



Clinical characteristics and the risk for malignancy in postmenopausal women with adnexal torsion



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ABSTRACT

Objective: To compare clinical characteristics and management of adnexal torsion in postmenopausal patients as compared to premenopausal ones.

Methods: A retrospective 22 year cohort of all cases of surgically verified adnexal torsion in postmenopausal and premenopausal patients, comparing presentation, imaging, surgical procedure and histology.

Results: Thirty five cases of adnexal torsion among postmenopausal patients were compared to 302 cases among premenopausal ones. Complex ovarian masses and larger ovarian diameter were more common among postmenopausal patients (7.8 vs. 6.8 cm, $p=0.003$). The admission to surgical interval differed substantially between the groups (75.5 h in postmenopausal patients vs. 24.4 in the premenopausal ones, $p<0.001$). The main surgical indication for postmenopausal patients was pelvic mass investigation (54.3% vs 11.6%, $p<0.001$), and more premenopausal patients underwent surgery with a clinical suspicion of adnexal torsion (77.1% vs. 40%, $p<0.001$). Extensive surgery including bilateral salpingo-oophorectomy with or without total abdominal hysterectomy was more commonly performed in postmenopausal patients, as opposed to conservative surgery, including detorsion and cystectomy/fenestration or detorsion only, in premenopausal surgeries. Cancer was diagnosed in 3% of postmenopausal patients with adnexal torsion.

Conclusion: Adnexal torsion in postmenopausal women is rare, but presents similarly, results in more delayed and extensive surgery and involves malignancy in 3%.

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1. Introduction

Ovarian torsion refers to the torsion of the ovary, whether complete or partial, typically around both the infundibulopelvic and utero-ovarian ligaments. If the fallopian tube twists as well, as often occurs, it is referred to as adnexal torsion. Ovarian torsion is one of the most common gynecologic emergencies [1], as blood supply to the ovary is often compromised as result of the torsion, and prompt diagnosis and intervention is required to preserve ovarian function and prevent additional morbidity [2]. Isolated torsion of the

fallopian tube may also occur [3], as well as paraovarian [4] or paratubal [5] cyst torsion.

Ovarian torsion was found in 2.5–7.4% of patients undergoing surgery for acute pelvic pain [6,7], with an estimated annual prevalence of 2% to 6% [7]. Ovarian cysts or neoplasm predispose the adult woman to ovarian torsion as directly related to the mass size, unless the mass is relatively fixed (due to size or adhesions) or malignant. Bouguizane et al. investigated 709 patients operated for an adnexal mass and found adnexal torsion to be present in 14.8% [8]. However, ovarian torsion may often occur in patients with no such findings [9], as is more common in premenarchal girls, in whom an elongated utero-ovarian ligament is noted [10,11]. Although torsion may occur on either side, there seems to be a predisposition for right sided torsion [12,13], possibly explained by a longer right utero-ovarian ligament or proximity of the left ovary to the sigmoid colon.

Several risk factors for ovarian torsion have been previously recognized in literature, including a past history of adnexal torsion,

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polycystic ovarian syndrome, ovarian hyperstimulation syndrome, ovulation induction, tubal ligation and pregnancy [14]. Acute onset abdominal pain is the most common presenting symptom, with possible nausea, vomiting, and even peritonitis and fever as additional possible symptoms and signs [15]. The diagnosis of adnexal torsion is often challenging due to non-specific findings upon physical examination [15] and laboratory results [9,15,16]. Pelvic ultrasonography has also shown partial success in diagnosing ovarian torsion [16–18], with uncertain predictive value of Doppler flow [19], although postmenopausal women were found more likely to demonstrate absent flow [20]. Eventually, adnexal torsion is often confirmed intra-operatively [21,22], when conservative or definitive treatment may be offered [23,24], as determined by patient age, fertility plans, menopausal status and ovarian disease, also considering recurrence rates for each treatment option [9,25].

Previous reports of adnexal torsion have not focused on the postmenopausal woman and there are scant published data regarding the specific characteristics of adnexal torsion in this group of women [32,33]. The objective of our study was to present a current and comprehensive comparison of patient characteristics and management between adnexal torsion in postmenopausal and premenopausal patients.

2. Materials and methods

Our study is a retrospective cohort study of patients with proven adnexal torsion, treated in the Edith Wolfson Medical Center between the years 1990 to 2012. The study was approved by our institutional review board in agreement with the Helsinki declaration. Patient charts with an ICD9 coded diagnosis of adnexal torsion were retrieved and reviewed for data, including patient demographics, menopausal status, gynecological history, clinical and laboratory presentation and imaging at admission, surgical findings and procedure. Torsion was defined as a rotation of the ovary/adnexa of at least 360 degrees. Patients were included in the post-menopausal group if they reported 12 months of amenorrhea with or without menopausal symptoms. Premenopausal controls were excluded if pre-menarchal or pregnant.

