

Demographic, Clinical Symptoms, Imaging and Pathology Characteristics of Patients with Adnexal Torsion: A Ten-Year Study

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ABSTRACT

Background & Objective: Adnexal torsion is a complete or incomplete twisting of the ovary, fallopian tubes, or ovarian cyst around its vascular axis, which can cause blood flow disruption. This disorder is rare but serious and accounts for about 3% of women's emergency surgeries. Early diagnosis of this disease and the necessary surgeries are very important to preserve fertility. The purpose of this study is to investigate the epidemiology, clinical symptoms, imaging and pathology of patients with torsion of the adnexa referred to the emergency rooms of Mahdiyeh and Shohadaye Tajrish hospitals.

Materials & Methods: This study is a retrospective cross-sectional study. In the present study, 190 patients with torsion of the adnexa were examined in the period 2011–2021, in Mahdiyeh and Shohadaye Tajrish hospitals. Demographic, clinical and surgical information about patients was extracted from medical records. Data analysis was done using SPSS version 22 statistical software.

Results: The average age of 190 patients was 29.2. Most of the ovarian torsion patients had a history of more than one previous delivery (57.9%) and also, an ovarian mass was observed in 157 patients, and the ovarian mass of 146 patients was larger than 5 cm. The rate of ovarian preservation in this study was 61%. Hemorrhagic cysts were the most common type of cyst in patients and were reported in 37 patients.

Conclusion: It is necessary to identify effective diagnostic methods. Therefore, it may be useful to investigate more serum biomarkers for early detection of adnexal torsion and to reduce diagnostic errors.

Keywords: Ovarian preservation, Ovary, Adnexal mass, Torsion

Introduction

Adnexal torsion is a complete or incomplete twisting of the ovary, fallopian tubes, or ovarian cyst around their vascular axis, which can cause blood flow disruption (1-3). This disorder is rare but serious and accounts for about 3% of women's emergency surgeries. The reason why these patients go to the emergency room is often because of acute abdominal pain, which is the fifth most common gynecological emergency (3-5). This disorder often occurs during reproductive age, but it may be seen at any age (3, 6). The length of the uterine-ovarian ligament, even in a healthy ovary, can be the cause of this disorder. Also, enlargement and movement of the ovary due to ovarian masses and polycystic ovary syndrome (PCOS) are causes of torsion (7). The use of ovulation induction methods in infertile women increases the risk of torsion

because it causes the formation of large follicular cysts in the ovary (8).

The most common clinical symptom of these patients is acute pain in the lower abdomen, and usually other symptoms such as nausea, vomiting and fever are observed in these patients (9). The clinical characteristics of patients with torsion of the adnexa are non-specific, so the diagnosis of this disease is difficult and causes a delay in the diagnosis of patients, which can endanger women's fertility (10). The use of imaging can be useful in diagnosis, but currently the definitive diagnosis is made during surgery, and surgery is used to treat patients (11-15).

The purpose of this study is to investigate the epidemiology, clinical symptoms, imaging and pathology of patients with torsion of the adnexa

referred to the emergency rooms of Mahdiyeh and ShohadayeTajrish hospitals.

Methods

This study is a retrospective cross-sectional study. In the present study, 190 patients with torsion of the adnexa were examined in the period 2011–2021, in Mahdiyeh and Shohaday-e Tajrish hospitals. Patients often go to the emergency department of hospitals due to acute and intermittent abdominal pain, nausea and vomiting. Patients who were diagnosed with complete or incomplete adnexal torsion in laparotomy or laparoscopy, or in some cases, who underwent surgery with the initial diagnosis of suspected adnexal torsion and, during surgery, the diagnosis of adnexal torsion was rejected, were included in the study.

