ORIGINAL ARTICLE

A Retrospective Analysis of Ovarian Torsion in Adolescence

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ABSTRACT

Aim: To compare the management of adnexal torsion in pre- and post- menarcheal adolescent girls in a tertiary care hospital with managements suggested in the literature.
Methods: A retrospective 10 year chart [cases] review was carried out from January 2002to December 2011, at King Khalid University Hospital (KKUH)
Results: A total of71patients wereadmitted with post-operative diagnosis of ovarian cyst. Of them, 10 patients (mean age 14.1; range 8-19 years) underwent oophorectomy for adnexal torsion. The commonest clinical presentation was lower abdominal pain [n=9] and 7 were clinical diagnosedas acute appendicitis. Mean time for diagnosis was 2.6 days whereas; the mean time between diagnosis to surgery was 22.9 hours. Two patients had normal appearing adnexa while two had benign neoplasm.
Conclusion: All reported cases in this report were managed with removal of the adnexa and more than half via laparotomy whereas literature supports conservative laparoscopic management of adnexal torsion with a view of conserving the ovary.
Keywords: adnexal torsion, premenarcheal, postmenarcheal, ovarian cyst, oophorectomy, abdominal pain, appearing adnexa, benign neoplasm, laparotomy

INTRODUCTION

Ovarian torsion is an uncommon cause of acute abdominal pain which is estimated to account for 3% of all cases of acute abdominal pain in adult women[1]. Although it is considered uncommon, yet it is one of the most common surgical emergencies in all age groups in gynecology. Consequences include complete torsion causes venous and lymphatic blockage leading to stasis, congestion, hemorrhage and necrosis. The etiology of ovarian torsion is obscure but moderate size ovarian cyst or tumor, long pedicle of the adnexa are considered as the predisposing factors[2]. Although it is infrequently encountered in young girls, ovarian and paratubal cysts are more likely to tort in pre-menarcheal and teenage girls than in adults. The diagnosis of adnexal torsion is challenging because of inconsistent history, symptoms and physical findings[3]. Techniques of visualizing adenexial torsion include Ultrasound scan and sonographic whirlpool sign. Traditionally, the standard treatment of choice for torted ischemic haemorrhagic adnexa was by adnexectomy rather than de-torting (untwisting) the affected side. Many Reports in the literature have shown that simple unwinding of ischemic and apparently non-viable ovary by laparotomy or laparoscopy can completely restore the blood supply to the ovary, thus preventing oophorectomy[4,5]. Other modalitiesovarian bivalving technique was found to be effective in decreasing intracapsular pressure, increasing arterial perfusion, and facilitating adnexal reperfusion and recovery[6]. Since Mage et.al[7] reported that de-torsion and preservation of the adnexa is an alternative mode of treatment. De-torsion has become the preferred approach by laparoscopy with its added benefits and superiority over laparotomy.

The purpose of this study was to report our experience and increase the awareness and improve the diagnostic tools and surgical approach by laparoscopic de-torsion and preserve ovarian function in young women.

MATERIAL AND METHOD

A retrospective review of all patients with a discharge diagnosis of adnexal torsion or ovarian cyst, admitted to King Khalid University Hospital (KKUH) Riyadh, Saudi Arabia, between January 2002 and December 2011 was carried out. Seventy one (71) cases of ovarian cyst were identified from computer data and registry log books in the gynecologic, surgical, and pediatric wards. A total 10 cases of post-operative diagnosis of adnexal torsion were identified.

The selected charts were reviewed with attention to the age; between pre-pubescent and young adolescent. Detailed information including menstrual and surgical history, symptoms and sings at presentation, pre-operative diagnosis, time to diagnosis, ultrasound findings, size and side of the torted ovary and contra lateral ovary ,operative

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findings, histopathological diagnosis, treatment, post-operative complications and time to discharge from hospital and follow up were studied.

RESULTS

Ten cases of post-operative diagnosis of adnexal torsion were identified. Clinical features are shown in Table 1. The mean age was 14.1±3.3 years (8-19 years), 2 were pre-menarcheal, 2 had prolonged history of amenorrhea while 6 had regular menstrual cycles.

The most common presenting complaint was acute lower abdominal pain-unilateral or bilateral associated with nausea and vomiting. Only one patient had palpable pelvic mass and 3 patients had rebound tenderness and abdominal guarding whereas, 4 s had a temperature of >38^{0}C.

