



## Original research

## Differentiated therapy in pre- and postmenopausal adnexal torsion based on malignancy rates: A retrospective multicentre study over five years



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## HIGHLIGHTS

- Adnexal torsion (AT) is a rarely seen event in postmenopausal women.
- The malignancy rate in postmenopausal women accounts for 16% of all cases with AT.
- The management of AT should be different between pre and postmenopausal women.

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## ABSTRACT

**Introduction:** The purpose of this study was to investigate the clinical presentation, intra and post-operative outcomes in pre and postmenopausal women who underwent operations for adnexal torsion, and to define our experience diagnosing and managing postmenopausal women with adnexal torsion.

**Methods:** One hundred and fifty-seven patients who underwent operation with a diagnosis of adnexal torsion were analyzed according to demographic characteristics, menopausal status, preoperative signs and symptoms, surgical findings and applied surgical procedures, and pathological results in four tertiary centers.

**Results:** The main indication for surgery for the postmenopausal women was pelvic mass (58% vs. 40%), while for premenopausal women the main indication was suspicion of torsion (55% vs. 24%), (each  $p < 0.001$ ). The duration of time between being admitted to the hospital and entering operating room as well as the duration of surgery and postoperative hospitalization were statistically longer in the postmenopausal group (each  $p < 0.001$ ). While extensive surgeries were performed for 68% of the postmenopausal group, this was required for only 3% of the premenopausal group. Functional cysts were the most common pathologic finding in premenopausal women, and only 2 cases of malignancy (1.6%) were seen as opposed to the postmenopausal group, where malignancy was diagnosed in 16% of cases ( $p < 0.001$ ).

**Discussion:** Adnexal torsion in postmenopausal women is an uncommon event. Malignancy risk should be considered before operation.

**Conclusion:** The malignancy rate was 16% in postmenopausal women with adnexal torsion. Thus, extensive surgeries are more common in postmenopausal women with adnexal torsion.

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## 1. Introduction

Adnexal torsion is defined as the twisting of the ovary and the fallopian tube around a center line consisting of the infundibulo-pelvic ligament and the utero-ovarian ligament. Adnexal torsion,

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which is one of the most common gynecologic emergencies, can occur in patients of any age, from in utero to postmenopausal women, but most commonly occurs in women in the reproductive age group [1].

The incidence of adnexal torsion is unknown. In a classic report of a 10-year review of patients at a women's hospital, ovarian torsion accounted for 2.7% of emergency surgeries [2]. The most common symptom of adnexal torsion is acute onset of lower abdominal pain, generally isolated to one side [3]. Nausea and vomiting also frequently accompany this pain [3]. Although symptoms are nonspecific, prompt diagnosis is important to preserve ovarian function and to prevent other associated morbidities.

An ultrasound is the preferred initial imaging study for patients with suspected ovarian torsion, but the more precise diagnosis of adnexal torsion is often done intraoperatively [4]. Torsion generally occurs in women with temporarily enlarged ovaries, often in association with an ovarian cyst or neoplasm, as directly related to the mass size. Follicular cysts, corpus lutei, benign cystic teratomas, and cystadenomas are mainly associated with torsion [2,5]. The incidence of torsion may be lower in postmenopausal women because of their decreased risk of having benign ovarian cysts and benign teratomas. Furthermore, malign ovarian lesions that make adhesions with neighboring tissues are less often the cause of torsion than benign ovarian cysts [5]. As torsion in postmenopausal women was reported in only few series, the differences between premenopausal and postmenopausal torsions concerning the risk of malignancy are not accurately known, nor are clinical findings or modes of therapy.

The objective of this retrospective multicentered study is to present a comprehensive comparison regarding the risk factors, clinical findings, and modes of therapy between surgically treated adnexal torsions in postmenopausal and premenopausal women. In addition, we define our experience in diagnosing and managing postmenopausal women with adnexal torsions.

