Original Article

Access this article online
Website: www.afrjpaedsurg.org
DOI: 10.4103/0189-6725.143134
Quick Response Code:

A retrospective review of the adnexal outcome after detorsion in premenarchal girls

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ABSTRACT

Background: The aim of this study was to report our results on premenarchal girls with adnexal torsion who were treated with different approaches. **Materials and Methods:** Twenty-six adnexal torsions in children were analysed retrospectively. Group 1 included cases of oophorectomy for the twisted adnexa. Group 2 contained the patients with adnexal torsion who untwisted either with a laparoscopic or open approach. Postoperative restoration of ovarian function was evaluated by Doppler ultrasound at the 6th month. All oophorectomy and biopsy specimens were also evaluated. **Results:** Group 1 consisted of eleven cases that underwent oophorectomy due to gangrenous change and haemorrhagic infarction. Histology was of a mature teratoma in two cases and haemorrhagic necrosis due to torsion in seven. Group 2 consisted of 15 patients. In 10 out of 15 patients, preoperative biopsy is performed in which their histology revealed haemorrhagic necrosis in eight cases, and simple cyst with a benign nature in two cases. In all of the 10 untwisted adnexas, postoperative radiological imaging showed complete recovery with normal follicular development. No malignancy or increased tumour markers were noted in both groups. **Conclusion:** Adnexas can be left in place regardless of the preoperative degree of necrosis. Biopsy can be added to the procedure to rule out malignancy.

Key words: Detorsion, over torsion, premenarchal girls

INTRODUCTION

Adnexal torsion is defined as the rotation of the ovarian vascular pedicle in various degrees, causing vascular obstruction. It is one of the rare causes of acute abdomen in girls; up to 2.7% of paediatric cases are estimated dealing with acute abdominal pain.[1,2] According to one study, 15% of all adnexal torsions occur in childhood.[3] Adnexal torsion cannot be easily diagnosed due to clinical symptoms related to acute appendicitis, and 2% of all cases reportedly underwent surgery after having being misdiagnosed as appendicitis.[4]

Consensus has not been reached on the appropriate treatment of twisted adnexa with a haemorrhagic appearance in premenarchal girls. Salvaging the adnexa can maximise future reproductive potential.[5]

The aim of this study was to retrospectively review the clinical records of premenarchal girls with adnexal torsion who were treated with different approaches. We also evaluated the postoperative restoration of ovarian function, and we comment on the most appropriate treatment.

MATERIALS AND METHODS

Between June 1997 and May 2010, the medical records of all female paediatric patients who received a diagnosis of adnexal torsion in our institution were collected and analysed retrospectively. No exclusion criteria were used. Children who underwent an operation due to twisted adnexa were divided into two groups based on treatment modalities. Group 1 included patients who had undergone open oophorectomy for twisted adnexa. Group 2 included patients with adnexal torsion detorsioned either with laparoscopic or open access. The therapeutic modality selected depended completely on the surgeon's decision during surgery. Levels of tumour markers were also evaluated in both groups.

All cases in Group 2 were recalled to our outpatient clinic to re-evaluate the viability of the ovary. The adnexal size and the presence or absence of adnexal vascularity were evaluated by Doppler ultrasound. All the oophorectomy specimens from Group 1 and

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the biopsy specimens collected from the untwisted adnexa in Group 2 were evaluated histopathologically. The data from the groups were compared in terms of demographics, duration of onset of symptoms, torsion site and histopathological examination. All laparoscopic approaches were accomplished by using three ports. No complication was encountered during the operations.

Descriptive statistical methods were used for the analysis. Kolmogorov-Smirov Shapiro-Wilk normality tests were used for the normality analysis. ANOVA and *t*-test methods were used to compare the groups. The Kruskal-Wallis test was used for the variance analysis, and the Mann-Whitney U-test was used to compare the groups for which the normal distribution did not exist. $P < 0.05$ was considered statistically significant in all analyses, and confidence interval was accepted as 95%. A χ^2 test and Fisher exact test were used for categorical comparison.

RESULTS

A total of 26 children under 18 years of age who experienced an adnexal torsion were investigated. The mean age of the patients was 11.42 (range 2-16). The two groups were similar in age ($P = 0.29$). No difference of sides of the torsion was found between two groups ($P = 0.23$).

Group 1 consisted of 11 cases with the mean age of 10.7 (range: 6-13 years), who had undergone open oophorectomy for adnexal torsion. Their operative findings suggested gangrene and haemorrhagic infarction. The average time from the onset of symptoms to admission was 54 h (range: 24-96 h). The mean follow-up time was estimated as 54 months (range: 24-96 months). All cases had been preoperatively evaluated by ultrasound, and were diagnosed as adnexal torsion. There were seven left-side and four right-side adnexal torsions. Four of the cases with tumour markers were evaluated, but they yielded no increase. Histological examination revealed a mature teratoma in two cases and haemorrhagic necrosis due to torsion in nine cases [Figure 1].

