

Antenatally Diagnosed Ovarian Cysts with Torsion Managed Laparoscopically

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ABSTRACT

Aim and objective: To study the various types of laparoscopic management of antenatal ovarian torsion, their advantages, disadvantages, and its outcome in pregnancy.

Background: Ovarian torsion in pregnancy occurs at a rate of about 1 in 5,000 cases. It is a life-threatening condition if not attended to and intervened promptly. Recent years have seen the advent of laparoscopy as a preferred means of management for ovarian torsion in pregnancy. This review article analyzes a series of articles over a span of 5 years from 2014 to 2018 on laparoscopic management of ovarian torsion in pregnancy and its outcome.

Results: Various procedures like ovarian detorsion, cystectomy, ovarian cyst puncture, ovariopexy, shortening of the utero-ovarian ligament, and oophorectomy are performed by expert hands. While advantages include quick recovery and early discharge from hospital, disadvantages are a long learning curve and increased need for training. This has led to many uneventful pregnancies with term live births.

Conclusion: Each type of laparoscopic management for antenatal ovarian torsion has its pros and cons. Nevertheless, the outcome of the pregnancy has been excellent in the majority of the laparoscopically managed cases.

Clinical significance: Laparoscopic management of antenatal ovarian torsion has reduced intraoperative blood loss, improved postoperative pain, and led to a quick recovery, early discharge from hospital, and return to daily activities. Clinicians need to be adequately trained to be competent in performing various laparoscopic surgeries.

Keywords: Antenatal ovarian torsion, Laparoscopic ovarian detorsion, Utero-ovarian ligament.

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BACKGROUND

Ovarian torsion is a common gynecological emergency. It is found to be the fifth most common gynecological surgical emergency.^{1,2} This involves the twisting of the ovary in its pedicle, leading to ovarian infarction if it is not unwound in time. Prompt identification and intervention are crucial in the management of ovarian torsion. Nevertheless, the clinical presentation can present as a diagnostic challenge for clinicians. Studies have shown 23–66% of cases were given accurate presurgical diagnosis.³ Transvaginal ultrasound is the most widely used imaging modality to confirm clinical findings though it can be inconclusive at times.⁴ Laparoscopy has enhanced the efficacy of management of ovarian torsion in pregnancy with advantages like less pain, speedy recovery, and shorter hospital stays⁵ with an uneventful pregnancy.

RESULTS

This review article analyzes a few articles related to laparoscopic management of ovarian torsion in pregnancy over 5 years between 2014 and 2018 to study its efficacy and its outcome in pregnancy. It includes retrospective case–control study, single-center study, and case reports that were selected manually from PubMed online. The results of the analysis of the selected articles are explained below with regards to various laparoscopic techniques in the management of ovarian torsion which ranges from ovarian detorsion, cystectomy, ovarian cyst puncture, ovariopexy, oophoropexy, shortening of the utero-ovarian ligament and oophorectomy, their advantages and disadvantages, and finally the outcome of pregnancy following the minimally invasive procedure.

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Management of ovarian torsion during pregnancy aims at saving not only the ovary but also the current and future pregnancies. Early intervention helps to possibly retain blood supply to the ovary and thereby avoiding oophorectomy due to gangrenous changes. Unwinding the torqued utero-ovarian ligament re-establishes the blood supply. Oelsner et al.⁶ did a retrospective analysis of 102 patients managed with surgical interventions for adnexal torsion. They reported that 91.3% of patients with bluish-black ovary regained normal function following detorsion. None of the patients developed pelvic or systemic thromboembolism which is a risk presumed to occur following detorsion of the adnexa.

At times, cystectomy is required in the case of a simple ovarian cyst or dermoid cyst. Ding et al.⁷ had suggested removal of dermoid cyst in an endobag to avoid spillage into the abdominal cavity through laparoendoscopic single-site surgery (LESS).⁷

This procedure has been extensively studied as a safe mode of management as it involves easy removal of the specimen. With LESS, abdominal entry is safely accomplished using an open-entry technique. No additional incisions or ports are required. Also, it enhances the safety of the open-entry technique and facilitates directly visualized fascia closure. This is a relatively new technique that has been considered for surgery between 10 weeks and 20 weeks.⁸ One concern with regards to LESS is the possibility of umbilical hernia, especially because of the laxity and abdominal stress during pregnancy. Nevertheless, a recent report revealed an overall low risk of umbilical hernia with the LESS procedure with a running mass closure with delayed absorbable suture.⁹ Other drawbacks are technical difficulties and limited working space.

