



Laparoscopic Management of Ovarian Cysts

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66.1 Introduction

Ovarian cysts can be diagnosed in the fetal period, most of them in the third trimester of pregnancy. The incidence of presentation is of 1:2500 at referral centers. Three to five percent of children have small incidental ovarian cysts detected on ultrasound (US) [1]. It can be detected from the fetal period until adolescence. It is considered a pathological cyst when it has a diameter greater than 2 cm. However, it does not have the same meaning at one age or another. In neonates the pathological diagnoses usually are follicular cysts, intrauterine torsions, and, exceptionally, teratomas. In older girls, they are usually follicular cysts whose transcendence depends on the acquired size. When the cyst is accompanied by a solid component, we should suspect malignancy (teratomas or stromal tumors). In prepubertal girls with an ovarian mass or cyst, they should be operated if they are symptomatic or have poorly defined radiological signs. In adolescents, ovarian cysts must be related to the clinical history of menstruation and their sexual relations (Fig. 66.1).

The indication for laparoscopy will be made for patients with symptoms of abdominal pain, when there is a presence of a cyst greater than 5 cm in diameter, or when a tumor is suspected.

In neonates, laparoscopy is performed if the cyst does not regress or is complicated (it is not a simple follicular cyst). Conservative surgery of the ovary should be performed whenever possible, except in cases of malignancy. Even with the suspicion of ovarian torsion, surgery must be conservative with detorsion and not with excision, and the cyst can be removed.

In this chapter we describe the laparoscopic treatment of ovarian conservative surgery, either by fenestration or by enucleation of the cyst (cystectomy).

66.2 Preoperative Preparation

Parents of patients and older girls should be informed of the effects of laparoscopy and intervention. They must sign the written informed consent. In all patients a non-cuffed bladder catheter should be placed just after being anesthetized to properly observe the minor pelvis. Antibiotic prophylaxis is not used unless there is suspicion of infection or ovarian torsion. A blood sample will be taken for tumor markers when we suspect malignancy (alpha-fetoprotein, human chorionic gonadotropin).

66.2.1 Positioning

The patient is placed in the supine position. In the case of neonates and infants, the patient is placed

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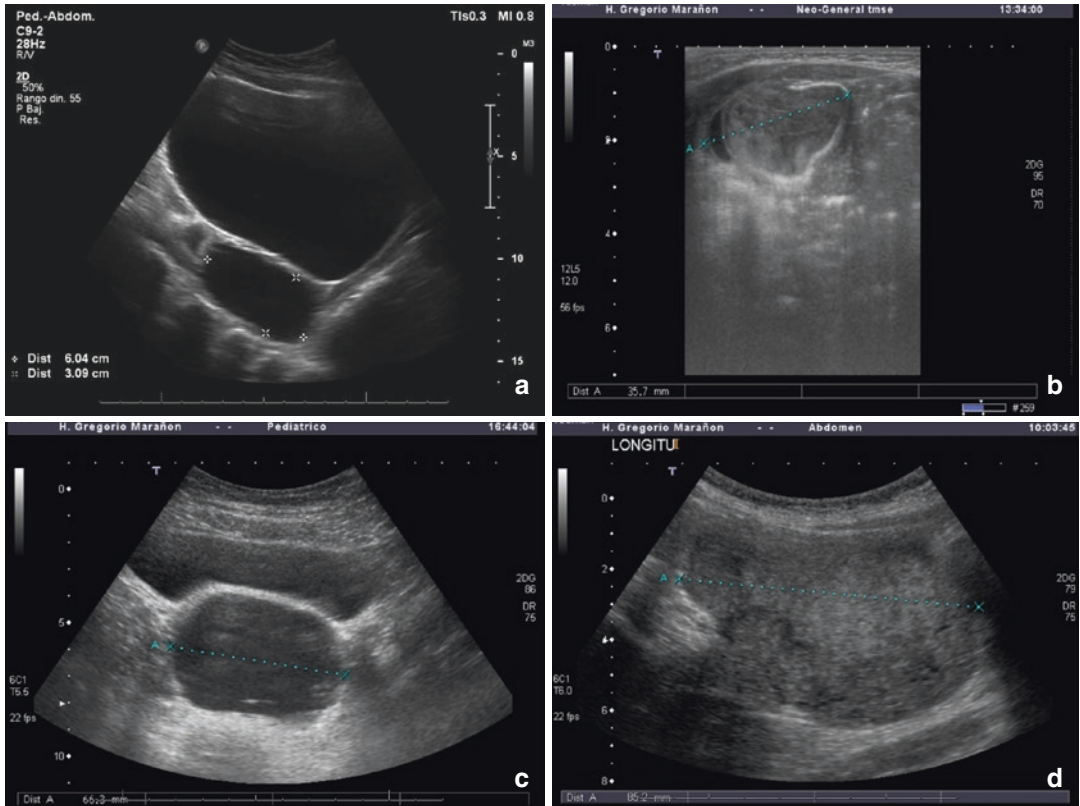


