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Outcome of Conservative Laparoscopic Approach in Pediatric and Adolescent Ovarian Torsion: Retrospective Cohort Study

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ABSTRACT

Objective: This study aims to find out the clinical features and outcome of conservative laparoscopic management in adolescent females diagnosed as a case of ovarian torsion with special emphasis on management of blue black gangrenous looking ovaries.

Methodology: It was a retrospective, hospital based, cohort study. Adolescent girls (12-18 years) diagnosed with ovarian torsion were assessed regarding mode of presentation, duration, imaging, laparoscopic findings, management and outcome.

Main Results: Among all patients presenting to this institution with ovarian torsion over a four year time period, 34.14% (N = 14/41) were adolescents. All the girls presented with lower abdominal pain along with vomiting. Duration of symptoms ranged from 1-5 days. There was predilection for right sided ovarian torsion (71.4%, N = 10/14). In all the cases laparoscopic ovarian detorsion was done and ovary was either fixed to posterior aspect of uterus or ovarian ligament to prevent retorsion. Ovaries of 6 girls were gangrenous looking, of which one was premenarchal. All the patients had a satisfactory outcome with normal ovarian follicles at 3 months on follow-up ultrasound scan (done in 12 patients).

Conclusion: Laparoscopic detorsion of the ovaries with or without concurrent cystectomy is the mainstay of treatment in adolescent ovarian torsion. Ovaries should be preserved in all the cases of adolescent ovarian torsion as the return of function have been observed in most of the cases.

Keywords: Ovarian torsion, Laparoscopy, Detorsion, Oopheropexy.

INTRODUCTION

Ovarian torsion is a surgical emergency. It is seen in all age groups from adolescents to postmenopausal women and is reported to be fifth most common gynecologic emergency. Ovarian torsion in adolescents is relatively uncommon. Its incidence among females of less than 20 years of age is 4.9/100,000.¹ Approximately 0.02% of the pediatric and adolescent females presenting with acute abdominal pain in emergency suffer from ovarian torsion.² It can involve ovary, fallopian tube or both leading to impaired venous and arterial blood flow

in succession leading to ischemia and necrosis of tube and ovary in long standing cases.

Although the symptoms and the signs of the ovarian torsion are same in all age groups, still the diagnosis is difficult in the adolescent group because of limited

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gynecological examination. Urgency of intervention in ovarian torsion to save the ovarian function in younger age group needs prompt diagnosis. This study aims to find out the clinical features and outcome of conservative laparoscopic management in adolescent females with diagnosis of ovarian torsion with special emphasis on management of blue black gangrenous looking ovaries.

METHODOLOGY

It was a retrospective study from 2015 to 2019 done in the department of Obstetrics and Gynecology, Hamdard institute of Medical Sciences and Research, New Delhi. The study was approved by Institutional Ethical Committee, Jamia Hamdard. Total 41 women were diagnosed as a case of ovarian torsion during the study duration. Out of these 14 were adolescent girls. Records of these girls were assessed regarding age, menarche, mode of presentation, duration, imaging, laparoscopic findings, management and outcome. On follow-up visits, these girls were assessed for menarche, menstrual cycle, persistent pain abdomen, need of relook surgery, and ultrasonographic evaluation of the ovaries after 3 and 6 months of ovarian detorsion.

RESULT

Among all patients presenting to this institution with ovarian torsion over a four-year time period, 34.14% (N = 14/41) were less than 18 years. Age range of the study group was 4-17 years with 4 premenarchal girls who presented in the surgical emergency. Table 1 delineates the clinical features of the 14 adolescent girls with ovarian torsion. All the girls presented with lower abdominal pain along with vomiting. The diagnosis of ovarian torsion was made on ultrasound in all the cases. Table 2 delineates the operative findings (Figs. 1 to 3). There was predilection for right sided ovarian torsion (71.4%, N = 10/14). In all the cases laparoscopic ovarian detorsion was done and ovary was either fixed to posterior aspect of uterus or ovarian ligament to prevent retorsion in cases where cystectomy was not done. Ovaries of 6 girls were gangrenous looking (blue black color, Figs. 1 to 4) and in all these cases ovaries and fallopian tubes were observed for 15-20 minutes for color to return. After observation some amount of black discoloration disappeared from the medial side of

Table 1

Clinical features of the study group

Clinical features	N	%
Pain	14	100%
• Site specific	8/14	57%
• Diffuse pain	6/14	43%
Vomiting		100%
Fever	4/14	28.6%
Symptom duration	1-5 days	
Presentation other than gynae department	7/14	50%
Precipitating event	In 2 dance and yoga practice for school event	
Tachycardia	4/14	28.6%
Abdominal tenderness	8/14	57%
Abdominal lump	0	0
Per rectal examination (done in 6)	6/6	100%

Table 2

Peroperative findings and outcome

	N = 14
Right ovarian torsion	10
Left ovarian torsion	4
Parovarian cyst	2
Ovarian cyst	4
Solid ovarian tumor	0
Bluish black ovary	6
Mullerian anomaly	1
Ovarian ligament fixation	1
Fixation to posterior surface of uterus	7

the tube and ovaries of all these cases were conserved. All the patients had a satisfactory outcome and none of the patients had retorsion. On follow-up ultrasound at 3 months ovarian follicles were seen developing normally indicative of normal ovarian function. Two premenarchal girls had their menarche after 6 and 8 months of surgery respectively.

