

RESEARCH ARTICLE

High Rate of Gangrenous Adnexal Torsion: Dilemma of a Missing Silent Cancer

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Abstract

Background: Adnexal torsion results in ischemia of structures distal to twisted pedicle and acute onset of pain is responsible for about 3% of all gynecologic emergencies. Ovarian torsion classically occurs in a pathological enlarged ovary, as with cancer, but diagnosis remains a challenge. **Objective:** Our purpose was to evaluate clinical risk factors predictive of torsion with gangrenous adnexa. **Material and methods:** A retrospective descriptive study and chart review of surgically proven ovarian torsion/adnexal torsion cases at the Obstetrics and Gynecology Department of Prapokklao Hospital, Chanthaburi, Thailand between January 2011 and December 2015 was conducted. **Result:** Seventy-eight cases were identified. Mean age at presentation was 35.5 years. The average maximum diameter of the ovarian tumors was 10.8 cm. The percentage of gangrenous ovarian cysts in this study was 46.2 (36/78). The precision to determine the pathological site by patient, physician and ultrasonography was 8.5, 24.2 and 83.3 percent, respectively with statistically significant variation. **Conclusion:** Ovarian/adnexal torsion remains a challenge condition especially in young nulliparous women. Sophisticated investigation does not guarantee ovary preservation. Combining clinical acumen, appropriate tests and detailed consideration may be the best practice at the present time.

Keywords: Adnexal torsion- ovarian torsion- gangrenous ovary- prediction of torsion

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Introduction

Adnexal torsion (twisting) of the vascular pedicle of an ovary, ovarian cyst, fallopian tube and paratubal cyst can result in ischemia of the structures distal to the twisted pedicle. Acute onset of pain is responsible for about three percent of all gynecologic emergencies (Berek JS, 2012; Sasaki et al., 2013; Lobo et al., 2016).

The cause of adnexal torsion is not well described. No one knows exactly what are the factors contributing to the twisting. Ovarian torsion classically occurs in the pathological enlarged ovary (Lourenco et al., 2014; Damigos et al., 2012; Erdemoğlu et al, 2011). It is believed that increased ovarian size is more likely to swing around its pedicle.

Diagnosis of adnexal torsion is challenge. Detailed patient history and physical examination are account for adnexal torsion diagnosis (Huchon et al., 2012). Ultrasound is the imaging modality of choice when adnexal torsion is suspected (Mashiach et al., 2011).

The aim of this study was to evaluate the clinical risk factor as predictive criteria for adnexal torsion with gangrene.

Materials and Method

Study population

A retrospective charts review of all cases with surgically proven adnexal torsion over a period from January 2011 to December 2015, at Department of Obstetrics and Gynecology, Prapokklao Hospital, Chanthaburi, Thailand.

Cases were included in this study only if there was an evidence of torsion at the time of definitive surgical treatment and confirm by pathological diagnosis. The study was approved by Ethic committee of Prapokklao Hospital Institute Review Board.

Data collection

Clinical information and background data obtained from patients' medical records were collected. Data collected include age, physical status (weight, height, body mass index), medical and personal history, reproductive history (menstrual status, current pregnancy, gravidity), history of gynecologic disease, previous surgery include tubal ligation and other pelvic surgery, signs and symptoms at presentation (clinical, onset of symptoms, abdominal and pelvic examination), ultrasonography

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findings, laboratory results, the approach of the surgical intervention (laparoscopy or laparotomy, extirpation of the mass, cystectomy and oophorectomy), intraoperative findings (directed visualization of the rotated adnexa, side of torsion), and postoperative pathological results (underlying pathology, mean size and largest diameter, findings suggestive of gangrenous change or hemorrhagic infarction). Statistical analysis was performed using SPSS 18.0 (SPSS, Inc., Chicago, USA)

Results

This was a retrospective investigation. Seventy-eight

women with surgically proven ovarian torsion were recruited during 5 years of this study. Average age, BMI, parity, history of surgery and underlying diseases were present in Table 1.

