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Ovarian Torsion Management and its Effect on the Ovarian Reserve

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Abstract: ***Background: Ovarian torsion constitutes a gynaecological emergency most commonly seen in the reproductive age group. The aim of the study was to find out the ovarian reserve in the affected ovary after conservative surgery of ovarian torsion. Antral follicle count measured via transvaginal ultrasound was used for the same. Method: It is a retrograde study. All the cases with ovarian torsion who underwent conservative surgical procedure in the institute from January 2020 - January 2023 were studied. The demographic date, including patient's age, presenting complaints, Details of clinical presentation, laboratory findings like haemoglobin, leucocyte count and platelet count were noted. All the cases with features of sepsis and malignancy were excluded from the study. Antral follicle count was checked in the three month follow up ultrasonography. Results: In our study, all cases on follow up ultrasound had a follicle count between 6 - 12 in the affected ovary suggestive of preserved ovarian function. Conclusion: The study shows that conservative surgery following ovarian torsion had preserved ovarian reserve as observed by the antral follicle count in the preserved ovary on transvaginal ultrasound. We recommend it as the first line treatment irrespective of the intraoperative appearance of the ovary.***

Keywords: Ovarian torsion, conservative surgery, ovarian reserve, antral follicle count, transvaginal ultrasound

1. Introduction

Ovarian torsion constitutes 2.7% of gynaecological emergencies (1)

It is not age specific but most common in women of reproductive age, who are nulliparous or pregnant. The average age of a woman with ovarian torsion is in her late 20s, with vast majority of cases occurring in women under 40 years of age (2)

Pregnancy is a risk factor for torsion (odds ratio: 18: 1); however, it remains an uncommon event (0.167%). The risk of torsion in a patient who presents in early pregnancy is 0.002%. (2)

Ovarian torsion is caused by the twisting of the ovary on its vascular pedicle, leading first to lymphatic and venous congestion and then to the arterial blood supply becoming compromised, resulting in tissue necrosis (3)

Most cases of torsion occur in ovaries containing masses, such as functional cysts and neoplasms. Torsion is reportedly more common on the right side due to absence of sigmoid colon, thus allowing more movement. (4)

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. The usual presentations of an adolescent girl with ovarian torsion include abdominal pain lasting a few hours, nausea, vomiting, and fever. Right sided torsion can mimic appendicitis and hence should be ruled out (3) Intensity, nature, location, and duration of pain can vary greatly from patient to patient with ovarian torsion (5). Other pain characteristics, such as lateralization, migration and associated symptoms, were seen (4).

Abdominal ultrasonography (AUS) along with doppler studies is the modality of choice in the evaluation of the young female pelvis, providing clear visualization of the pelvic organs with no exposure to radiation, in addition to being highly available (6) However, use of colour Doppler imaging has some controversies as the presence of vascular flow does not rule out torsion (3)

Ovarian torsion requires immediate attention. Earlier it was believed that due to conservative management of torsion i. e detorsion, there is a higher risk of thromboembolism due to untwisting of the ovarian pedicle. However, enough literature is currently available to prove that the risk of this is very low and hence detorsion is a relatively safer option. Therefore, early diagnosis and prompt surgical evaluation remain key to optimizing long - term ovary function, regardless of the appearance of the ovary at operation. (7) Laparoscopy when compared to laparotomy in the surgical treatment of torsions is associated with less postoperative pain, more patient satisfaction and less hospitalization period. (1)

Torsion and detorsion can cause ischemic perfusion injury to the ovary and thus affect the ovarian reserve. In clinical practice, looking for follicular count through vaginal ultrasound is direct measure of ovarian function. (14)

This is used in the given study to find out the effect of conservative management in cases of ovarian torsion on the ovarian reserve.

2. Methodology

This study was undertaken after clearance from the ethics committee of MGM Institute.

This study has been undertaken in the obstetrics and gynaecology Department of MGM women and children hospital, Kalamboli. It is a retrograde study. All the cases with ovarian torsion who underwent conservative surgical procedure in the institute from January 2020- January 2023 were studied. The demographic date, including patient's age, presenting complaints, Details of clinical presentation, laboratory findings like haemoglobin, leucocyte count and platelet count were noted. All the cases with features of sepsis: Temperature >100.4 F, Leucocyte count > 30, 000/ microlitre and needed ICU admission were excluded from the study. Patients with higher suspicion of malignancy in the ovarian cysts associated with torsion were also not included in the study.

Transvaginal Ultrasonography report of the affected ovary was studied for all these patients after a three month period, postoperatively and the antral follicle count was noted.