DISCUSSION

In our study the incidence was 34.14% among all cases of ovarian torsion. In young girls, torsion on a normal ovary is more frequent because of greater length of the ovarian ligament as seen in one of our case where

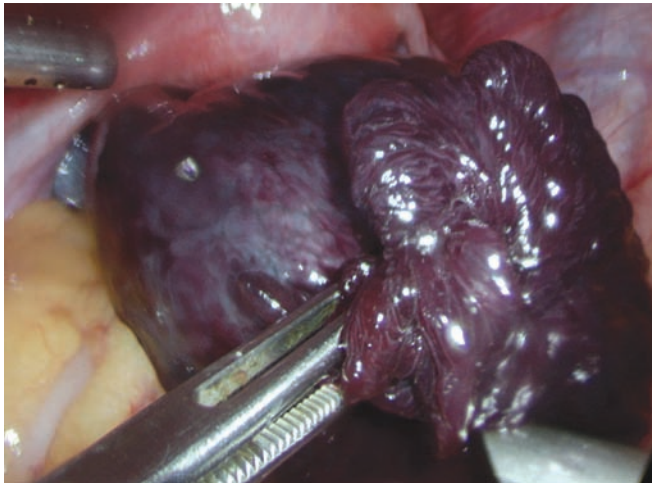


Fig. 1: Gangrenous fimbrial end in case of tubo-ovarian torsion

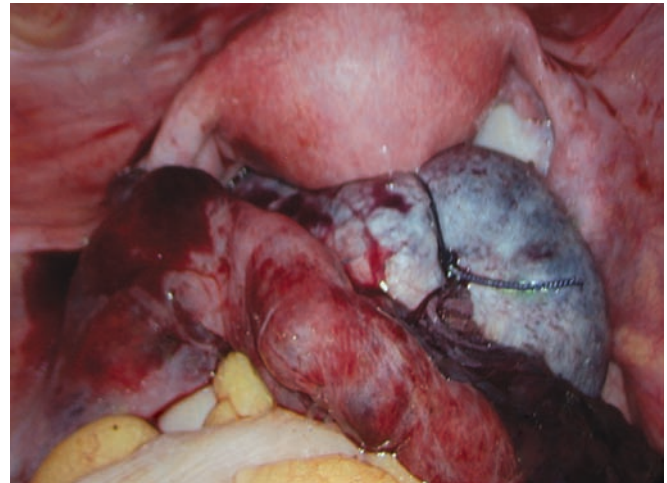


Fig. 4: Fixation of left blue-black ovary to the posterior aspect of the uterus

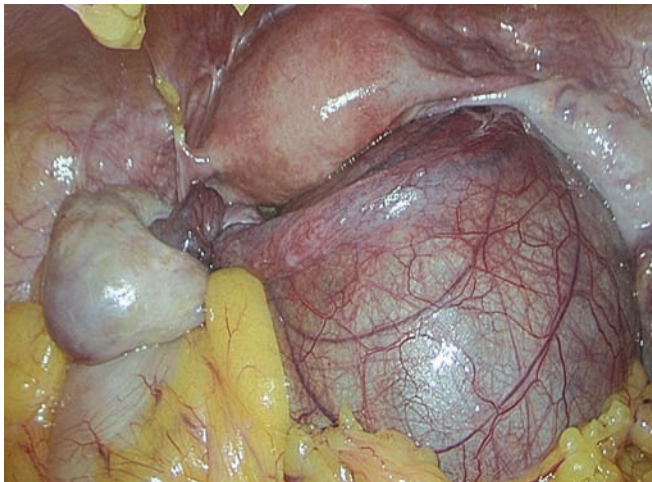


Fig. 2: Left tubo-ovarian torsion due to parovarian cyst

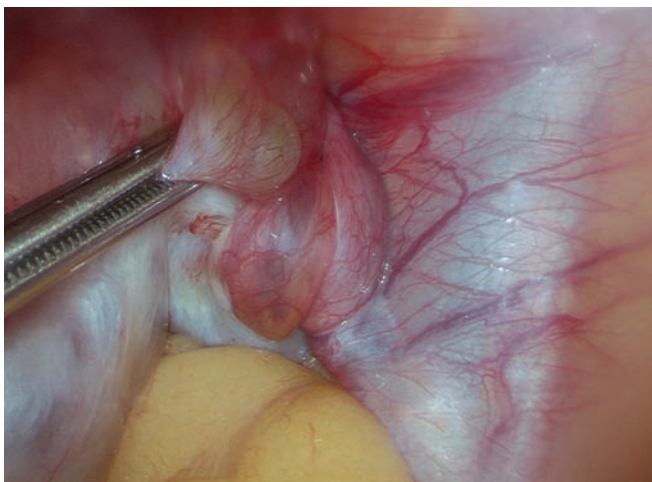


Fig. 3: Right tubo-ovarian torsion with enlarged ovary

ovarian ligament plication was done. Ovarian torsion is seen in almost 2.7% of all cases presenting with acute abdomen in adolescents.^{3,4} An abnormally long fallopian tube, mesosalpinx, or meso-ovarium also cause an excess of mobility of adnexa and higher risk of torsion.⁵⁻⁷

Abdominal pain and vomiting are the main symptoms in cases of ovarian torsion. The differential with surgical cause must be kept in mind whenever right sided pain is present. Mean age in our study was 12.14 years, however the largest study of pediatric ovarian torsion reported mean age of 9.2 years whereas other studies have found mean age from 9 to 12.5 years.^{3,8,9} We have found right sided preponderance for the ovarian torsion. This might be due to the hypermobility of the caecum and ileum on right side as compared to relatively fixed sigmoid colon on the left side. Ultrasound with color Doppler is the mainstay in diagnosis where the absence of blood flow through the ovarian pedicle is observed. MRI can aid in the diagnosis in case of doubt but is not available everywhere.¹⁰

The mainstay of the treatment is laparoscopic ovarian detorsion which has been performed in all the cases with a successful outcome even in a case of blue black gangrenous looking ovaries. Ovarian detorsion is associated with theoretical risk of pulmonary embolism but no case of pulmonary embolism has been reported with the ovarian detorsion till date. Literature search reveals only 2 cases of suspected pulmonary embolism in case of ovarian torsion but in both cases, oophorectomy has been performed.¹¹ Thus,

it is recommended that ovarian detorsion should not be prohibited with the theoretical risk of embolism.

It is recommended that after detorsion, cystectomy should be performed if the cyst is present. But many a times it is not possible in presence of hemorrhage, edema, congestion due to venous occlusion especially in blue black gangrenous ovaries. Oophorectomy is not justified in any case even in the gangrenous ovary as return of the ovarian function has been observed in all the 3 cases of gangrenous ovaries in our study. Moreover, the chances of malignancy in the ovaries in these cases is reported to be 0.4-1.8% in adolescents and that too with only with large mass of size more than 8 cm.^{1,8,12}