Blind abdominal access techniques, such as, direct insertion of trocars or use of a Veress needle should be performed carefully to avoid causing injury to the enlarged gravid uterus or displaced viscera. One should aim to practice minimal handling of the gravid uterus in any laparoscopic management of ovarian torsion.

Ovariopexy involves the fixation of the ovary to the abdominal wall. Munshi et al.¹⁰ have done ovariopexy after ovarian detorsion and puncture of bilateral torted ovarian cyst in a case of spontaneous ovarian hyperstimulation syndrome in a singleton pregnancy. This secures the ovaries to its anatomical sites, reducing the recurrence of torsion.

Hosny¹¹ has illustrated oophoropexy as a method of management in emergency cases of ovarian torsion. This involves the fixation of the ovary by transfixing the trocar site closure needle with absorbable vicryl 2-0 suture through the ovary then picking the suture from another transfixing point through the ovary then tying the suture out around the sheath. Oophoropexy is a debatable procedure. While it is easier, faster, and more comfortable for managing ovarian torsion in pregnancy, it requires more training for suturing by laparoscopy.

Weitzman et al.¹² have elaborately explained about the shortening of the utero-ovarian ligament by laparoscopic Endoloop as an alternative to oophoropexy in the management of recurrent ovarian torsion. In this novel approach, a grasping forceps was passed through an Endoloop and then used to tent up the utero-ovarian ligament in the midsection. The Endoloop was then tightened, pulling the ovary close to the uterus, and shortening the utero-ovarian ligament. This method decreases ovarian mobility and the risk of bleeding. As much as this technique sounds promising, technical expertise is required and surgeons have to be trained appropriately.

Adnexal torsion with or without additional surgical procedures does not have much of an effect on the gestational age at delivery. Neither does it cause any adverse maternal or fetal outcome. Daykan et al.¹³ did a retrospective case-control study of pregnancy outcomes after surgical intervention for adnexal torsion, in which both study and control groups provided similar results. The gestation age at delivery was around 38 weeks in both groups, so was the rate of preterm delivery. Also, there was no significant difference between the two groups in terms of neonatal outcome. Postoperatively, there was a 3.5% first-trimester miscarriage. This study further emphasizes the efficacy and safety of laparoscopic management of ovarian torsion in pregnancy.

DISCUSSION

Torsion of the ovary is more commonly seen in the right ovary than the left ovary as the right tubo-ovarian ligament is longer

and also due to the presence of a sigmoid colon on the left side. It is also evident in a patient with a history of *in vitro* fertilization and ovarian hyperstimulation syndrome.^{10,14-16} As the ovary enlarges, it twists on its vascular pedicle and undergoes torsion. Pregnancy itself increases the risk of ovarian torsion. Other factors identified include the previous cesarean section and large ovaries, ovarian tumors, and prior tubal ligation. Intraoperatively, findings range from a mature teratoma like a dermoid cyst,⁷ simple ovarian cyst,¹⁷ benign para-ovarian cyst, and corpus luteal cyst.¹⁸

This condition is more commonly seen in the reproductive age group though it can be seen in any age group. Also, in pregnancy, it is encountered mostly during the first trimester with a few cases seen in the second trimester as well. While some antenatal women have unilateral ovarian torsion, bilateral torsion has also been cited, not to mention the recurrence of torsion on the same or contralateral side.¹²

Antenatal women usually present with abdominal pain, nausea, and vomiting with tenderness and rebound tenderness on abdominal palpation. However, clinical findings alone can be misleading, involving a spectrum of differential diagnoses. Hence, a transvaginal ultrasound plays a pivotal role in contributing to the clinical diagnosis. Doppler ultrasonography is highly specific for the adnexal torsion, but it is not a sensitive test.¹⁹ Arterial blood flow may be seen in adnexal torsion cases, leading to false-negative results. The presence of flow does not exclude the torsion, instead suggests the viability of the ovary. Since torsion may be intermittent or one of the arteries may be twisted (uterine or ovarian) or only venous thrombosis may occur, blood flow may be observed in Doppler findings. The sonographic diagnosis is inaccurate in a third of cases.²⁰ Torsion without the involvement of the ovary does not exhibit any of the classic ultrasound findings other than a torted pedicle and therefore a sonographic diagnosis may be difficult. Discolored ovaries had a normal appearance at future surgeries, reinforcing the concept that an oophorectomy (after detorsion) should be the exception rather than the rule even if the ovary is bluish-black. This has some implications in our clinical practice. Training in pelvic ultrasound to complement clinical judgment and regular audits of treatment must be conducted to minimize pitfalls in diagnosis and management. An ultrasound examination cannot be used as a sole diagnostic criterion to confirm or exclude torsion and a clinical assessment takes precedence.