Case No.	Age	Parity	Pregnant	Location of torsion	Diagnosis	Laparoscopy Or Laparotomy	Management	Antral follicles on follow up TVS
1	26years	Primigravida	Yes	Left	USG s/of left sided Ovarian torsion	Laparotomy	Exploratory laparotomy with left ovarian detorsion	12
2	21years	Primigravida	Yes	Right	USG s/of right ovarian torsion	Laparotomy	Exploratory laparotomy with right ovarian detorsion	8
3	35years	P1L1	No	Right	USG s/of right ovarian mass with torsion	Laparotomy	Right ovarian detorsion with right sided cystectomy	6
4	16years	Nulligravida	No	Left	USG s/of Left ovarian torsion	Laparoscopy	Laparoscopy with left Ovarian detorsion	10
5	24years	Primigravida	Yes	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	8
6	33 years	P2L2	No	Right	USG s/of Right ovarian cyst	Laparotomy	Exploratory laparotomy with right Ovarian detorsion with cystectomy	7
7	26years	P1L1A1	No	Right	USG s/of Right ovarian cyst	Laparotomy	Exploratory laparotomy with right ovarian detorsion with cystectomy	7
8	30yr	P2L2	No	Right	USG s/o Right Ovarian cyst	Laparoscopy	Laparoscopy with right ovarian detorsion and cystectomy	8
9	29yr	P2L2	No	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	5
10	36yrs	P3L2d1	no	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	08
11	37yrs	P2L2	No	Left	USG s/o left ovarian torsion	Laparoscopy	Laparoscopy with left sided ovarian detorsion	06
12	39yrs	P3L3	No	Right	USG s/o right ovarian torsion	Laparoscopy	Laparoscopy with right sided ovarian detorsion	05
13	38yrs	P3L3	No	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	10
14	34yrs	P1L1	No	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	07
15	47yrs	P2L2	No	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	10
16	29yrs	P1L1	No	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	08
17	20yrs	Nulligravida	No	Right	USG s/o right ovarian torsion	Laparoscopy	Laparoscopy with right sided ovarian detorsion	06
18	32yrs	P2L2	No	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	09
19	24yrs	P1L1	No	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	07
20	22yrs	Nulligravida	no	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	08
21	24yrs	Nulligravida	No	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	08

22	22yrs	Nulligravida	No	Right	USG s/of Right ovarian torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion	07
23	21yrs	Nulligravida	No	Left	USG s/o left ovarian cyst with partial torsion	Laparotomy	Exploratory laparotomy with left ovarian cystectomy	08
24	22yrs	P1L1	No	Left	USG s/o left ovarian cyst with torsion	Laparotomy	Exploratory laparotomy with left ovarian cystectomy and ovarian detorsion	06
25	27yr	P1L1	No	Right	USG s/of Right ovarian cyst with torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion with cystectomy	10
26	22yr	P2L2	No	Right	USG s/of Right ovarian cyst with torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion with cystectomy	08
27	30yr	P3L3	No	Right	USG s/o right ovarian torsion	Laparoscopy	Laparoscopy with right sided ovarian detorsion	08
28	28yr	P2L2	No	Right	USG s/of Right ovarian cyst with torsion	Laparotomy	Exploratory laparotomy with right Ovarian detorsion with cystectomy	05
29	24yr	P2L2A1	No	Right	USG s/of Right ovarian cyst with torsion	Laparotomy	Exploratory laparotomy with right ovarian detorsion with cystectomy	05
30	26yr	P1L1	No	Right	USG s/of right ovarian mass with torsion	Laparotomy	Right ovarian detorsion with right sided cystectomy	08

3. Results

In our study we have taken 30 cases of ovarian torsion.

In our study all the cases are in the reproductive age group and the median age of presentation is 27yrs (16 - 47years) with pain abdomen as the most common presenting complaint. Twenty four out of the thirty cases presented with complaints of abdominalpain, ten out of them had complaints of associated vomiting.

Three out of all the cases had leucocytosis but no history of fever was present in any of the cases.

In our study, three cases were seen in second trimester of pregnancy

Amongst all the cases of ovarian torsion, only one was seen in an adolescent female

Six cases were seen in nulligravida females while all other cases were seen in parous females.

Only 16.66% of the cases had left sided ovarian torsion.

All patients had ultrasonography reports. Twenty six out of the thirty (86.6%) cases were radiologically proven ovarian torsions out of which one was a radiologically diagnosed partial torsion.

Out of all the cases five cases underwent laparoscopic detorsion, rest all the cases underwent exploratory laparotomy.

In all the cases taken for this study, irrespective of the appearance of the ovary, the ovaries were preserved and only cystectomy with ovarian detorsion was done.

On 3 monthly follow up transvaginal scans, 24 out of 30 patients had antral follicle count between 5 - 8 in the affected ovary, suggestive of normal ovarian reserve while the rest of them had follicular count above 8 in the affected ovary, suggestive of preserved ovarian reserve.