Fig. 66.1 Ultrasonographic images of ovarian cystic and solid lesions. (a) Simple cyst. (b) Complicated cyst. (c) Cystic teratoma. (d) Solid tumor

crosswise to the operating table and the surgeon at the head of it. In older girls and adolescents, the surgeon will be placed to the left of the patient and the assistant to the right. The monitor should be placed at the patient’s feet. The operation will begin with the introduction of the optic by the navel with a trans- or infraumbilical incision with an open technique. The working ports will be placed on both sides of this trocar and in the same plane just to the sides of the lateral edge of the rectus abdominis muscles. In neonates the first trocar can be placed at the epigastrium or at the upper quadrant opposite to the cyst, in order to gain more intra-abdominal working space (Fig. 66.2). One or more trocars are then positioned as needed.



Fig. 66.2 Position of trocars

66.2.2 Instrumentation

It is necessary to have two grasping forceps, a dissector, a monopolar electrode (hook), a scissors,

two needle holders, suction cannula, and extraction bag. If possible, an electronic vascular sealing device greatly facilitates hemostasis. The ideal lens should be 30° and a diameter of 5 mm.

A 3 mm lens can be used in neonates. The length of the instruments will vary depending on the size of the patient.

66.2.3 Technique

Controlled pneumoperitoneum is achieved using 2–3 liters per minute of CO₂ flow to reach a mean intra-abdominal pressure of 8–10 mmHg.

66.2.3.1 Fenestration

In cases of simple (follicular) cysts, the cyst can be partially emptied by aspiration puncture from outside and then opening thereof by cutting with scissors or a bipolar tissue sealing device. Hemostasis will be done by applying the energy of the monopolar scalpel to the scissors electrode.

It will be left open to prevent re-accumulation of liquid inside (Fig. 66.3a, b).

66.2.3.2 Cystectomy

Cystectomy is performed by incising the ovary on its antimesenteric border. The hook can be used for initial incision delimitation. Blunt dissection separates the cyst wall from the ovarian capsule using gentle traction by two graspers, and the cyst will be removed in one piece. Suture of the capsule could be used to control hemostasis, but in absence of bleeding, it could be left open. With this technique the ovarian tissue contained in the capsule is preserved (Fig. 66.4a, b).

Benign cystic teratoma can be also managed by enucleating the mass leaving the normal ovarian parenchyma in the capsule.

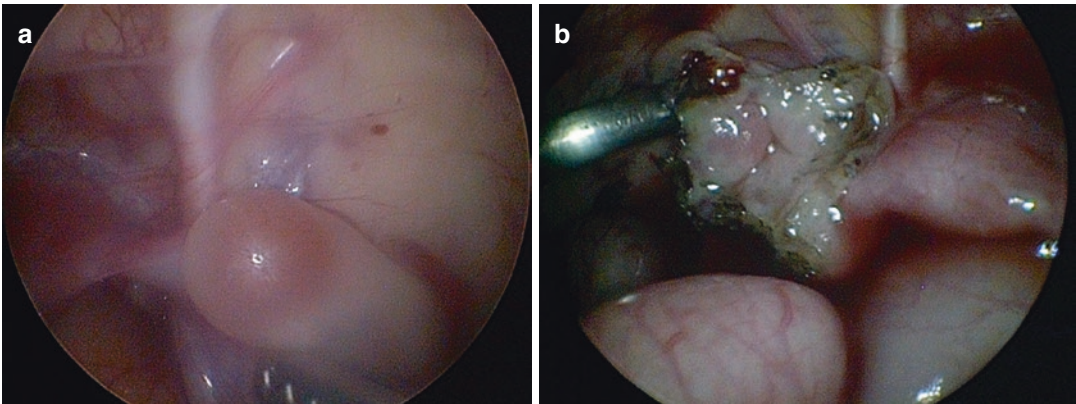


Fig. 66.3 (a) Simple ovarian cyst. (b) Ovarian cyst opened (fenestration)

