



Research Paper

A Case-series on Clinical and Surgical Findings of Ovarian Torsion



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Running Title Findings of Ovarian Torsion

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ABSTRACT

Background: Ovarian Torsion (OT) is a common gynecological emergency. Clinical presentation is nonspecific, and diagnosis is based on a high index of suspicion. Current recommendations strongly are based on ovarian support.

Objectives: To assess clinical findings and therapeutic approach of patients diagnosed with OT.

Materials & Methods: In this retrospective study 104 patients with confirmed OT in surgery were investigated. Clinical symptoms, laboratory indices, ultrasonography finding, and therapeutic approach were collected from hospital records of patients from 2001 to 2021.

Results: The Mean±SD age of patients was 34.7±14.1 years old. The Mean±SD duration from hospitalization to surgery was 6.4±3 hours. The most common symptom in patients was abdominal pain (100%) followed by nausea and vomiting (76.9%). Ovarian cyst (71.2%) was the most gynecologic etiology of OT. Local tenderness (92.3%) and rebound tenderness (46.2%) were the most prevalent sign in physical examination. Necrotic ovary was found in 60 patients (57.7%) at surgery. Detorsion was possible in only 26 patients (25%).

Conclusion: This study revealed that most objective findings in patients were nondifferential. The majority of patients with OT were in the reproductive ages, but just one fourth of them treated with conservative management.

Keywords: Ovary, Laparotomy, Ovarian torsion, Ovarian cysts

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1. Introduction

Ovarian Torsion (OT) has been known as the 5th most prevalent emergency in the field of gynecology and can result in infertility in case of delayed or inappropriate treatment [1]. OT presents with partial or complete rotation of ligament of ovaries that leads to decreased blood flow, hemorrhagic infarction and necrosis [2, 3]. This emergency condition require immediate surgery but the diagnosis might be complicated because of non-specific clinical presentation [4]. The accompanying symptoms might be varies depending on the type of OT and diagnosis should be made with a combination of patient' history, physical exam, and radiologic evidence [5]. Ultrasonography is a pre-clinical approach for diagnosis, yet the findings might be non-specific [6, 7].

This study aimed to evaluate the clinical, laboratory, and sonographic findings of women with surgically confirmed OT to better and faster diagnosis and better management.

2. Material and Methods

This descriptive study was retrospectively conducted on patients with OT who referred to Alzahra hospital for 20 years from 2001 to 2021. As many of cases of ovarian torsion have been confirmed with surgery, so we included only proven cases by surgery into the study. Data collection forms included; demographic information, ultrasonography results, clinical presentations, surgical methods and their consequences (protection of ovaries). Clinical presentations included; the time of onset of pain, coexisting situations, fever, lab tests (White Blood Cell counts [WBC], inflammatory markers), risk factors, duration of the onset of symptoms before admission, the period of time to get to the operating room, the history of the previous disorders which are related to the ovarian diseases, and differential diagnosis. Data were described using frequency and percent or Mean±SD. The association between variable were explored using chi-square test. Data analysis was performed with SPSS software v. 16.

3. Results

A total of 104 patients with surgically proven OT were included. The Mean±SD age of subjects was 34.8±14.1, (range 16-80) years old. Table 1 illustrates gynecologic comorbidities of the study population. Ovarian cyst (71.2%) followed by ovarian tumor (19.2%) were the most prevalent gynecologic condition among patients.

Four patients had the history of torsion with recurrence that led to ovarian necrosis and oophorectomy or salpingo-oophorectomy.

Clinical condition

Fifty-six patients (53.8%) admitted to the hospital in less than 24 hours from onset of symptoms and the rest of them admitted longer than 24 hours. The Mean±SD duration from admission to surgery was 6.4±3 hours. Except of one case that lasted for 72 hours, 84 cases (80.7%) operated within less than 10 hours. Pain was the major symptom in all patents that was presented as either sudden acute lower abdominal pain (55.8%) or consistent moderate pain (44.2%). The second prevalent symptom was nausea and vomiting (76.9%) that was followed by anorexia (21.2%). Six percent complained for dysuria and 5.8% reported menstrual disturbance. Physical examination findings revealed local tenderness in 96 (92.3%), rebound tenderness in 48 cases (46.2%), abdominal guarding in 14 patients (13.5%). During vaginal examination, vaginal mass was reported in 44 cases (42.3%). abdominal mass in 11.5%, and adnexal mass in 30.7%.

Laboratory findings

Leukocytosis was seen in 22 (21.1%), microscopic hematuria in 10 (9.6%), pyuria in 2 (1.9%), and anemia in 14 cases (13.4%).

Ultrasonography findings

Ultrasonography was performed in 93 cases. The most popular finding was ovarian cyst (57.7%) including solid cyst (7.7%), complex or semi-solid (5.8%), corpus luteoma cyst (5.8%), and adenoma cysts in 4 patients; 58 cases (55.8%) had right, 46 cases (44.2%) had left, and 4 cases (3.8%) had both sides with one side torsion. Free pelvic fluid was seen in 22 patients (21.2%). In 6 cases (5.8%) space occupying mass was presented and it was difficult to find the source of problem. Hypertrophic ovary was reported in 12 cases (11.5%). Four cases had large ovary with one grown up follicle, and 8 cases had multi grown up follicles. In one case ovarian hematoma was shown with fallopian necrosis. Because of anatomical change, 44 ovaries could not be seen. Ten ovary and fallopian loops (9.6%) were edematous (Table 2).