Another area of controversy in the management of ovarian torsion is performance of oophorectomy. The literature is divided over it and the authors in favor of this proposes to have lower chance of recurrence and the against it suggests that ovarian fixation might inhibit the blood supply and therefore the fallopian tube growth.¹³ We have performed ovarian fixation to the ovarian ligament or posterior surface of uterus.

Performing oophorectomy in the blue black ovary has been favored by few that there might not be any residual ovarian function after detorsion and the chance of peritonitis and infection will be there. But now it has been clearly evidenced that the arterial supply is maintained for more than 72 hours and in large series of cases the return of ovarian function has been demonstrated.^{3,14} In our study out of 7 cases, we had 3 cases of blue-black ovary and all showed presence of ovarian follicle after 3 months of surgery as evidenced on ultrasound. Thus, it has been proposed the evidence of blue-black ovary should not solely determine the oophorectomy by the surgeon and one should try to save the ovary as far as possible.

Another area of controversy which has not been discussed anywhere in the literature is that most of the times the tubes are also twisted in the cases of ovarian torsion and appear black. The question remains whether their function will return or not. In our experience when the twisted pedicle is detorsed, it is the tube which gains supply first and its medial part shows change in color which might be the evidence of regaining vascularity. As such there is no non-interventional imaging modality where the nonpathological tubes can be visualized. Ultrasonography after 3-6 months of surgery is a good

modality to assess the ovarian recovery by the evidence of ovarian follicles.

CONCLUSION

The current study as well as literature clearly shows that the ovaries should be preserved in all the cases of adolescent ovarian torsion as the return of function have been observed in most of the cases. Laparoscopy is the preferred route of surgery. Simultaneous fixation may be performed to prevent recurrence but there is no evidence in support. Gross appearance of blue-black ovary should not be the criteria for the removal in cases of ovarian torsion. Conserving ovary of adolescent girls for their physiological development and later for maintaining fertility reserve by performing conservative laparoscopic surgery in contrast to radical surgery is an unparalleled approach.

Source of Support

Nil

Conflicts of Interest

There are no conflict of interest.

Financial Disclosure

None

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