and average cyst size ranged from 5-15cm. In a study done by Libby *et al*. [15] in 2004, cystic lesion was seen in 80% of the cases and normal adnexa in 15% on USG. Doppler showed, absent flow in 5 cases (25%) but it was present in the rest 75% percent of the cases. The finding was similar to by Shadinnder *et al*. [16] in 2008 and they concluded that suspicion of ovarian torsion should be high even in the absence of Doppler finding based on the clinical finding.

Oelsner *et al*. [17] conducted a study of ovarian torsion in 2006, and concluded that despite necrotic appearance of twisted ischemic ovary, only detorsion can be done, as ovarian function is preserved in 88-100% cases. Houry *et al*. [12] in 2001 had shown ovarian salvage rate of 9% in 87 cases. White *et al.* had achieved detorsion in 13% of 52 cases [13]. In the present study, detorsion and cystectomy was achieved in 15% cases which is even better than previous 2 studies. However, no cases were managed by detorsion alone. 70% of the cases underwent unilateral salphingoophorectmy, 10% bilateral salpingoophorectomy (BSO) and 5% underwent total abdominal hysterectomy with BSO.

On histopathology examination, benign conditions were more common. The most common benign tumor was serous cyst adenoma (40%) followed by mucinous cyst adenoma (25%) followed by para ovarian cyst and corpus luteal cyst 10% each and 5% due to mature cystic teratoma. This is in contrast to study by Libby *et al*. [15] in 2004 where mature teratoma was the most common tumor associated with torsion accounting for 30%. Difference may be due to higher incidence of serous tumors in our population.

## Conclusion

Diagnosis of adnexal torsion is a challenge to both clinician and radiologist due to its nonspecific clinical and radiological findings. Almost all findings here made are reconfirmation of the pre-existing data based on a large number; however, we believe that area-specific information of this condition is mandatory for the medico-policy making in this area/institute. This data also reemphasizes the importance that the emergency physicians should have high index of concern/suspicion of ovarian torsion when they encounter acute abdomen in women. And preservation of the ovary should be the main concern of the surgeon unless and until it is gangrenous as ovarian torsion commonly is seen in reproductive age group.

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