4. Discussion

Ovarian torsion is rare entity and constitutes 2.7% of all gynaecological emergencies (1).

Ovarian torsion is due to twisting of the ovary on its vascular pedicle, which leads to lymphatic and venous congestion to begin with followed by the arterial blood supply becoming compromised, resulting in tissue necrosis (3) The common complaints with ovarian torsion include abdominal pain lasting a few hours, vomiting, nausea and fever. Differential of right sided torsion can be appendicitis and therefore should always be excluded. (3)

The diagnosis of ovarian torsion is usually made with ultrasonography. The sensitivity of ultrasound in diagnosing torsion ranges from 40 - 75% (8)

In our study we have taken 30 cases of ovarian torsion.

In our study all the cases are in the reproductive age group and the median age of presentation is 27yrs (16 - 47years. In a similar study conducted in a hospital in france, the median age of presentation was 11 years of age but the study was conducted in the paediatric department (9) . In another study by Sobha Nair, Smitha Joy, Jayashree Nayar, the median age was 25.5 years, two out of all the cases were premenarchal and twelve were postmenopausal. (10)

In another study by Ziv Tsafrir, Foad Azem, Joseph Hasson, Efrat Solomon, BSc, Benny Almog, Hagith Nagar, Joseph B. Lessing, and Ishai Levinthe incidence of ovarian torsion

without any underlying abnormality, was found to be higher in premenarchal girls when compared to adolescent girls. However, in our study, no case of ovarian torsion in premenarchal girls was seen. (11)

In our study, all but three cases were seen in non - pregnant woman. In our study the torsion was seen in the second trimester while in another study by Sobha Nair, Smitha Joy, Jayashree Nayar, ovarian torsion was more commonly seen in the first trimester of pregnancy. . (10)

Amongst all the cases of ovarian torsion, only one was seen in an adolescent female while six cases were seen in nulligravida females while all other cases were seen in parous females

In our study, only 16.66% had left sided ovarian torsion similar to the study by osman Balci, Mehmet S. Icen, Alaa S. Mahmoud, Metin Capar, Mehemet C. Colakoglu in whichright sided ovarian torsion was more common. More incidence of ovarian torsion on the right side can be attributed to the absence of sigmoid colon on the right side, thus allowing more movement (12)

The most common presenting complaint in our study is abdominal pain. Twenty four out of the thirty cases presented with complaints of abdominal pain, ten out of them had complaints of associated vomiting. In another study by Ziv Tsafrir, MD*, Foad Azem, MD, Joseph Hasson, MD, Efrat Solomon, BSc, Benny Almog, MD, Hagith Nagar, MD, Joseph B. Lessing, MD, and Ishai Levin, MD, pain abdomen and vomiting was the most common presenting complain and associated fever was seen in 9% of the cases (11). However, in our study, no patient had complaints of fever on presentation.

All patients had ultrasonography reports. All patients had ultrasonography reports. Twenty six out of the thirty (86.6%) cases were radiologically proven ovarian torsions out of which one was a radiologically diagnosed partial torsion. However, unfortunately none of the cases had doppler studies. Studies have shown controversy with use of doppler study as presence of vascular flow doesn't necessarily rule out ovarian torsion. (3)

In our study, 100% patients were managed surgically. Although laparoscopy is the preferred method of choice, only five out of all the cases were managed via the laparoscopic route. In a study by Osman Balci, Mehmet S. Icen, Alaa S. Mahmoud, Metin Capar, Mehemet C. Colakoglu it was noted that laparoscopic surgery is preferred for young patients who wish to preserve their fertility, but ovarian masses presenting with torsion after menopause should be evaluated with frozen section whenever possible. If it is not possible or is inconclusive, staging surgery is more appropriate when there is high suspicion of malignancy. (12)

Ovarian reserve is assessed based on the quality and quantity of the primordial follicles. In this study, the number of antral follicles were noted as an indicator to assess the ovarian reserve, postoperatively. In our study, despite of whatever the intraoperative appearance of the ovary was, ovary was preserved irrespective, contrary to the belief earlier that detorsion of pedicle increases the risk of thromboembolism (7). Only detorsion with cystectomy was performed. In a study conducted in france, it was noted that out of the 11 ovaries removed intraoperatively due to their bluish black appearance, 7 of them had viable ovarian parenchyma on the surgical specimen. Thus, the series confirms that conservative approach of black - bluish ovaries after detorsion is safe and effective. (13)

A follow up transvaginal scan was done in all the cases in our study and it was found out that all the cases had 6 - 12 antral follicles in the preserved ovary, thus pointing towards the preservation of the fertility of the patients.

Conflict of interest: Nil

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