Gangrenous ovarian tumor was found at 46.2 percent (36/78). Premenarche, premenopause and menopause cases were 5, 82.1 and 13 percent, respectively. Three cases of this study were pregnant. Two thirds of all cases had no history of surgery. Site and pain characters present in table 1. Nausea and vomiting were reported at 50 and 46.2 percent. Three quarters (60/78) of cases had palpable lower abdominal mass.

Ultrasound findings showed multi-septate, solid

Table 1. Demographic Data

Characteristics	Gangrenous appearance		Total (n=78)
	Yes (n=36)	No (n=42)	
Age (years)*	36.8±16.7	34.4±14.9	35.5±15.7
BMI (kg/m ²)*	25.3±8.4	23.8±5.5	24.5±7.1
Underlying disease**	5.0 (13.9)	1.0 (2.4)	6.0 (7.7)
Nulliparous**	14.0 (38.9)	13.0 (31.0)	27.0 (34.6)
No history of surgery**	28.0 (77.8)	25.0 (59.5)	53.0 (67.9)
Chief complaint**			
RLQ pain	13.0 (36.1)	22.0 (52.4)	35.0 (44.9)
LLQ pain	14.0 (38.9)	10.0 (23.8)	24.0 (30.8)
Other	9.0 (26.0)	7.0 (16.7)	14.0 (17.9)
Onset of pain**			
Sudden	31.0 (86.1)	33.0 (78.6)	64.0 (82)
Progressive	5.0 (13.9)	9.0 (21.4)	14.0 (18)
Radiation of pain**	10.0 (27.8)	9.0 (21.4)	19.0 (24.4)
Associated activity**	1.0 (2.8)	3.0 (7.1)	4.0 (5.1)
Abdominal peritonitis**	16.0 (44.4)	17.0 (40.5)	33.0 (42.3)

RLQ, Right lower quadrant; LLQ, Left lower quadrant; *Mean ± standard deviation; **number (%)

Table 2. Ultrasound Findings and Pathological Reports

Ultrasongraphy findings	Gangrenous appearance		Total (n=78)
	Yes (n=36)	No (n=42)	
Characteristic of mass*			
Multi-septate	11.0 (30.6)	12.0 (28.6)	23.0 (29.5)
Solid-cystic mass	22.0 (61.1)	20.0 (47.6)	42.0 (53.8)
Simple cyst	3.0 (8.3)	10.0 (23.8)	13.0 (16.6)
Density of mass*			
Hypoechoic mass	18.0 (50.0)	20.0 (47.6)	38.0 (48.7)
Mixed echogenicity	18.0 (50.0)	22.0 (52.4)	40.0 (51.3)
Presentations of free fluids	14.0 (38.9)	9.0 (21.4)	23.0 (29.5)
Ovarian mass size (cm)**	11.9±4.5	9.9±4.4	10.8±4.5
Length of fallopian tube (cm)**	4.5±2.3	4.8±1.6	4.7±1.9
Pathological type*			
Serous cystadenoma	14.0 (38.9)	15.0 (35.7)	29.0 (37.2)
Mucinous cystadenoma	4.0 (11.1)	7.0 (16.7)	11.0 (14.1)
Mature cystic teratoma	11.0 (30.6)	14.0 (33.3)	25.0 (32.0)
Functional cyst	7.0 (19.4)	6.0 (14.3)	13.0 (16.7)

*, Mean ± standard deviation; **, number (%)

Table 3. Accuracy of Ovarian Site from Patient, Physician and Ultrasonography Information

	Patient			Physician			Ultrasonography		
	R	L	p-value	R	L	p-value	R	L	p-value
Right*	2.0	22.0	< 0.001	7.0	16.0	< 0.001	23.0	3.0	< 0.001
Left*	32.0	3.0		34.0	9.0		7.0	27.0	
Sensitivity	5.9	12.0		17.1	36.0		76.7	90.0	
Positive predictive value	8.3			30.4			88.5		
Negative predictive value	8.6			20.9			79.5		
Accuracy	8.5			24.2			83.3		

*Operative finding; R, right; L, left

cystic and single cyst at 29.5(23/78), 53.8(42/78) and 16.6(13/78) percent, respectively. The average maximum diameter of ovarian tumor was 10.8 cm (range 3 to 30 cm.) Average time from diagnosis to surgery in child/elderly and sexually active women were 13.5 and 10.4 hours with no statistical different. One thirds of cases were mature cystic teratoma as shown in Table 2. Most of the cases (77/78) underwent salpingo-oophorectomy. There was no ovarian malignancy reported in this study.