Laboratory findings were variable and non-specific. Leucoytosis was seen in 3 patients and a slight fall in haemoglobin concentration in 2, one of whom received blood transfusion intra-operatively. Ovarian vessel Doppler ultrasound was performed in 3 of the girls, but was in-conclusive.

Preoperatively 7 patients were diagnosed as adnexal torsion, 1 as acute appendicitis, 1 as intestinal obstruction while another one was thought to have gastritis. Acute appendicitis was the second most common diagnosis. The mean interval between the onset of symptoms and diagnosis was 2.6±1.3 days (range 1-5 days). The mean time from diagnosis to surgical treatment was 22.9±13.6 hours (range 6-48 hours).

Laparotomy was undertaken through a small Pfannenstiel incision (n=6) and other had laparoscopic surgery. At surgery, torsion was seen both the fallopian tube and the ovary but no case of bilateral torsion was reported. The right adnexae were involved in 7 cases while, remaining were on the left side. Hemo-peritoneum was not found in any of the patients, although the ovaries appeared to be hemorrhagic, infarcted and enlarged.

The ovaries were torted 2 or 3 times around their pedicles and were enlarged but looked healthy. In 3 cases before unilateral salpingo-oophorectomy, the torted ovaries were unwound for few minutes to see any reperfusion, and as the tissue failed to re-perfuse, unilateral salpingo-oophorectomy was done. The post-operative course of all the patients was uneventful, and they were discharged home in 3 to 5 days.

Table 2 shows the histopathological findings and all patients had of benign ovarian cysts. Three patients with fever had elevated white blood cell count and evidence of ovarian tissue necrosis.

DISCUSSION

Ovarian torsion occur secondary to the abnormal twisting of the involved ovary on its ligamentous support. Torsion of the ovarian blood supply will result in venous congestion, hemorrhage, and eventually ischemia. Prolonged ischemia of the ovary or other adnexal structures can lead to necrosis, resulting in loss of ovarian function or infection and peritonitis. In this study, none of the patients had any specific symptoms or objective findings to clue / suspect the diagnosis of adnexal torsion. Some patients were admitted to the general surgical ward with differential diagnosis including, acute appendicitis, gastroenteritis, pyelonephritis, Mittelschmerz (Mid-cycle pain), diverticulitis and, un-ruptured adnexal cyst. With regard to potential or ongoing ovarian torsion, early diagnosis must be the goal to preserve ovarian function and to decrease morbidity in these young patients[8]. The clinical suspicion of an adnexal torsion should be investigated by ultrasound scan as this not only aids in the detection of a pelvic mass but also helps in the evaluation of ovarian blood flow by color Doppler[9].

In this study, most of the cases of adnexal torsion were predominantly on the right side, as mentioned in the literature and this may be attributed to the presence of the sigmoid colon on the left side, or the hyper-mobility of the caecum on the right[10]. Concerns of possible thromboembolism and irreversible ischemic injury may have led to advocating removal of the adnexa, without unwinding of the torsion, ignoring the desire for future fertility but no reported cases of thromboembolic consequences related to adnexal torsion had been reported in the literature[11].

Untwisting tortuous adnexa was described by Way in 1946[12] and follow-up of these cases were reassuring. Interestingly ovaries which macroscopically appeared ischemic and even necrotic were capable of recovering and functional[13,14]. This was confirmed, by the detection of follicular growth by USS during the next cycles and the normal response to subsequent ovarian stimulation. This suggests that ovaries have the potential to revitalize and ovulate, despite the compromised blood supply. Apparently, oocytes have not been damaged by torsion and the ovary resumes normal function[15].

CONCLUSION

Adnexal torsion is a diagnostic challenge especially in young patients. The importance of laparoscopy to reduce diagnostic error and avoiding laparotomy cannot be disputed. In the management of ovarian torsion, de-torsion of the ovary should be encouraged.

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Table 1: Clinical presentation and findings in patients with ovarian torsion