Until 1989, salpingo-oophorectomy has been the standard method of management for ovarian torsion until Mage et al.²¹ introduced ovarian detorsion as a conservative alternative method for the same condition. This has proved to be a great success as the majority of ovarian torsion occurs in the reproductive age group where fertility is the main concern. By preserving the ovaries, one avoids premature ovarian failure and its consequences. In certain situations, even if the ovaries appear bluish-black or hemorrhagic intraoperatively, detorsion has been fruitful. The ovarian function has been observed following that in subsequent transvaginal ultrasound for follicular study, future unrelated laparotomy, and *in vitro* fertilization. As much is said regarding the benefits of detorsion, the risks associated with this procedure include sepsis, peritonitis due to toxins released by the ovary following reperfusion, and probable pulmonary embolism.

While laparoscopic ovarian detorsion helps to restore blood supply to the ovaries and preserve its function, one cannot predict the possibility of retorsion of the same ovary in the future. There are many novel approaches found by experts to prevent detorsion,

some of them being ovariopexy, oophoropexy, and shortening of the utero-ovarian ligament. These upcoming procedures can be promising but require clinicians to be adequately trained in performing them in an emergency.

Follow-up of patients managed laparoscopically for ovarian torsion in pregnancy is crucial. Postoperatively, they should be briefed about warning symptoms and signs like acute abdominal pain, nausea, vomiting and if so, to report to their clinicians as soon as possible. If there is any pathological finding during the surgery, the patient should be informed of the same and advised to follow-up with the concerned specialist following delivery. This completes the care plan for an antenatal patient diagnosed and managed laparoscopically for ovarian torsion.

CONCLUSION

Early diagnosis and appropriate surgical management of adnexal torsion is the only way to prevent complications and preserve the pregnancy. Laparoscopic surgery in early pregnancy causes no harm to the fetus and should be encouraged once the diagnosis is confirmed. Minimal handling of the gravid uterus in laparoscopy also plays a role in saving the pregnancy while performing various procedures to deal with ovarian torsion. Delaying the operation may lead to serious infection and jeopardize both the fetus and the mother. Each type of laparoscopic management has its pros and cons. Keeping in mind, clinicians require to be adequately trained in the same to be competent enough to operate in an emergency.

CLINICAL SIGNIFICANCE

Laparoscopic surgery to correct ovarian torsion antenatally has its benefits and risks. The pros of treating ovarian torsion laparoscopically include less intraoperative blood loss, no need for large incisions on the abdomen, small or minimal scar postoperatively, less postoperative pain, shorter hospital stay, quick recovery, and faster return to daily activities. Just like a double-edged sword, laparoscopic management has its disadvantages that any clinician or patient should be aware of. Some of them include failure of entry into the abdomen, inadvertent injury to blood vessels like inferior epigastric artery in the abdominal wall while introducing the trocars through lateral ports, or injury to major abdominal vessels like aorta causing hemorrhage and blood transfusion, injury to organs like bowel and the probable need to convert to laparotomy. Hence, clinicians should be well acquainted with a prompt diagnosis of the condition, timely intervention, keeping in mind the risks associated with the procedure.

REFERENCES

- Huang C, Hong MK, Ding DC. A review of ovary torsion. *Ci Ji Yi Xue Za Zhi* 2017;29:143–147.
- Yuk JS, Shin JY, Park WI, et al. Association between pregnancy and adnexal torsion: a population-based, matched case-control study. *Medicine (Baltimore)* 2016;95(24):e3861. DOI: 10.1097/MD.0000000000003861.
- Hibbard LT. Adnexal torsion. *Am J Obstet Gynecol* 1985;152(4):456–461. DOI: 10.1016/S0002-9378(85)80157-5.

