

Original Article

RETROSPECTIVE ANALYSIS OF OVARIAN TORSION IN ADOLESCENCE, A UNIVERSITY HOSPITAL EXPERIENCE

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Objective: To highlight and suggest a strategy in the management of adnexal torsion in pre- and post-menarcheal adolescent girls.

Material and Methods: A retrospective 10 year chart review was carried out between the period January 2002 and December 2011 at a tertiary care centre at King Khalid University Teaching Hospital (KKUH), Riyadh.

Results: A total of 71 girls were admitted with post operative diagnosis of ovarian cyst. Of them, 10 girls had adnexal torsion and underwent oophorectomy; the mean age of the 10 girls was 14.1 (range 8-19) years. The commonest clinical symptom was lower abdominal pain in 9 out of 10 girls. An error diagnosis occurred in 7 girls, with diagnosis of acute appendicitis being made in some of them. Clinical presentations in general were not specific. Mean time 8) hours. Two girls had normal appearing adnexa while two had benign neoplasm.

Conclusions: The evidence from the literature supports conservative laparoscopic management of adnexal torsion with a view of conserving the ovary. Unfortunately, all cases in our study were managed with removal of the adnexa and more than half via laparotomy.

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 constitutes 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, and moderate size ovarian cyst or tumor, long pedicle of the adnexa are the predisposing factors.² Although it is infrequently encountered in young girls, ovarian and paratubal cysts are more likely to tort in premenarcheal and teenage girls than in adults. The diagnosis of adnexal torsion is challenging, because the history, the symptoms and physical findings can be inconsistent.³ Techniques of visualizing adnexal torsion include Ultrasound scan and sonographic whirlpool sign. Traditionally, the standard treatment of choice for torqued 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 modalities ovarian bivalving technique was found to be effective in decreasing intracapsular pressure, increasing arterial perfusion, and facilitating adnexal reperfusion and recovery.⁶ Mage et al.⁷ have proved that de-torsion and preservation of the adnexa is an alternative mode of treatment. Since then de-torsion has become the preferred approach by laparoscopy with its added benefits and superiority over laparotomy.

The purpose of this study is to report our experience on the management of ovarian torsion in children and adolescents, to increase the awareness and improve the diagnostic tools and surgical approach by laparoscopic distortion and preserve ovarian function in young women.

Material and Methods

A retrospective chart 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 by computer and hand searches of the registry log books in the gynecologic, surgical, and pediatric wards. Of these, ten (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. Specific detailed information includes menstrual status, surgical history, symptoms and signs at presentation, pre-operative diagnosis, time to diagnosis, ultrasound findings, size and side of the torsed ovary and contra lateral ovary. Operative findings were reviewed; pathologic diagnosis, treatment post operative complications and time to discharge from hospital were noted.

Results

Table-1 shows the clinical features of the 10 patients. In the study period, of the 10 patients who were between 8 and 19 years of age (mean age 14.1 ± 3.3 years), 2 were pre-menarcheal; 2 patients had prolonged periods of amenorrhea, and 6 were having regular menstrual cycles. An equal number presented in the follicular phase and luteal phases of the cycle.

The most common presenting complaint was acute lower abdominal pain-unilateral or bilateral. Nausea and vomiting were common to all, while one was dehydrated. Palpable pelvic mass was found in one of them who was extremely thin, but in general, physical signs and symptoms were non-specific. Four patients had a temperature of $>38.00\text{C}$. Three patients had rebound tenderness and abdominal guarding.

Laboratory findings were variable and non-specific. Leucocytosis was seen in 3 patients and a slight fall

in haemoglobin concentration in two, one of whom received blood transfusion intra-operatively. Ovarian vessel Doppler ultrasound was performed in three of the girls, but was in-conclusive (unpublished data).

Only 7 out of 10 patients had adnexal torsion. Other 3 had suspected acute appendicitis. One had surgical emergency (intestinal obstruction) while another one was thought to have gastritis. Acute appendicitis was the second most common diagnosis. The mean time lag between the onset of symptoms and diagnosis was 2.6 ± 1.3 days (range 1-5 days). The mean time from diagnosis to surgery was 22.9 ± 13.6 hours (range 6 - 48 hours).