Age	Symptoms	Signs	Time to Diagnosis (days)	Time to Operation (hrs)	USS Size- cm	Side	Ancillary measures	Hb g/dl	WBC x10^6
9	Abdominal pain off & on Nausea & Vomiting	Pulse 95bpm Temp 37 ĊLower abdominal tenderness, no bowel sounds	4	24	No pelvic USS	Left	Plain X-ray Barium enema	12.1	6.7
16	Abdominal pain N &V	pulse100bp Temp 38.5 Ċ No tenderness	3	8	ovarian mass 10.2x8,4x5.6cm	Left	Blood Trans-fusion.	6.2	18.2
13	Generalize abdominal pain, N &V, fever	Temperature 38.2 Ċ Generalized abdominal tenderness +++	1	6	Adnexal mass 7.3x6.0cm	Right	IV Antibiotics	9.9	17.0
14	Lower Abdominal pain Vomiting on & off Fever	Pulse 95bpm Temp.38.5Ċ Lower abdominal tenderness +++	3	48	No conclusive result from abdominal USS	Right	Prophy-lactic antibiotics	11.6	13.6
15	Nausea &V omitting and lower abdominal pain	Pulse90pm Temp37C Lower abdominal tenderness +++	2	36	4.0x 7.2 x 3.5cm ovarian cyst	Right		10.6	7.3
19	Lower abdominal pain	Temp. 37.3 Ċ Mild tenderness	3	17	5.0 x 4.6x 4.5cm	Right	Pregnancy test negative	11.3	8.5
8	Lower abdominal pain	Temp 37.1 Ċ Generalized abdominal tenderness +++ Rebound++	5	25	No USS	Right		9.7	7.7
16	Lower abdominal pain, N& V and fever	Pulse 100bpm, Temp. 38.9Ċ. Generalized tenderness+++	2	33	CT Scan Inflamed appendix	Right	Antibiotics	10.8	14.8
16	Vomiting lower abdo pain	Pulse96pm Temp36.4C Tenderness++	1	24	Ovarian mass 7.0x5.0 cm	Right		9.9	7.2
15	Vomiting and lower abdominal pain	Pulse90pm Temp37C Tenderness++	2	8	3.0 x4.0 x 5.0cm Mixed echogenic mass	Left		10.7	6.9

Lower Abdominal Tenderness -+ Mild, ++ Moderate, +++ Severe; Temp-Temperature; USS- Ultrasound

Table 2: Intra-operative findings and histological diagnosis in patients with ovarian torsion

Admission	Pre-Operative Diagnosis	Intra-operative Diagnosis	Surgical Procedure	Histological Diagnosis	Follow-up
Pediatric Surgery Ward	Intestinal Obstruction	-Ovarian cyst 5cm -Twisted 3 times	Laparoscopic Left SO	unidentified ovarian cyst infracted but with ovarian tissue - not malignant	Uneventful
Gynecology Ward	Degenerative Fibroid Adnexal Torsion	- Ovarian cyst 14x10x4.0 cm -One time twist -Dark hemorrhagic areas	Laparotomy, left SO	Hemorrhagic, Ischemic ovarian tissue with area of necrosis	Married with two children
General surgery ward	Acute appendicitis	Tubo-ovarian mass 6.8x6.5cmTwisted twice	Laparotomy Right SO	Tubo-ovarian abscess	Uneventful
General Surgery Ward	Acute Appendicitis	Ovarian cyst Twisted 3 times Untwisted for 3 minutes, no change in color	Laparoscopy Right SO *And*appendectomy	HemorrhagicCorpus luteum, 8x8 cm cyst Ovarian tissue seen Appendix not inflamed	Married with one miscarriage
Gynecology ward	Twisted ovarian cyst	-Ovarian cyst 6x7cm -Twisted three times	Laparotomy RightSO	Partially inflamed para ovarian cyst .Healthy ovarian tissue	Lost to follow-up
Gynecology ward	Adnexal torsion	-6.7x3.3x5.4 -Twisted twice	Laparoscopy Right SO	Follicularcyst and tubo ovarian tissue	Has two children
Pediatric Surgical ward	Gastroenteritis	Ovarian mass 4.7x5.4x3.2cm -Twisted	Laparoscopy followed by Laparotomy rright SO	Tubo ovarian tissue with some area of infarction	Regular menstrual cycles
General Surgery ward	Acute appendicitis	-Tubo-ovarian mass 7.5x6.0x5.3cm - Twisted once	Laparotomy Right SO	Tubo ovarian tissue w areas of necrosis and infarction	Primary infertility. Irregular cycles has PCOS
Gynecology ward	Ruptured Endometriotic ovarian cyst	left ovarian cyst 6x4.4cm	Laparotomy Left SO	Endometrioma and ovarian tissues with some area of necrosis	Has two children and one miscarriage
Gynecology ward	Ruptured ovarian cyst	-5.4x3.5x5.6x4.6cm twisted twice around the pedicle	Laparotomy LeftSO	Follicular cyst w areas of infarction	Regular cycles

SO -Salpingo-oophorectomy, PCOS -Polycystic ovarian syndrome