History, description of surgery and pathology such as age, the primary complaint of patients, ovarian mass pathology, surgical operations, the size of the ovarian mass, leukocytosis, fever, involved anatomical site, number of torsions, preservation of ovaries, parity, pregnancy, gestational age at diagnosis, the presence of an ovarian mass, history of tubal ligation, history of torsion, PCOS, ovarian hyperstimulation syndrome (OHSS), the time interval between the arrival of the patient to the hospital and the start of the surgery, and history of gynecological infections of patients were

extracted from hospital records and analyzed using SPSS version 22 statistical software(IBM, USA).

We conducted this study after obtaining ethical approval from the Ethical Committee of Shahid Beheshti University of Medical Sciences [IR.SBMU.MSP.REC.1400.285].

Results

During the last 10 years, a total of 195 patients with complaints such as acute or intermittent abdominal pain, vomiting, and nausea were referred to Mahdiyeh and Shohaday-e Tajrish hospitals, and ovarian torsion was diagnosed. The documents of five patients were not available in the hospitals, or they had not undergone surgery, so the information of 190 patients was extracted. The age range of the patients was 16 to 54 years, and most of the ovarian torsion patients were at the age of 31. Also, the average age of the patients was 29.2 ± 8.92 . Also, 30 patients were pregnant, and among them, 12 were experiencing their first pregnancy. None of the patients had a history of previous torsion and tubal ligation. Eight patients were suffering from PCOS, and only one patient had torsion due to OHSS and a recent cycle. But the most important risk factor for ovarian torsion was the presence of an ovarian mass, and its prevalence in patients was 82% ([Table 1](#)).

Table 1. Demographic information of patients.

Median age (range age)	29.2±8.92 (16-54)
Parity	N (percentage)
Nulliparous	80 (42.1%)
Primiparous	28 (14.73%)
Multiparous	92 (48.42%)
Pregnancy during torsion	30 (15.7%)
Risk Factors	N (percentage)
Ovarian Mass	157 (82.6%)
Tubal Ligation	0 (0%)
Previous Torsion	0 (0%)
PCOS	8 (4.21%)
OHSS	1 (0.52%)

Among the 190 patients who underwent surgery, 18 underwent laparoscopy and other patients underwent laparotomies. 42% of patients had left ovarian torsion and 58% had right ovarian torsion, and the average number of torsion rounds in patients was 2.9 ± 1.1 . In 93% of patients, an ovarian mass greater than 5 cm was reported in ultrasonography and surgery. In 116 patients, various surgeries were performed for the preservation of the ovaries. According to the age and

nature of the mass, 14 patients were candidates for hysterectomy; ovarian torsion was reported as an incidental finding; and 60 patients underwent salpingo-oophorectomy. Necrotic ovarian tissue was reported in the surgeries of these patients. Regarding ovarian preservation surgeries, 31 patients underwent detorsion surgery, and 84 patients underwent cystectomy and detorsion surgery. Also, cyst aspiration was performed in one patient instead of cystectomy ([Table 2](#)).

Table 2. Findings of surgery in patients.

Laparoscopy	18 (9.47%)
Laparotomy	172 (90.53%)
The mass size is more than 5 cm	146 (76.84%)
Torsion laterality	N (percentage)
Left	80 (42.1%)
Right	110 (57.9%)
Type of surgery	N (percentage)
Preservation of ovaries	116 (61.05%)
Detortion	31 (16.31%)
Detortion + cystectomy	84 (44.21%)
Detortion + Aspiration of the cyst	1 (0.52%)
oophorectomy	74 (38.94%)

Based on the available findings, the most common ovarian cysts in patients were hemorrhagic luteal cysts

(19.47%). The prevalence of other types of cysts is shown in [Table 3](#).