The acumen of ovarian site determination by patient complaint, pelvic examination and ultrasonography were compared in Table 3. The precision of pathological ovarian site determination was 8.5, 24.2 and 83.3 percent by patient, physician and ultrasonography respectively with statistically significant.

Discussion

Torsion of ovarian cyst resulted in ischemia of ovary and fallopian tube and acute onset of pain. Mature cystic teratoma (MCT) is the most common benign tumor to undergo torsion (Tobiume et al., 2011; Berek JS, 2012). The prevalence of MCT in this study is 32 percent compared to 12 percent reported from previous literature. (Karadag et al., 2014; Simsek et al., 2014). The cause of difference may be the difference of emergency condition and age group of the present study

Prevalence of benign serous and mucinous ovarian cyst were 36.0 and 30.4 percent (Karadag et al., 2014; Simsek et al., 2014). Both works based on data from elective surgery of pelvic mass contrast to this work that based on data from emergency condition. In this study, the prevalence of benign serous and mucinous ovarian tumor were 34.2 percent was 4.1 percent, respectively.

Even though there was no case of cancer in this study. However the difficulty for histopathological study occurred in gangrenous ovarian specimen. Closed follow up is recommend for gangrenous cases. Previous literature showed incidence of silent cancer around 4.0% (Abduljabbar et al., 2015; Erdemoglu et al., 2014). If gangrenous adnexal torsion occurred, undiagnosed ovarian cancer would be found at half rate of cases. Late diagnosis and delayed of ovarian cancer contribute to poor survival outcome. Careful follow up such as clinical examination or tumor marker may be benefit.

The sequelae of ovarian cyst torsion yielded devastated ovarian tissue. Gangrenous appearance was a condition that more difficult to do conservative surgery

(ovarian cystectomy) (Lobo et al., 2016). Percentage of gangrenous ovarian cyst in this study was 46.2(36/78). One thirds of cases was nulliparous. It means that half of cases will loss her ovary. The chief complaint of 75 percent of patients who came to our hospital was sudden onset of pain. Nearly half of cases had peritonism in gangrenous and non-gangrenous group.

Ultrasound finding of multi-septate, solid cystic, single cavitory of cyst, echogenicity and ovarian pathology could not predict the gangrenous condition. Average diameter of ovarian cyst with torsion in current study was 10.8 cm. There was no specific size criteria for ovarian cyst with complication, but 83% of torsion cases occurred in ovaries that were 5 cm or larger. The important sign of twisted ovarian cyst was the presence of the pelvic mass on bimanual examination and pain (Berek JS, 2012; Mahim et al., 2012; Sahlu et al., 2014).

From history taking, sudden onset of pain from right or left lower abdomen could not be a predictive measure of accurate site of pathological ovary. Accuracy of precised ovarian tumor site prediction from history taking was only 8.5 percent. The accuracy of ovarian tumor site prediction from pelvic examination by physician was better than that of the history taking (24.2 % versus 8.5%). Ultrasonography showed the most accuracy of site prediction at 83.3 percent. This finding implied that pain and palpated mass from either right or left could not predict the accuracy pathological ovarian tumor site. The ultrasonography showed intracavitory structure, echogenicity and accuracy of pathological site.

Time from diagnosis of twisted ovarian tumor to operation should be as rapid as possible. Delayed in diagnosis and operative intervention caused permanent loss of ovary in young active fertile nulliparous women in nearly half of cases.

Time to diagnosis of gangrenous and non-gangrenous cases in this study were 9.5 and 15.8 hours (p-value = 0.4). It seemed that even though the surgeon performed operation in gangrenous cases more rapidly than those non-gangrenous without statistical difference. The gangrenous group may represent subjects with more pain than the other group. This retrospective study had no data of pain score with this condition. The sooner we could correctly diagnose twisted adnexa, the more patients with ovarian tumor could be saved to remove them.