Surgical findings

Ovarian condition during the surgeries showed that 32 cases (30.8%) had normal ovaries, 60 subjects (57.7%) had necrotic ovaries, and 12 cases (11.5%) had necrotic

Table 1. The frequency of associated gynecologic conditions

Gynecologic Conditions	No.(%)
Tubal ligation	16(15.4)
Chronic pelvic pain	6(5.8)
Adenomyosis	2(1.9)
Ovarian cyst	74(71.2)
Ovarian tumor	20(19.2)
History of ovarian torsion	4(3.8)
History of ovarian cyst	16(15.4)



fallopian loop. Forty-eight patients (46.2%) had simple cyst, 6 subjects (5.8%) had corpus luteoma, and 4 (3.8%) had adenoma cyst. All patients underwent laparotomy; 44 (42.3%) had oophorectomy, and 34 patients (32.7%) had salpingoophorectomy. Twenty-six patients (25%) had a conservative remedy. Table 3 shows frequency of necrotic ovaries according to age and clinical findings. There were no significant association between being at reproductive age, previous history of ovarian cyst, and history of ovarian torsion with fallopian or ovarian necrosis ($P<0.05$).

4. Discussion

The main complication with OT is misdiagnosed because of non-specific clinical findings and many differential diagnoses. In this study, most patients were

at middle reproductive age that was similar to previous studies [8-13]. So, ovarian torsion must be suspected in all patients during fertility age with abdominal pain [12].

In current study, there was no patients in childhood and younger than 15 years old. This study was conducted in a referral center of gynecologic disease in adult women and child emergency condition referred to pediatric center. In the results of the study by Kurger and colleagues 5 out of 31 patients were children [14].

Delay to intervention may leads to irreversible ovarian necrosis. There is a potential relationship between the risk of torsion and waiting time for the surgery [15]. In our study the mean duration from onset of symptoms to admission was 8 days, and the mean duration from admission to surgery was 6.5 hours that was higher than

Table 2. Frequency of sonographic findings

Sonographic Findings	No.(%)
Normal ovary	18(17.3)
Necrotic ovary	42(40.4)
Cystic ovary	60(57.7)
Solid mass	8(7.7)
Complicated mass	6(5.7)
Enlarged ovary	12(11.5)
Edematous adnexa	10(9.6)
Free fluid	22(21.2)
Space occupying mass	6(5.8)



Table 3. Frequency of necrotic adnexal torsion according to study variables

Variables		No.(%)		
		Necrotic	Normal	Total
Age	Reproductive age	62(73.8)	22(26.2)	84(100)
	Non-reproductive age	10(50)	10(50)	20(100)
Pain	Acute	48(82.8)	10(17.2)	58(100)
	Intermittent	24(52.2)	22(47.8)	46(100)
Fever	Yes	18(81.8)	4(18.2)	22(100)
	No	54(65.9)	28(34.1)	82(100)
History of ovarian torsion	Yes	4(100)	-	4(100)
	No	68(68)	32(32)	100(100)
History of ovarian cyst	Yes	10(62.5)	6(37.5)	16(100)
	No	62(70.5)	26(29.5)	88(100)



previous study. White et al. showed the mean duration of the onset of symptoms to admission was 3 days [13]. The reason of longer duration in our study might be because of decreased symptoms or economic situation of patients.

In our study all patients referred with abdominal pain, among them, 29 cases had acute abdominal pain because of complete pedicular torsion and difficult circulation. Mazouni et al. reported abdominal pain in the majority of their patients (80.8%), and the frequency of vomiting and fever were (13.5%) and (9.6%), respectively [16]. There were no constipation and diarrhea in our study, but there was urinary irritation in 5.8% of cases.

Paying attention to the urinary signs are important for differential diagnosis between torsion and urinary infections. The latter requires examination for WBC or bacteria. Fever could be the sign of ovarian necrosis, but is not always accompany with necrosis. In our study there was no significant association between fever and ovarian necrosis. White et al. showed that 10 cases (19.6%) had fever [13]. There has been suspicion to ovarian torsion in patients with coexisting risk factors such as; previous abdominal surgery, ovarian cyst, ovarian hyper stimulation syndrome, and polycystic ovary [9]. White and colleagues concluded; 31% of cases had one risk factor that was less than the other reports [13]. Ovarian cyst has been considered as an important etiology for OT [17]. Similarly, in current study the majority of patients was diagnosed with ovarian cyst.

Laparoscopy with ovary preservation should be done in patients with torsion who wants to be fertile in the future [18, 19]. Laparoscopy is preferable to laparotomy for uncomplicated ovarian torsion, because of lower risk of thromboembolism, post-surgical pain, duration of hospitalization and lower costs [13]. In this study, laparoscopy was not performed in any of the patients. Despite of the superiority of conservative management for preserving fertility in women during reproductive age, only 25% of patients had conservative remedy in the form of detorsion.

5. Conclusion

This study revealed that most patients with OT were in the reproductive ages. The most important symptom of ovarian torsion was acute abdominal pain and the most important etiology was ovarian cyst. Ultrasonography had a limited role for pathologic determination or differential diagnosis. It was not used for diagnosis and making the decision to remove the ovary. Timely referral of patients with acute pelvic pain is of most importance for better prognosis.

Ethical Considerations

Compliance with ethical guidelines

The paper was extracted from the MD. Thesis of Hajar Keivan Khosro, Department of Obstetrics & Gynecology, School of Medicine, [Guilan University of Medical Sciences](#), Rasht, Iran (Registration Code: 1166).

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Authors' contributions

Conceptualization and supervision and Investigation: Mandana Mansour Ghanaie and Katayoun Haryalchi; Writing- original draft: Seyed Mohammad Asgari Ghalebin and Sepehr Olangian-Tehrani; Sedighe Bab Eghbal and Seyedeh Maryam Attari; Writing- review & editing; Data collection and resources: Hajar Keivan Khosro.

Conflict of interest

The authors declared no conflict of interest.

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