

Management and outcomes of adnexal torsion: a 5-year experience

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Received: 23 March 2010 / Accepted: 22 September 2010 / Published online: 6 October 2010
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Abstract

Purpose To discuss the surgical results of patients with diagnosis of adnexal torsion.

Methods One hundred and fifty patients with diagnosis of adnexal torsion who presented to our clinic between January 2005 and December 2009 were included in this retrospective analysis. Data regarding age, gravidity, parity, size of mass, operation time, and duration of hospitalization were recorded and compared between the patients who had laparoscopy to those who had laparotomy. The pathological results of patients were also recorded.

Results Fifty-eight patients were treated laparoscopically while 92 patients had laparotomy. The most frequent presenting symptom was pelvic pain (96%). Laparoscopy group consisted of young patients with low parity; operation and hospital stay time was shorter in laparoscopy group. Velocity loss in Doppler ultrasonography was noted in 81.3% of the patients. Of the laparotomy group 35 postmenopausal patients had hysterectomy and bilateral salpingo-oophorectomy, and staging surgery was done for 16 of them. The pathological finding was found to be malignant in four and borderline serous tumor in four patients.

Conclusion Laparoscopy is preferred for young patients who want to preserve their fertility. Because of high risk of malignancy in postmenopausal ovarian masses presenting with torsion; frozen section should be used. If not possible or not conclusive, staging surgery is more appropriate especially if there is suspicion of malignancy.

Keywords Adnexal torsion · Detorsion · Laparoscopy · Laparotomy

Introduction

Adnexal torsion constitutes 2.7% of gynecological emergencies, it is more frequently seen in reproductive age [1]. Although the exact etiology of adnexal torsion is not known; ovarian tumors are present in most of the cases. Torsion of normal sized ovary is very rare. Big ovaries like polycystic ovaries and benign cystic teratomas are more vulnerable for torsion [2]. Delay in diagnosis and treatment may lead to loss of the ovary [3]. Conservative surgery is preferred in young patients who want to preserve their fertility [4]. In these patients when adnexal torsion is suspected surgical intervention should not be delayed with laparoscopy as first choice of treatment [5]. Incidence of torsion may be lower in postmenopausal women because of decreased risk of benign ovarian cysts and benign teratomas. But adnexal masses in menopausal patients are more likely to be malignant [6, 7].

In this study we aimed to assess patients that had adnexal torsion and compare laparoscopy to laparotomy in the treatment of these patients and point the most appropriate surgery according to age groups of the patients.

Materials and methods

This study was carried out in Selcuk University, Meram Faculty of Medicine, Department of Gynecology and Obstetrics. Our hospital is a tertiary care medical center and cases are referred to us from other hospitals. The study retrospectively analyzed 150 patients presented to our

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clinic with abdominal pain from January 2005 through December 2009 and had surgery for adnexal torsion. Data regarding age, gravidity, parity, size of adnexal mass, preoperative and postoperative hemoglobin (Hb) values, operation time, postoperative fever, white blood cell (WBC) count and duration of hospitalization were recorded and compared between the patients that had laparoscopy to those who had laparotomy. Details of the surgical operation [adnexal detorsion, cystectomy, oophorectomy, total abdominal hysterectomy and bilateral salpingo-oophorectomy (TAH–BSO) and staging surgery] and the histopathological results were also recorded.

Statistical analyses were performed using SPSS software, version 16.0 (SPSS, Chicago, IL, USA). Values are given as mean \pm SD. The *t* test for independent samples and the χ^2 test were used. $P < 0.05$ was considered significant.

Results

The study included 150 patients who had surgery for ovarian torsion. Of these 58 patients were treated laparoscopically while 92 patients had laparotomy. The most common symptom was pelvic pain (96%) and the most common sign was pelvic mass (97.3%). Doppler ultrasonography was done for all patients; velocity loss was seen in (81.3%), and 12 (8%) patients were pregnant (Table 1).