All adnexa in Group 2 were untwisted using either an open or a laparoscopic approach. In Group 2, consisting of 15 patients, 10 of the cases were operated upon laparoscopically, five with an open approach [Figure 2]. The mean age of Group 2 was 11.87 (range: 2-16 years). The duration of the onset of symptoms was 34.25 h (range: 12-72 h). There were 12 left adnexal torsions, and 3 had right. A diagnostic ultrasound scan was done in all cases and yielded a correct diagnosis in all cases, except one. In the second group, the mean follow-up time was estimated as 35 months (range: 12-72 months).

After completion of the detorsion of the ovaries, they were biopsied peroperatively. Histopathological examination verified haemorrhagic necrosis in eight cases and a simple cyst in two cases [Figure 1]. All the adnexal cysts were found to be benign.

Of the 15 patients in Group 2, 10 responded to our request to undergo a routine postoperative ultrasonography evaluation. The median ultrasound evaluation time was estimated as 19.81 months (range: 4-27 months). At the time of the ultrasound examination, the involved adnexa had assumed a normal size and blood flow in nine patients [Figure 3]. In one patient, the affected adnexa was not detected by the ultrasound; however, magnetic resonance imaging showed a completely normal adnexa. In the last case, in spite of observing the ovarian circulation, high-resistance flow was also observed in early follow-up (postoperative 4th month)

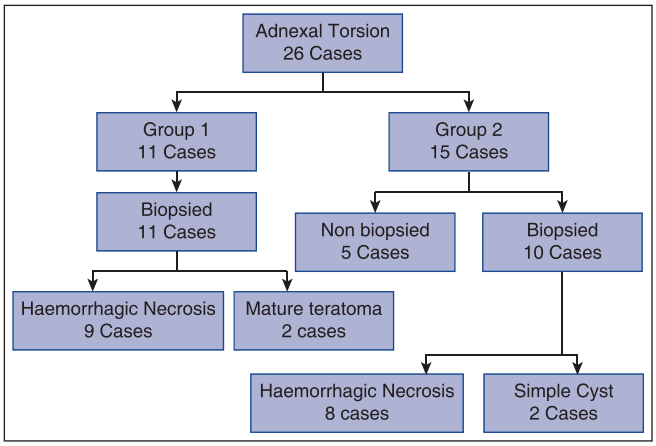


Figure 1: Histological examination of the cases

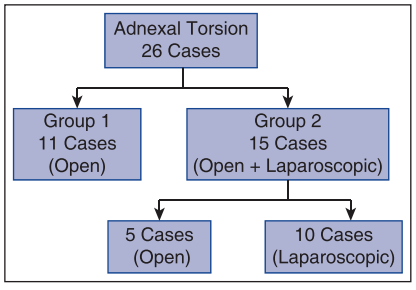


Figure 2: In Group 2, consisting of 15 patients, all adnexas were untwisted. Ten of the cases were operated upon laparoscopically, five with an open approach

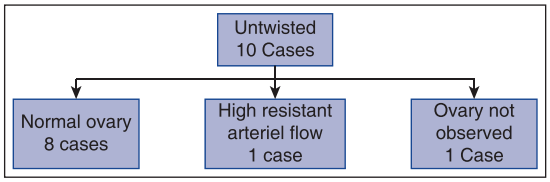


Figure 3: Radiology department ultrasound results of untwisted ovaries in Group 2

[Figure 2]. No malignancy or increase in tumour markers was noted. The patients have since been followed-up clinically and have remained asymptomatic.

DISCUSSION

The key to managing ovarian torsion is early diagnosis and immediate surgery.[6,7] In most operations, the surgeons selected to resect the twisted adnexa and to completely remove potential tumours or necrotic ovarian tissue on the basis that the circulation changes in the adnexa were irreversible.[8]

Due to recent publications on managing twisted adnexa, especially in adult patients treatment of adnexal torsion has changed.[9] Evaluation of either having or not having adequate blood flow in ovarian tissue is based on the surgeon's visual inspection at the time of operation or preoperative Doppler ultrasound. All these inspections can be misleading.[10] Haemorrhagic adnexa that is black in appearance does not always mean irreversible damage.[11]

Although untwisting of the ischemic adnexa has been found to be safe and successful in several studies, many surgeons continue to support the former belief that recovery of the twisted ovary is difficult due to the passage of time after the onset of the symptoms. Thus, they advise resection.[1] In our study, the interval between the onset of the symptoms and surgery did not affect the viability of the ovary, despite complete torsion of the adnexa.