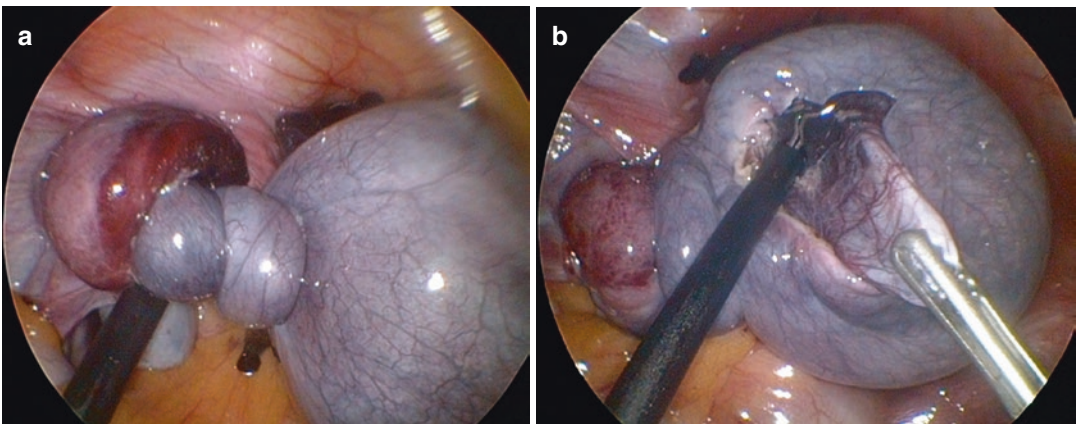


Fig. 66.4 (a) Torsion of ovarian cyst. (b) Opening ovarian capsule after detorsion and cyst wall traction and removal (striping)

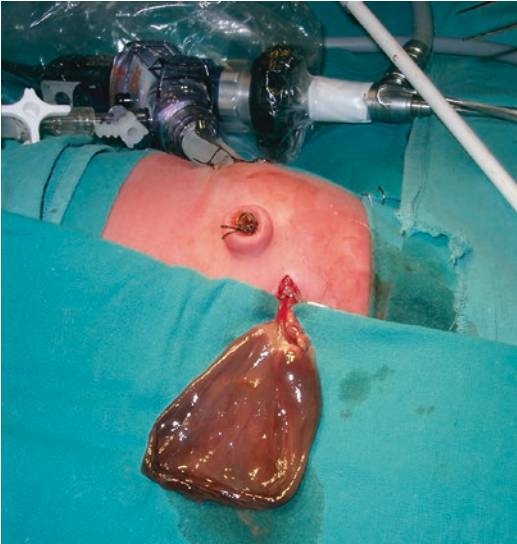


Fig. 66.5 Ovarian necrotic torsion in neonate

66.2.3.3 Oophorectomy

When malignancy is suspected, oophorectomy and tissue lymphatic sampling are performed. Many surgeons suggest to convert to open operation for proper periaortic lymphatic sampling technique. In this case sub-umbilical midline incision is recommended. Oophorectomy is also done in neonatal completely necrotic ovarian torsion (Fig. 66.5).

66.3 Postoperative Care

Postoperative pain can be reduced using low intra-abdominal pressure and local anesthetic infiltration of ports. Nonsteroidal anti-inflammatory drugs (paracetamol, metamizol) can be administered every 6 h for the first 24–48 h. Oral feeding can be initiated after the patient is fully awakened and advanced it accordingly. Shower can be allowed after 48 h after surgery, and wound dressing is changed after it. Patient can be discharged on the first or second postoperative day if asymptomatic.

66.4 Results

Ultrasonographic follow-up studies have shown ovarian anatomy recovery and preservation of follicular tissue after fenestration or cystectomy.

66.5 Discussion

In a multicenter retrospective study, Tyraskis et al. showed that prenatally diagnosed simple cysts resolved in 32% of cases, while 38% resolved postnatally. Fourteen percent underwent surgery postnatally, and 16% had torsion of the ovary. The torsion rate increased with size from 0% in cysts <20 mm to 33% in cysts >50 mm. In between 0 and 40 mm, there is a higher rate of spontaneous resolution, and the median time to postnatal resolution was 10 (5–27) weeks in those treated conservatively [2]. Other publications suggest a similar pattern of spontaneous resolution [3]. So, it is recommended a conservative approach and postnatal ultrasound monitoring. Those cysts which exceed 5 cm and do not shrink postnatally may require surgical treatment [4].

Complex ovarian cysts lead to problems even after regression in the postnatal period and require operative intervention sooner or later. In a series of 38 patients, Karakuş et al. found that three out of seven complex ovarian cysts that initially regressed presented with intestinal obstruction, and oophorectomy plus adhesiolysis had to be performed. In another series, surgical treatment was required in 7 out of 11 (64%) complex ovarian cysts [5].