The average age, gravidity, parity, body mass index (BMI), the size of adnexal masses, preoperative and postoperative Hb values, WBC count, postoperative fever and the duration of the operation and hospitalization of the patients that had laparotomy or laparoscopy for adnexal torsion are shown in Table 2.

Laparoscopy group consisted of young patients with low parity while laparotomy group consisted of 92 patients of which 35 (38%) were in menopause. Operation time and hospitalization time were shorter in laparoscopy group and the statistical difference was significant. A total of 21 patients were treated by detorsion. Of these, 14 had small

cortical peripheral ovarian cysts in the ultrasonographic examination. Ten of these patients were in laparoscopy group and four in the laparotomy group. The details of the surgical interventions are shown in Table 3. Torsions were mostly seen on right side (59.3%).

For postmenopausal patients TAH–BSO was performed. Unfortunately, in our centre there is no possibility of frozen pathological section study outside the working hours. Frozen section was taken in two of the postmenopausal patients because the operation was performed during the working hours and the result was benign. The rest were operated on after working hours because they presented with acute pain to the emergency department, so additional staging surgery was performed in 16 of these patients because of suspicion of malignancy from the macroscopic appearance of the mass. Staging included pelvic wash for cytology, hysterectomy and adnexectomy, omentectomy and lymph-node sampling. The pathological results of these patients were malignant in four and borderline in four patients. So the pathological result was consistent with malignancy in 50% of patients for whom staging surgery was performed. The pathological results of the patients are shown in Table 4.

Discussion

Ovarian torsion is the rotation of the ovary or the adnex around its axis and the vascular pedicle. As a result of this arterial, venous or lymphatic blockage may occur and lead to massive congestion, infarction and finally hemorrhagic necrosis in the ovarian parenchyma [8, 9]. Some studies report that there is increased risk of adnexal torsion in pregnancy [10, 11]. Twelve of our cases were pregnant, eight in the laparoscopy group and four in the laparotomy group.

The value of preoperative colored Doppler ultrasonography in the diagnosis is debatable. Lee et al. [8] in their study found that color Doppler ultrasonography can confirm the preoperative diagnosis in 87% of cases. In our study preoperative Doppler ultrasonography was done for all the patients. Velocity loss of blood flow was noticed in 81.3% patients. This was of clinical importance in the diagnosis.

Laparoscopy when compared to laparotomy in the surgical treatment of torsions is associated with less postoperative pain, more patient satisfaction and less hospitalization period [12]. Lo et al. studied 179 patients who were operated on for adnexal torsion. Laparoscopy was applied to 103 and laparotomy to 76. Lesser postoperative complication and shorter hospital stay were documented in the laparoscopy group (2.9 ± 1.1 vs. 6.0 ± 3.7 days). They did not find statistically significant difference in the

Table 1 Preoperative symptoms and signs

	Number (<i>n</i> = 150)	(%)
Ovarian or adnexal mass	146	97.3
Pelvic pain	144	96.0
Peritoneal sign	126	84.0
Velocity loss in Doppler USG	122	81.3
Nausea and vomiting	82	54.6
Fever	12	8.0
Torsion with pregnancy	12	8.0

USG ultrasonography

Table 2 The characteristics of patients that had laparoscopy or laparotomy for ovarian torsion

	Laparoscopy (<i>n</i> = 58)	Laparotomy (<i>n</i> = 92)	<i>P</i> value
Age (years)	23.5 ± 5.4	37.4 ± 16.9	<0.001 ^a
Gravidity	0.6 ± 0.9	2.8 ± 2.7	<0.001 ^a
Parity	0.5 ± 0.8	2.4 ± 2.5	<0.001 ^a
BMI (kg/m ²)	23.3 ± 1.9	25.9 ± 2.9	<0.001 ^a
Mass size (cm)	7.2 ± 2.1	11.9 ± 6.9	0.001 ^a
Pre-operative Hb values (g/dl)	11.4 ± 1.3	11.8 ± 1.6	0.33 ^a
Postoperative Hb values (g/dl)	10.5 ± 1.2	10.2 ± 1.4	0.23 ^a
White blood cell count (WBC)	8885 ± 2316	11334 ± 3552	0.002 ^a
Operative time (min)	35.8 ± 8.1	72.2 ± 32.8	<0.001 ^a
Hospital stay (days)	1.8 ± 0.6	4.0 ± 1.5	<0.001 ^a
Presence of necrosis	33 (56.9%)	76 (82.6%)	<0.001 ^b
Postoperative fever	2 (3.4%)	13 (14.1%)	0.03 ^b