Laparotomy was undertaken through a small Pfannestiel incision; in 6 of the patients, and 4 had laparoscopic surgery. At surgery, torsion involved both the fallopian tube and the ovary in all cases. The right adnexae were involved in 7 cases, while the left adnexae were involved in 3 cases. There were no cases of bilateral torsion. Hemo-peritoneum was not found in any of the patients, although the ovaries appeared to be hemorrhagic, infarcted and enlarged.

The ovaries were torsed 2 or 3 times around their pedicles. In all, the other ovary was enlarged but looked healthy. In 3 cases the torsed ovary was intentionally unwound for few minutes, and as the tissue failed to re-perfuse, unilateral salpingo-oophorectomy was undertaken. The Post-operative course of all the patients was uneventful, and they were discharged home in 3 to 5 days.

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

Age	Symptoms	Sign	Time to diagnosis (days) 4	Time to diagnosis (days) 24	USS Size cm	Side	Ancillary Measure	Hbg/d	WBC x106
9	Abdominal pain on & Off Nausea & Vomiting	Pulse 95bpm Temp 37 °C Lower 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	Pulse 100bp Temp 37.5 °C No tenderness	3	8	ovarian mass 10.2x8.4x5.6cm	Left	Blood Transfusion	6.2	14.2
13	Generalize abdominal pain, N & V, fever	Temperature 38.2 °C Generalized abdominal tenderness +++	1	06	adnexal mass 7.3x6.0 cm	Right	IV Antibiotics	9.9	17.0
14	Lower Abdominal pain Vomiting on & off Fever	Pulse 95bpm Temp. 38.5 °C Lower abdominal tenderness +++	3	48	No conclusive result from abdominal USS	Right	Prophylactic antibiotics	11.6	13.6
15	Nausea & V omitting and lower abdominal pain	Pulse 90bpm Temp 37 °C 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 °C 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 °C Generalized abdominal tenderness +++ Rebound++	5	25	No USS	Right		9.3	7.7
16	Lower abdominal pain, N & V and fever	Lower abdominal pain, N & V and fever	2	33	CT Scan Inflamed appendix	Right	Antibiotics	10.86	14.8
16	Vomiting lower abdo pain	Pulse 96bpm Temp 36.4 °C Tenderness++	1	24	Ovarian mass 7.0x5.0 cm	Right		9.9	72
15	Vomiting and lower abdominal pain	Pulse 90bpm Temp 37 °C Tenderness++	3	8	3.0 x 4.0 x 5.0cm Mixed echogenic mass	Left		6.9	10.7

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-op Diagnosis	Intra-operative Diagnosis	Surgical procedure	Histological Diagnosis	Follow-up
Paediatric Surgery Ward	Intestinal obstruction	- Ovarian cyst 5cm - Twisted 4 times	Laparotomy, left SO	unidentified ovarian cyst infarcted but with ovarian tissue - not malignant	Uneventful
Abdominal pain N & V	Degenerative Fibroid Adnexal Torsion	- Ovarian cyst 14x10x4.0 cm - One time twist - Dark haemorrhagic areas	Laparotomy, left SO	Haemorrhagic, Ischemic ovarian tissue with Area of necrosis	Married with two children
General surgery ward	Acute appendicitis	Tubo-ovarian mass 6.8x6.5cm Twisted twice	Pregnancy test negative	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	Haemorrhagic Corpus 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 Right SO	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	Follicular cyst and tubo ovarian tissue	Has two children
Paediatric Surgical ward	Gastroenteritis++	Ovarian mass 4.7x5.4x3.2cm Twisted	Laparoscopy followed by Laparotomy Right SO	Tubo ovarian tissue with some area of infarction	Regular menstrual cycles
General Surgery ward	Acute appendicitis	-Tubo-ovarian mass 7 . 5 x 6 . 0 x 5 . 3 c m - 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	Torsion of the left ovarian pedicle with ovarian cyst 6x4.4cm	Laparotomy Left SO	Endometrioma and ovarian tissues with some area of necrosis	Has three children & one miscarriage
Gynecology ward	Ruptured ovarian cyst	-5.4x3.5x5.6x4.6cm twisted twice around the pedicle	Laparotomy Left SO	Follicular cyst w areas of infarction	Regular cycles

SO - Salpingo-oophorectomy , PCOS - Polycystic ovarian syndrome

Table-2 shows the pathological and histological diagnoses in patients with ovarian torsion. All the patients had reports of benign ovarian cysts with no sign of malignancy. Three of them who had fever and elevated white blood cell count showed evidence of ovarian tissue necrosis.

