Brief Communication

Fertility after oophorectomy due to torsion

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ABSTRACT

Objectives: To investigate the prevalence of infertility in patients who underwent salpingo-oophorectomy due to adnexal torsion (AT).

Methods: All adult women admitted to the Teaching Institution of the University of Dammam, Dammam, Saudi Arabia who underwent surgery due to AT between January 2001 and 2010 were included. Complete data was collected from the time of admission to the follow up. The data was entered into the database and analyzed.

Results: The data of 26 patients was available for analysis. The mean age (±standard deviation) at presentation was 22.19±4.4 years, and average age at follow up was 34.81±5.75 years. The average delay in presentation was 37.76±47 hours, and the surgery was performed at 45.07±48.57 hours. The right side was involved in 13 (53.8%) of the cases. Fourteen (53.9%) women presented with infertility. Eleven (78.57%) were treated for infertility, and 5 (45.5%) conceived. Patients who were younger at the time of torsion fared better with regard to pregnancy (p<0.03, 95% confidence interval:-6.85; ≤0.58).

Conclusion Patients who undergo salpingo-oophorectomy for AT have an increased risk of infertility and should be warned of this impending complication.

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Adnexal torsion (AT) is a gynecological emergency, and occurs in approximately 2.7-3.5% of women of all ages.[1] Early diagnosis and adequate management is possible to prevent long-term complications, but the diagnosis is often delayed due to late presentation, time consuming referrals, and late surgical intervention. Even in early presentations, attempts for salvage of an ovary has had only meager results of approximately 10% in adults.[2,3] At present, it is recommended to take a more conservative approach with removing of the ovaries in children and adolescent patients who present with adnexal torsion and to untwist laparoscopically.[4,5] Many patients question the chances of conceiving with a single ovary, but the truth is there is no simple answer. It was reported[6] that women with one ovary have no way of increasing the primordial follicles in the other ovary; thus, this could affect fertility, whereas Bellati et al[7] believed otherwise. The prevalence of infertility in the Saudi Arabian population has reached 19%[8] as compared to the recent U.S. survey of 7.5%,[9] and most are the result of secondary causes, including surgical interference of the adnexa. Although there is limited data on the long-term fertility issues in patients with surgery due to AT and it has been advocated that the loss of a single ovary should not affect fertility; contrary to this, we observed patients with AT surgery presenting for infertility treatment. This study was carried out to investigate the prevalence of infertility among women who underwent salpingo-oophorectomy due to AT.

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Methods. After the approval of the Institutional Review Board, all adult women admitted to the Teaching Institution of the University of Dammam, Dammam, Saudi Arabia, who underwent surgery due to AT between January 2001 and December 2010 were studied in a retrospective cohort study following the principles of the Helsinki Declaration. A thorough search was carried out from the QuadraMed computerized-patient record system and the operating room logbooks to identify the patients. Patients who were pregnant or had previous pregnancies, and women in the postmenopausal age were excluded from the study. Complete data was collected from the time of admission to the follow up. Some of the information regarding the pregnancy was obtained by interviewing the patients. In patients who did not become pregnant spontaneously, the type of fertility was assessed and the treatment methods and protocols were collected. The data was entered into the database and analyzed using a t-test to compare means between age, delay in surgery, and the final outcome. The data was analyzed using the IBM SPSS Statistics for Windows, version 19.0 (IBM Corp, Armonk, NY, USA). A p-value <0.05 was considered statistically significant. Fisher exact test was performed for the side of the ovary removed and pregnancy.

Results. There were 41 patients admitted within the study period. Twenty-eight were nulliparous, 5

were married with children, and 8 were of pediatric age range, and thus excluded from the study. Two patients were lost to follow up. The sample size that was analyzed was 26. The mean age at presentation was 22.19±4.4 years and average age at follow up was 34.81±5.75 years (**Table 1**). The average delay in presentation was 37.76±47 hours, and the surgery was performed after 45.07±48.57 hours. The right side was involved in 13 (50%) cases. All patients had abdominal pain, 13 (50%) had vomiting, and 6 (23%) were febrile. The mean age at marriage was 25.73±3.81 years. Twelve women (46.1%) had spontaneous pregnancies, while 14 (53.9%) were infertile. The husbands of these women were normal after all the investigations. Eleven (78.6%) were treated for infertility. Three had pelvic adhesions on laparoscopy and 6 were normal. Five (45.5%) conceived, 3 after IVF, and 2 after ovulation induction and intrauterine insemination. Three women neither became pregnant nor received any treatment. There was no significant different between the age at which oophorectomy (p=0.604, 95% confidence interval: -17.37, ≤3.72) was carried out and the side of the ovary removed (p=0.4946 right side, and p=0.5006 left side by Fisher Exact 2 tailed test) (**Table 2**).