Continuous variables were calculated as mean \pm SD or median and range as appropriate, and compared with the use of Student's *t*-test. Categorical variables were calculated as rate (%) and compared using the Chi-square test or Fisher's exact test as appropriate. A *p*-value of <0.05 was considered statistically significant.

3. Results

Three hundred and fifty three operations were performed for adnexal torsion during this 22 year period. 16 of these were performed in premenarcheal patients and therefore excluded. Of the remaining operations, 302 were performed in premenopausal patients and 35 in postmenopausal ones, all meeting the inclusion criteria.

Patient presentation, including clinical, imaging and laboratory findings are noted in Table 1. As anticipated, the postmenopausal group consisted of older women, with an average age of 63 as compared to 32 ($p < 0.001$).

The clinical presentation was similar for both groups, including similar rates of nausea and vomiting, fever, abdominal pain, peritoneal signs and pelvic sensitivity (Table 1). Right sided presentation was similarly noted in both groups (62.9% and 71.4%). A complex mass on US examination at admission was found in 45% of postmenopausal patients as compared to 27% of premenopausal ones ($p = 0.04$), with an average ovarian diameter of 7.8 and 6.8 cm, respectively ($p = 0.03$). Absent Doppler flow, when preformed, did not differ between the groups. In addition, no differences were

Table 1

Presenting symptoms and signs among pre and postmenopausal women with adnexal torsion.

Characteristic	Postmenopausal (n = 35)	Premenopausal (n = 302)	<i>p</i> Value
Demographics			
Age (years)*	63.4 \pm 12.5	32.1 \pm 14.9	<0.001
Signs and symptoms			
Fever > 38 °C (%)	1 (2.9%)	23 (7.7%)	0.49
Nausea and vomiting (%)	15 (42.9%)	141 (46.7%)	0.72
Abdominal pain (%)	29 (82.9%)	260 (87%)	0.44
Peritoneal signs-rebound (%)	5 (14.3%)	82 (27.4%)	0.1
Right side (%)	25 (71.4%)	190 (62.9%)	0.35
Pelvic sensitivity (%)	18 (54.5%)	152 (65.5%)	0.24
Duration of pain (h)	47.3 \pm 56.1	26.7 \pm 33.7	0.005
Ultrasound findings			
Ovarian diameter (cm)	7.8 \pm 3.1	6.8 \pm 2.6	0.038
Complex mass (%)	15 (45%)	76 (27%)	0.04
Absent flow on Doppler (%)	5/10 (50%)	41/94 (43%)	0.74
Laboratory findings			
WBC (cells/ μ L)	10.3 \pm 4.1	10.5 \pm 3.4	0.72
CA125 (U/mL)*	25.8 \pm 33.3 (n = 23)	25.5 \pm 29 (n = 58)	0.96

* Data presented as mean \pm standard deviation.

* Data available for all group patients, except for Doppler flow and CA 125 levels, in which number of patients included in analysis was noted.

observed in the leukocyte and CA125 levels between study groups (Table 1).

Patient history revealed a significantly elongated duration of pain prior to presentation in postmenopausal patients as compared to the premenopausal ones (47.3 vs. 26.7 h, $p = 0.005$) (Table 1). In addition, the admission to surgical interval noted in our study differed substantially between the groups, with an average interval of 75.5 h in the postmenopausal group, as compared to 24.4 in the premenopausal one [$p < 0.001$] (Table 2). The main surgical indication for postmenopausal patients, as noted by the performing surgeon, was more commonly pelvic mass investigation (54.3% vs. 11.6%, $p < 0.001$), and more premenopausal patients underwent surgery with a clinical suspicion of adnexal torsion (77.1% vs. 40%, $p < 0.001$).

Table 2 refers to surgical characteristics and intraoperative findings. A trend towards laparoscopy was noted among premenopausal patients (76.4% vs. 62.8%, $p = 0.09$). Extensive surgery including bilateral salpingo-oophorectomy with or without total abdominal hysterectomy was more commonly performed in postmenopausal patients, as opposed to conservative surgery, including detorsion and cystectomy/fenestration or detorsion only, which were more common in premenopausal surgeries, and were therefore noted to be shorter. Rates of intraoperative findings of total adnexal torsion and cyanotic adnexal appearance did not differ statistically. Postmenopausal patients also had a longer post-operative stay (7.5 days vs. 3.7, $p < 0.001$).

Finally, a histological finding of cyst adenoma was the most common histological finding among postmenopausal patients, as opposed to functional cysts, which were more commonly found among premenopausal patients (Table 3). Cancer was diagnosed in 3% of postmenopausal patients with adnexal torsion, a rate similar to that of premenopausal patients ($p = 0.59$).

4. Discussion

Adnexal torsion represents a diagnostic challenge which requires prompt intervention in premenopausal women, with the intent of ovarian tissue salvage and fertility preservation. It is

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