- Chang HC, Bhatt S, Dogra VS. Pearls and pitfalls in diagnosis of ovarian torsion. *Radiographics* 2008;28(5):1355–1368. DOI: 10.1148/rg.285075130.
- Koo YJ, Park JY, Kim DY, et al. Laparoscopic versus open surgery for adnexal tumor in pregnant women. *Gynecol Minim Invasive Ther* 2013;2(2):57–60. DOI: 10.1016/j.gmit.2013.02.002.
- Oelsner G, Cohen SB, Soriano D, et al. Minimal surgery for the twisted ischaemic adnexa can preserve ovarian function. *Hum Reprod* 2003;18(12):2599–2602. DOI: 10.1093/humrep/deg498.
- Ding D-C, Chang Y-H. Laparoendoscopic single-site surgical cystectomy of a twisted ovarian dermoid cyst during early pregnancy: a case report and literature review. *Gynecology and Minimally Invasive Therapy*. 2016;5:173–177.
- Scheib SA, Jones HH, Boruta DM, et al. Laparoendoscopic single-site surgery for management of adnexal masses in pregnancy: case series. *J Minim Invasive Gynecol* 2013;20(5):701–707. DOI: 10.1016/j.jmig.2013.02.024.
- Lowry PS, Moon TD, D'Alessandro A, et al. Symptomatic port-site hernia associated with a non-bladed trocar after laparoscopic live-donor nephrectomy. *J Endourol* 2003;17(7):493–494. DOI: 10.1089/089277903769013649.
- Munshi S, Patel A, Banker M, et al. Spontaneous OHSS with bilateral ovarian torsion. *J Human Reproduct Sci* 2014;7(1):66–68. DOI: 10.4103/0974-1208.130870.
- Tamer A. Hosny, oophoropexy for ovarian torsion: a new easier technique. *Gynecolog Surg* 2017;14(1):7. DOI: 10.1186/s10397-017-1001-9.
- Weitzman VN, DiLuigi AJ, Maier DB, et al. Prevention of recurrent adnexal torsion. *J Fertil Steril* 2008;90(5):2018.e1-3. DOI: 10.1016/j.fertnstert.2008.02.144.
- Daykan Y, Bogin R, Sharvit M, et al. Adnexal torsion during pregnancy – pregnancy outcomes after surgical intervention: a retrospective case-control study. *J Minim Invas Gynecol* 2019;26(1):117–121. DOI: 10.1016/j.jmig.2018.04.015.
- Tsai H-C. Acute abdomen in early pregnancy due to ovarian torsion following successful in vitro fertilization treatment. *Taiwan J Obstet Gynecol* 2015;54:438–441.
- Kanayama S. Laparoscopic detorsion of the ovary in ovarian hyperstimulation syndrome during the sixth week of gestation: A case report and review. *Int J Surg Case Rep* 2019;59:50–53. DOI: 10.1016/j.ijscr.2019.04.051.
- Aydin T, Yucel B. Laparoscopic management of adnexal torsion in a twin, *in vitro* fertilization pregnancy at 23 weeks. *Videosurgery Miniinv* 2014;9(4):655–657. DOI: 10.5114/wiitm.2014.45732.
- Young R, Cork K. Intermittent ovarian torsion in pregnancy. *Clin Pract Cases Emerg Med* 2017;1(2):108–110. DOI: 10.5811/cpcem.2016.12.32932.
- Takeda A, Hayashi S, Imoto S, et al. Pregnancy outcomes after emergent laparoscopic surgery for acute adnexal disorders at less than 10 weeks of gestation. *J Obstet Gynaecol Res* 2014(5):1–7. DOI: 10.1111/jog.12332.
- Vural F, Vural B, Çakıroğlu Y. A case of adnexial torsion during pregnancy: shortcomings in Doppler ultrasonography. *Causapedia* 2015;4:978.
- Resapu P, Gundabattula SR, Bayyrapu VB, et al. Adnexal torsion in symptomatic women: a single-centre retrospective study of diagnosis and management. *J Obstet Gynaecol* 2019;39(3):349–354. DOI: 10.1080/01443615.2018.1494702.
- Mage G, Canis M, Manhes H, et al. Laparoscopic management of adnexal torsion, a review of 35 cases. *J Reprod Med* 1989;34:520–524.