Table 3. Types of cysts in patients

Cyst type	Number
Simple cyst	3
Mucinous cystadenoma	8
Dermoid cyst	20
Cyst adenofibroma	2
Corpus luteal cyst	33
serous cystadenoma	21
Endometriotic cyst	14
Adenofibroma cyst	2
Hemorrhagic cyst	37
Follicular cyst	9
Seromucinous cyst	2
Carcinoma of ovary	2
Paratubal cyst	4

Discussion

Out of 190 surgeries, 116 patients underwent surgery with ovarian preservation, and 74 patients underwent salpingo-oophorectomy surgery. The findings of this study show that the presence of ovarian masses, especially masses larger than 5 cm, is one of the most important risk factors for ovarian torsion. In line with the results of the present study, the findings of previous studies also showed that more than 80% of patients with ovarian torsion had ovarian masses larger than 5 cm (15-17).

In the present study, the most common reason for patients to go to the emergency room was acute and intermittent abdominal pain, and nausea was also observed in 67% of these patients. According to the data of this study, acute abdominal pain along with nausea and the presence of ovarian masses detected using ultrasonography increase the possibility of torsion. The results of other studies confirm the findings of the present study. In other studies, the most common clinical symptoms of acute abdominal pain, nausea and vomiting have been reported (15, 17-21).

In our study, Doppler flow was observed in 41% of patients. According to Nizar et al. study, Doppler flow has high sensitivity and specificity (22), but in another retrospective study, low sensitivity and high specificity were reported in the diagnosis of ovarian torsion (23). Therefore, Doppler flow cannot be the gold standard for diagnosing ovarian torsion, but it is a useful tool to help diagnose this disease (9).

According to the studies, the most common ultrasonography findings in cases of ovarian torsion are the presence of a mass (24, 25). In addition, enlargement and edematous ovaries, the whirlpool sign, the follicular ring sign, free fluid in the pelvis, small and peripheral follicles with central edema, and decreased, or absent venous flow have been observed in ultrasonography findings (24, 26, 27). The results of the study by Yatsenko et al. in the field of predicting ovarian torsion using ultrasound show that the "whirlpool" sign along with the "follicular ring" sign have 100% specificity (28).

In the study by Gupta et al. 81 patients with torsion were examined in a hospital in southern India from 2014 to 2019 (29). In this study, the ovarian preservation rate was 43.2% and the most common pathology in torsion patients was a simple ovarian cyst. Whereas, in the present study, the rate of ovarian preservation was 61% and the most common pathology was hemorrhagic cyst. In Gupta's study, in line with our study, an ovarian mass larger than 5 cm was observed in most patients (81.48%) (29).

Based on the findings of another study conducted in Australia, the main clinical symptoms of ovarian torsion patients included sudden abdominal pain, nausea, vomiting, and a palpable abdominal mass. Ovarian cysts were the most common pathology associated with patients, and the rate of ovarian preservation was reported as 30.76% (17). The results of the study by Houry et al. confirm the results of other studies. According to the results of this study, the most common clinical symptoms were sudden onsets of

pain, nausea and vomiting. Also, ovarian masses above 5 cm were reported in 89% of patients (15).

Compared to laparotomy, laparoscopy is preferred due to fewer complications, reduced postoperative pain, and a shorter hospital stay (30, 31). In our study, only 9.5% of patients underwent laparoscopic surgery due to the lack and unavailability of experienced and capable surgeons. Previous studies recommended that ovarian cystectomy should be performed at an interval of 2-3 weeks after the detorsion operation in order to reduce edema, tissue bleeding and the risk of complications such as thrombosis and embolism (29). But in our study, none of the patients had severe complications after cystectomy.

Conclusion

Ovarian mass early diagnosis and appropriate treatment in adnexal torsion patients are important to preserve fertility. Therefore, it is necessary to identify effective diagnostic methods. Therefore, it may be useful to investigate more serum biomarkers for early detection of adnexal torsion and to reduce diagnostic errors. Ovarian mass, especially ovarian mass larger than 5 cm, can be one of the most important risk factors for adnexal torsion disease. Despite the fact that saving the ovary in this disease is challenging, the rate of saving the ovary in this study was reported to be 61%.

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Conflict of Interest

There is no conflict of interest in this study.

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