Mean weight of patients with gangrenous and non-gangrenous cases were 63.3 and 57.4 kg, respectively with no statistically different. It seemed that the gangrenous

part was more obese than the other part. The high patient weight may cause the delayed surgical decision, but there was no sufficient statistical support.

There was no accurate tool for rapid diagnosis of the twisted ovarian tumor. Good history taking, careful physical examination, pelvic examination, imaging and consideration of possible twisted ovarian tumor will help the physician resolve twisted ovarian tumor.

Torsion of the ovary remained a challenge condition especially in young nulliparous women. Delayed in diagnosis contribute to ovarian scarification. There was no definite clinical and investigation for accuracy and rapidly diagnosis of this condition. Sophisticated investigation had no guarantee of ovarian preservation. Surgical intervention remained the therapeutic and diagnosis of twisted ovarian tumor. The earlier diagnosis was confirmed, the more twisted ovarian tumor should be preserved.

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Disclosure of interests

The authors have no relevant conflict of interests to disclose.

Reference

- Abduljabbar HS, Bukhari YA, Al Hachim EG, et al (2016). Review of 244 cases of ovarian cysts. *Saudi Med J*, **36**, 834-8.
- Berek JS (2012). Pelvic Pain and Dysmenorrhea. In: 'Berek and Novak's gynecology', Eds Lippincott Williams & Wilkins, Philadelphia, pp 475.
- Damigos E, Johns J, Ross J (2012). An update on the diagnosis and management of ovarian torsion. *Obstet Gynecol*, **14**, 229-36.
- Erdemoğlu M, Kuyumcuoglu U, Guzel AI (2011). Clinical experience of adnexal torsion: evaluation of 143 cases. *J Exp Ther Oncol*, **9**, 171-4.
- Huchon C, Panel P, Kayem G, et al (2012). Does this woman have adnexal torsion? *Hum Reprod*, **27**, 2359-64.
- Karadag B, Kocak M, Kayikcioglu F, et al (2014). Risk for malignant and borderline ovarian neoplasms following basic preoperative evaluation by ultrasonography, ca125 level and age. *Asian Pac J Cancer Prev*, **15**, 8489-93.
- Lobo RA, Gershenson DM, Lentz GM, et al (2016). *Comprehensive gynecology*, Philadelphia, Elsevier, pp 418-21.
- Lourenco AP, Swenson D, Tubbs RJ, et al (2014). Ovarian and tubal torsion: imaging findings on US, CT, and MRI. *Emerg Radiol*, **21**, 179-87.
- Mahim N, Maria C, Mandana M (2012). Clinical and pathological findings of ovarian cyst, Torsion over the ovary period of ten years (2001-2011). *JPSI*, **6**, 79-81.
- Mashiach R, Melamed N, Gilad N, et al (2011). Sonographic diagnosis of ovarian torsion: accuracy and predictive factors. *Ultrasound Med*, **30**, 1205-10.
- Oranratanaphan S, Khemapech N (2013). Characteristics and treatment outcomes of patients with malignant transformation arising from mature cystic teratoma of the ovary: experience at a single institution. *Asian Pac J Cancer*

Prev, **14**, 4693-7.

- Sahlu Z, Negash S, Yusuf L (2014). Adnexal torsion a five-year retrospective review in two hospitals. *Ethiop Med J*, **52**, 155-64.
- Sasaki KJ, Miller CE (2013). Adnexal Torsion: Review of the Literature. *J minim invasive gynecol*, **21**, 196-202.
- Simsek HS, Tokmak A, Ozgu E, et al (2014). Role of a risk of malignancy index in clinical approaches to adnexal masses. *Asian Pac J Cancer Prev*, **15**, 7793-7.
- Tobiume T, Shiota M, Umemoto M, et al (2011). Predictive factors for ovarian necrosis in torsion of ovarian tumor. *Tohoku J Exp Med*, **225**, 211-4.