Discussion

In our study, it was not possible to determine any specific symptoms or objective findings to heighten the suspicion of adnexal torsion. Some patients were admitted to the general surgical ward because of close resemblance and mimicking general surgical diseases. Hence 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 our study, most of the cases of adnexal torsion were predominantly on the right side, as mentioned in the literature and this could be due to the location of the sigmoid colon occupying the pelvic space on

the left, 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. An extensive literature review found no reported cases of thromboembolic consequences related to adnexal torsion.¹¹

Untwisting tortuous adnexa is not a new idea, as it was described by Way in 1946¹² and follow-up of these cases were reassuring. There are reports in the literature, which showed that ovaries which macroscopically appeared ischemic and even necrotic were capable of recovering and functional.^{13, 14} Following treatment, the detection of follicular growth as demonstrated by USS during the next cycles and the normal response to subsequent ovarian stimulation, suggest that the ovaries have maintained 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 as it is difficult to diagnose in a timely fashion in young patients. The significant value of laparoscopy to Reduce diagnostic error and in avoiding laparotomy cannot be disputed. In the management of ovarian

torsion, detortion of the ovary should be encouraged.

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References

1. Rody A , Jackisch C, Klockenbusch W, Heinig J, Coenen-Worch V, Schneider HP. the conservative management of adnexial torsion-a case report and review of literature. *Eur J Obstet Gynecol Reprod Biol.* 2002 Feb; 101(1):83-86.
2. Hibbard LT. Adnexal torsion. *Am J Obstet Gynecol.* 1985 Jun;152(4):456-61.
3. Rousseau V, Massicot R, Darwish AA, Sauvat F, Emond S, Thibaud E, Nihoul-Fékété C. Emergency management and conservative surgery of ovarian torsion in children: a report of 40 cases. *Journal of pediatric and adolescent gynecology* 2008, 21(4):201-206.
4. Chaperon C. Capella. Alloue, S ,D ubuisson J B. Treatment of adnexal torsion using operative Laparoscopy. *Hum Reproductive* 1996 ;11 ;993-1003.
5. Crouch NS, Gyampoh B, Cuner AS, Creighton SM. Ovarian torsion: To pex or not to pex? Case report and review of the literature. *Journal of pediatric and adolescent gynecology* 2003, 16: 381-384.
6. Styer AK, Laufer MR.. Ovarian bivalving after detorsion. *Fertil Steril.* 2002 May;77(5):1053-5
7. Mage G, Canis M, Manhes H, Pouly JL, Bruhat MA. Laparoscopic management of adnexal torsion, a review of 35 cases. *J Reprod Med.* 1989 Aug;34(8):520-4.
8. Brech LL , Hillard PJ Adnexal torsion in pediatric and adolescent girls. *Curr Opin Obstet Gynecol.* 2005 Oct;17(5):483-9
9. Peña JE, Ufberg D, Cooney N, Denis AL. Usefulness of Doppler sonography in the diagnosis of ovarian torsion. *Fertil Steril.* 2000 May;73(5):1047-50.
10. Piper HG , Oltmann SC, Xu L, Adusumilli S, Fischer AC. Ovarian torsion; diagnosis of inclusion mandates earlier intervention. *J Pediatric Surg.* 2012 Nov;47(11):2071-6. doi: 10.1016/j.jpedsurg.2012.06.011.
11. Aziz D , Davis V, Allen L, Langer JC Ovarian torsion in children: Is oophorectomy necessary? *J Pediatr Surg.* 2004 May;39(5):750-3.
12. Way S. Ovarian cystectomy of twisted cysts. *Lancet.* 1946 Jul 13;2(6411):47
13. Cil AP , Akgul MA, Tulunay G, Atayar YY.. Recovery of ovarian function after detorsion: Doppler findings. *Acta Radiol.* 2006 Jul;47(6):618-20
14. Oltmann SC1, Fischer A, Barber R, Huang R, Hicks B, Garcia N.. Cannot exclude torsion-a 15-year review. *J Pediatr Surg.* 2009 Jun;44(6):1212-6
15. Galinier P, Carfagna L, Delsol M, Ballouhey Q, Lemasson F, LeMandat A, Moscovici J, Guitard J, Pienkowski C, Vaysse P. Ovarian torsion. Management and ovarian prognosis: a report of 45 cases. *J Pediatr Surg.* 2009 Sep;44(9):1759-65.