Values are mean ± SD or number (percentage)

BMI body mass index, Hb hemoglobin

^a Student's *t* test

^b χ^2 test

Table 3 The details of the surgical interventions

	Laparoscopy (<i>n</i> = 58)	Laparotomy (<i>n</i> = 92)	<i>P</i> value
Detortion	14 (24.1%)	7 (7.6%)	<0.001
Detortion + cystectomy	34 (58.6%)	35 (38.0%)	0.01
Salpingo-oophorectomy	10 (17.2%)	15 (16.3%)	0.88
TAH-BSO	0	19 (20.6%)	<0.001
TAH-BSO and staging surgery	0	16 (17.4%)	<0.001

TAH-BSO Total abdominal hysterectomy + bilateral salpingo-oophorectomy

Table 4 Pathological findings of ovarian torsion

	Pathological finding	(%)
Teratoma	48	32.0
Follicular cyst	22	14.6
Corpus luteum cyst	16	10.6
Serous cystadenoma	16	10.6
Mucinous cystadenoma	12	8.0
Endometrioma	10	6.6
Fibroma	5	3.3
Borderline serous tumor	4	2.6
Ovarian malignancy ^a	4	2.6
Unclassified	13	8.6

^a Granulosa cell tumor and three serous cystadenocarcinoma

operation time (105.6 ± 42.7 vs. 101.5 ± 39.4 min) [13]. In another study by Oelsner et al. [14] on 102 patients with ovarian torsion they found that patients who had laparoscopic surgery compared to those with laparotomy, had lesser postoperative complications and shorter hospital stay. In our study we compared laparoscopy to laparotomy in the treatment of these patients and we found similar results to these studies, we noticed lesser postoperative

complications and shorter hospital stay in the laparoscopy group (1.8 ± 0.6 vs. 4.0 ± 1.5 day). The duration of the operation was shorter in the laparoscopy group (35.8 ± 8.1 vs. 72.2 ± 32.8 min). Torsions were mostly seen on right side (59.3%) and this may be due to the limited mobility of the adnexa on left side because of the mesosigmoid.

Although ovarian torsion may occur without any ovarian pathology, it is usually associated with benign ovarian cysts. The most frequent associating condition is mature cystic teratoma. Malignant ovarian cysts are seen in about 2% of cases [15]. In a study by Lee et al. [16] they reviewed 135 cases of adnexal torsion and they did report a 15% incidence of malignancy in the entire group, and a 25% incidence in women older than 60 years. Eitan et al. [17] studied the risk of malignancy in 27 postmenopausal patients with adnexal torsion and diagnosed malignancy in 6 patients (22%); frozen section pathology was utilized in four of the six patients during surgery, but it was diagnostic for invasive carcinoma in only one. They stated that frozen section analysis of the adnexal masses may be unreliable and surgeons should rely more on clinical evaluation so when malignancy is suspected, staging should be performed. In our study the most frequent associating condition was mature cystic teratoma, the incidence of malignancy was 5.3% and all were in menopause. Malignancy was suspected in these patients from the macroscopic appearance of the mass and for that reason staging surgery was performed.

In conclusion, laparoscopic surgery is preferred for young patients who want to preserve their fertility, but postmenopausal ovarian masses presenting with torsion should be analyzed with frozen section whenever possible. If it is not possible or conclusive, staging surgery is more appropriate especially if there is suspicion of malignancy, because the high risk of malignancy is of major importance and should be taken into account.

Acknowledgments We thank all the study participants and research staff of the Department of Obstetrics and Gynecology, Faculty of Medicine, Selcuk University. No funding for the study was received.

Conflict of interest None.

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