In our study, untwisted ovaries regained their viability in the long term. In the light of these data, the preoperative symptomatic time cannot be seen as an appropriate guide for surgeons to predict ovarian viability. From our perspective, oophorectomies in twisted ovaries are unnecessary, even if they appear completely necrotic. Any treatment should focus on preserving the ovarian function. Therefore, a conservative approach to the management of adnexal torsion is warranted.

The limitations of this study are the low number of patients and since all the patients are prepubertal girls their ovarial function and number of follicles in adulthood are not evaluated. Furthermore, laparoscopic approach and detorsion is favoured in the recent years, earlier we were making oophorectomy to all this kind of patients.

Adnexal torsion is usually associated with a cyst or a tumour; before puberty, underlying malignant ovarian tumours are rarely detected.[5] Sommerville *et al.* reported that the risk of experiencing adnexal torsion with a benign ovarian neoplasm was 12.9-fold more than for malignant neoplasm.[12] Pelvic adhesions due to early invasion of adjacent tissue in malignancies can prevent the occurrence of adnexal torsion.[13] No malignancy in twisted adnexas in our series was observed. The malignancy rate in adnexal torsion has been reported to be only 3% in the literature.[11] Although tumour markers should be an integral part of the management and follow-up, cases show a benign character with the association of highly elevated CA-125; adnexal torsion in a paediatric patient was also reported.[14]

The majority of cases in both groups had haemorrhagic necrosis. In the light of these data, it is unnecessary to hesitate to untwist the adnexa because of fear of malignancy. Although malignancy in adnexal torsions is sometimes found in the paediatric age group, a biopsy can prevent any misdiagnosis in these rare cases.

We postulate that the untwisted adnexa should be left in place regardless of the preoperative degree of necrosis. Follow-up with analysis of tumour markers and radiological imaging may be appropriate. Although malignancies are rare in premenarchal girls, biopsies can be added to the diagnostic procedure for a more conservative approach.

REFERENCES

1. Aziz D, Davis V, Allen L, Langer JC. Ovarian torsion in children: Is oophorectomy necessary? J Pediatr Surg 2004;39:750-3.
2. Rody A, Jackisch C, Klockenbusch W, Heinig J, Coenen-Worch V, Schneider HP. The conservative management of adnexal torsion — A case-report and review of the literature. Eur J Obstet Gynecol Reprod Biol 2002;101:83-6.
3. Adelman S, Benson CD, Hertzler JH. Surgical lesions of the ovary in infancy and childhood. Surg Gynecol Obstet 1975;141:219-26.
4. Mage G, Canis M, Manhes H, Pouly JL, Bruhat MA. Laparoscopic management of adnexal torsion. A review of 35 cases. J Reprod Med 1989;34:520-4.
5. Wang JH, Wu DH, Jin H, Wu YZ. Predominant etiology of adnexal torsion and ovarian outcome after detorsion in premenarchal girls. Eur J Pediatr Surg 2010;20:298-301.
6. Hiei K, Takagi H, Matsunami K, Imai A. Ovarian torsion; early diagnosis by MRI to prevent irreversible damage. Clin Exp Obstet Gynecol 2010;37:233-4.
7. Houry D, Abbott JT. Ovarian torsion: A fifteen-year review. Ann Emerg Med 2001;38:156-9.
8. Sklar CA, LaQuaglia MP. The long-term complications of chemotherapy in childhood genitourinary tumors. Urol Clin North Am 2000;27:563-8.
9. Li YT, Kuon LC, Lee PN, Kuo TC. Laparoscopic detorsion of twisted ovary. J Chin Med Assoc 2005;68:595-8.
10. Smith CJ, Bey T, Emil S, Wichelhaus C, Lotfipour S. Ovarian teratoma with torsion masquerading as intussusception in 4-year-old child. West J Emerg Med 2008;9:228-31.
11. Stringer MD, Oldham KT, Mouriquand PD. Gonadal tumors. In: Valla JS, editor. Pediatric Surgery and Urology: Long Term

Outcomes. 2nd ed. Cambridge: Cambridge University Press; 2006. p. 707-23.
12. Sommerville M, Grimes DA, Koonings PP, Campbell K. Ovarian neoplasms and the risk of adnexal torsion. Am J Obstet Gynecol 1991;164:577-8.
13. Savic D, Stankovic ZB, Djukic M, Mikovic Z, Djuricic S. Torsion of malignant ovarian tumors in childhood and adolescence. J Pediatr Endocrinol Metab 2008;21:1073-8.
14. McCarthy JD, Erickson KM, Smith YR, Quint EH. Premenarchal ovarian torsion and elevated CA-125. J Pediatr Adolesc ecol 2010;23:e47-50.

Cite this article as: Yildiz A, Erginel B, Akin M, Karadağ CA, Sever N, Tanik C, *et al*. A retrospective review of the adnexal outcome after detorsion in premenarchal girls. Afr J Paediatr Surg 2014;11:304-7.

Source of Support: Nil. **Conflict of Interest:** None declared.