## 2. Materials and methods

The databases of four gynecology and obstetrics departments from Turkey, including Tepecik Education and Research Hospital (Izmir), Bakirköy Dr. Sadi Konuk Teaching and Research Hospital (Istanbul), Yeni Yuzyil University School of Medicine, GOP Hospital (Istanbul), and Hacettepe University School of Medicine (Ankara), were reviewed retrospectively using patient charts. A total of 173 patients were found to have undergone operations for adnexal torsion. Pregnant and premenarchal patients were excluded from the study, and 157 patients were analyzed according to demographic characteristics, menopausal status, preoperative signs and symptoms, surgical findings and applied surgical procedures, and pathological results between January 2010 and January 2015. Torsion was defined as a rotation of the ovary/adnexa of at least 360°. Menopause was diagnosed when patients reported 12 months of amenorrhea with or without menopausal symptoms. The outcomes of malignant patients were also reviewed based on their follow-up charts. The study was conducted in accordance with the ethical standards of the Declaration of Helsinki and was approved by the local ethics committees of Tepecik Education and Research Hospital (Izmir).

### 2.1. Statistics

Data were analyzed using Statistical Package for the Social Sciences, version 18.0 (SPSS Inc., Chicago IL, USA). Variables were investigated using visual (e.g. histograms, probability plots) and analytical methods (e.g. Kolmogorov-Smirnov/Shapiro-Wilk test) to determine a normal distribution. Continuous data (presented as

the mean  $\pm$  SD) were analyzed using the Student's t-test. The chi-square and Fisher exact tests were used to compare the proportions of different groups. P-values of less than 0.05 were considered to indicate a significant difference.

## 3. Theory

If patients with suspected adnexal torsion are in the postmenopausal period, then preparation for more extensive surgery for malign diseases should be contemplated. Patients should be instructed and written informed consent for possible *oophorectomy* and/or *hysterectomy* and *debulking* should be obtained preoperatively.

## 4. Results

One hundred and fifty-seven patients who were treated surgically in four tertiary gynecologic centers in Turkey were analyzed in this study according to their menopausal status, presurgical evaluations, surgical methods, frozen section results, and pathological findings. Of those who met the inclusion criteria, 132 patients were premenopausal and 25 patients were postmenopausal.

Preoperative characteristics and intraoperative findings among pre and postmenopausal women with adnexal torsion are noted in Table 1. As expected, the postmenopausal group consisted of older women, with an average age of  $59.2 \pm 12.1$  years, as compared to the premenopausal group, which had an average age of  $29 \pm 8.6$  years ( $p < 0.001$ ). Clinical signs were similar in both groups, including abdominal pain, nausea and vomiting, pelvic sensitivity and fever. The only statistically significant signs were the presence of an abdominal mass (50% in the postmenopausal group vs. 3% in the premenopausal group;  $p < 0.001$ ) and peritoneal signs-rebound (16% vs. 36%, respectively;  $p < 0.05$ ).

Ultrasonographic findings, including ovarian diameter, the complexity of the ovarian mass, and the absence of Doppler flow, were also similar in both groups. In addition, the laboratory findings of white blood cells and CA125 levels were not significant in either group.

The main surgical indication for the postmenopausal women, as noted by the surgeon, was pelvic mass (58% vs. 40% in the premenopausal group;  $p < 0.001$ ), while the main indication for premenopausal women was the suspicion of torsion (55% vs. 24% in the postmenopausal group;  $p < 0.001$ ). When comparing surgical characteristics and operating times, the duration of time between being admitted to the hospital and entering the operating room as well as the duration of surgery and postoperative hospitalization were statistically longer in the postmenopausal group ( $p < 0.001$ ) (Table 1).

The surgical procedures that were performed on women with adnexal torsion are shown in Fig. 1. The surgical procedures performed were significantly different between the two groups. The trend toward laparotomy was significant in the postmenopausal group (84% vs. 51% in the premenopausal group). While extensive surgery—total abdominal hysterectomy and bilateral salpingo-oophorectomy (TAH + BSO)—was performed on 68% of the postmenopausal group, it was only performed on 3% of the premenopausal group.

In premenopausal women, 51% of the cases had a laparotomy, which mainly consisted of unilateral salpingo-oophorectomy (USO) in 74% of laparotomies in premenopausal women and detorsion + cystectomy (D + CYS) in 16% of cases. Rates of detorsion and D + CYS were significantly higher in cases of laparoscopy (16% and 50%, respectively).

Pathologic specimens were available for only 120 of the 132 premenopausal patients due to conservative detorsion surgery.

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