Table 1 - Demographic data of 26 patients admitted to the Teaching Institution of the University of Dammam, Dammam, Saudi Arabia, who underwent surgery due adnexal torsion.

Demographic data	Mean±SD
Mean age at presentation (years)	22.19 ± 4.4
Average age of follow up (years)	34.81 ± 5.75
Delay presentation (hours)	37.76 ± 47
Delay in surgery (hours)	45.07 ± 48.57
Side affected	12 right 14 left

Table 2 - Comparison between 26 patients with spontaneous and infertile patients admitted to the Teaching Institution of the University of Dammam, Dammam, Saudi Arabia, who underwent surgery due adnexal torsion.

Variables	Spontaneous pregnancy	Infertile patients	*P*-value (CI 95%)
Number of patients	12	14	
Age at marriage (years)	24.58±2.87	26.64±4.03	0.1
Age at follow up (years)	34.25±5.65	36.21±5	0.2
Age at torsion (years)	20.42±4.2	24.14±3.9	<0.03 (-6.85; ≤0.58)
Delay in final surgery (hours)	47.91±41.5	45.9±55.2	0.1
Right ovary removed	4	9	0 .4946
Left ovary removed	8	5	0.5006

95%CI - 95% confidence intervals

Discussion. Our study showed that women who had salpingo-oophorectomy carried a 53.9% increased risk of infertility. Additionally patients who were younger at the time of torsion and surgery fared better with regards to becoming pregnant, while those women who had a right-sided salpingo-oophorectomy had a reduced chance of pregnancy. Adnexal torsion is a gynecological emergency, which is well covered in the literature,[1,10,11] but there is limited data regarding incidence of women who fail to become pregnant after AT and salpingo-oophorectomy. In a recent report of 35 patients of unilateral ovariectomy, Bellati et al[7] found 86% of their patients who had an ovariectomy had at least one successful pregnancy, but in our patients only 46% became pregnant spontaneously.

There are conflicting opinions regarding the single ovarian hormonal function. The study of Zhai et al[12] found that the younger patient population, following a unilateral ovariectomy in childhood, maintained normal function in adulthood, but Lass et al[13] had earlier reported that women with a single ovary responded less to stimulation than women with 2 ovaries during in vitro fertilization treatment protocols. Hendricks et al[14] also suggested that women with a single ovary produced less oocytes, even after higher and longer doses of stimulation. It was found that women with a single ovary had higher basal follicle stimulating hormone (FSH) when compared with patients with both ovaries, and it was confirmed that higher FSH is an indicator of poor response for IVF protocols.[15] Unfortunately, we could not compare the age range of our patients, but we observed that patients who had their ovariectomy younger in life responded well. There is no comparative data available to confirm the dominance of one ovary over the other, or which is more important for conception. In this study, there were 14 patients whose right ovary was removed and had significantly lower pregnancy outcomes with the intact left ovary. Out of 12 patients that became pregnant spontaneously, 66.6% of them had their right ovary intact. Our study echoes the results of the study by Fukuda et al,[16] where they found that right side ovulation is more important for implantation and pregnancy in both naturally fertile women and those who are undergo IVF.

Our study has limitations. For one, it is retrospective in nature, and secondly it is only representative of a small number of patients. We believe that we have highlighted issues that need serious consideration. The best option is to preserve both ovaries and maintain full fertility in AT, but every attempt should at least be made to save as much of an ovary as possible. The first line of physicians, including emergency room, pediatricians,

and general surgeons, should be regularly reminded to suspect AT, particularly of the right side, as this could be easily misinterpreted as acute appendicitis. Children and women who have to lose an ovary should be warned of future fertility issues.

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