In prepubertal girls, visualization of ovarian follicles is perfectly physiological, as the diameter does not exceed 10 mm. Ovarian cysts are well defined for fluid images of >20 mm. If asymptomatic they are usually discovered incidentally by ultrasound. The natural history of functional cysts is eventually regression; persistence is suggestive of malignancy. The onset of pain is a sign of complication, and abrupt pain with vomiting is a sign of torsion [6].

Bolli et al. explore a predictive score of torsion complication. They found that the presence of vomiting, short duration of abdominal pain, and elevated C-reactive protein level have a predictive value for the diagnosis of ovarian torsion in girls between 2 and 12 years old [7].

If operative intervention is necessary, ovary-preserving techniques should be utilized as describe in this chapter. Precocious pseudopuberty in girls is associated to an autonomous

ovarian cyst or in patients with McCune-Albright syndrome and occurs as a result of estrogen production. These patients have suppressed LHRH testing and have simple ovarian cysts producing estradiol. Current management involves surgery (cystectomy) and endocrinological therapy (pharmacological suppression) [8].

Papic's group found, by histopathology, viable ovarian tissue in all three oophorectomies performed. Also, postnatal torsion occurred in 1/25 observation patients (4%) or in 1/8 (13%) with cysts ≥ 50 mm [9]. So, stripping of benign ovarian cysts has been reported to be preferable to cyst wall ablation. It is shown that no ovarian tissue is removed together with the cyst if the cyst is non-endometriotic [10].

Finally, in a big series of adolescents and young adults, there were only 4 malignant cysts (1.4%). Cystectomy was performed in 205 cases (72.7%), fenestration of cyst wall was performed in 53 cases (18.8%), and aspiration was applied in 22 cases (7.8%). The types of operation were not significantly different among adolescents and young adults ($P > 0.05$) [11].

In summary, prenatally simple cysts can be managed expectantly, as complicated cysts have to be operated. In older girls, cyst greater than 5 mm in diameter has a great chance of torsion, and laparoscopy is indicated. Conservative surgery can be done in majority of cases, by fenestration, cystectomy or even simple aspiration.

References

1. Millar DM, Blake JM, Stringer DA, et al. Prepubertal ovarian cyst formation: 5 years' experience. *Obstet Gynecol.* 1993;81:434–7.
2. Tyraskis A, Bakalis S, Scala C, Syngelaki A, Giuliani S, Davenport M, David AL, Nicolaidis K, Eaton S, De Coppi P. A retrospective multicenter study of the natural history of fetal ovarian cysts. *J Pediatr Surg.* 2018;53(10):2019–22. pii: S0022-3468(18)30103-9. <https://doi.org/10.1016/j.jpedsurg.2018.02.049>.
3. González N, Ruiz de Temiño M, Riazuelo G, Elías J, Esteban JA. Prenatal ultrasound in the diagnose of ovarian cysts. *Cir Pediatr.* 1999;12:22–5.
4. Moreno R, Savirón R, Corona C, LermA D, Corbacho T. Diagnóstico prenatal de 10 quistes de ovario fetal: manejo postnatal. *Rev Chil Obstet Ginecol.* 2013;78(1):19–25.
5. Karakuş OZ, Ateş O, Hakgüder G, Olguner M, Akgür FM. Complex fetal ovarian cysts cause problems even after regression. *Eur J Pediatr Surg.* 2014;24(4):337–40.
6. Pienkowski C, Cartault A, Carfagna L, Ernoult P, Vial J, Lemasson F, Le Mandat A, Galinier P, Tauber M. Ovarian cysts in prepubertal girls. *Endocr Dev.* 2012;22:101–11.
7. Bolli P, Schädelin S, Holland-Cunz S, Zimmermann P. Ovarian torsion in children: development of a predictive score. *Medicine (Baltimore).* 2017;96(43):e8299.
8. Papanikolaou A, Michala L. Autonomous ovarian cysts in prepubertal girls. How aggressive should we be? A review of the literature. *J Pediatr Adolesc Gynecol.* 2015;28(5):292–6.
9. Papic JC, Billmire DF, Rescorla FJ, Finnell SM, Leys CM. Management of neonatal ovarian cysts and its effect on ovarian preservation. *J Pediatr Surg.* 2014;49(6):990–3; discussion 993–4.
10. Palmara V, Sturlese E, Romeo C, Arena F, De Dominici R, Villari D, Impellizzeri P, Santoro G. Morphological study of the residual ovarian tissue removed by laparoscopy or laparotomy in adolescents with benign ovarian cysts. *J Pediatr Surg.* 2012;47(3):577–80.
11. Seckin B, Ozdener T, Tapisiz OL, Batioğlu S. Laparoscopic treatment of ovarian cysts in adolescents and young adults. *J Pediatr Adolesc Gynecol.* 2011;24(5):300–3.