



Laparoscopic Assisted Management of Neonatal Ovarian Cysts

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Abstract

Aim: Aim of our study is to evaluate the feasibility and outcomes of laparoscopic management of neonatal ovarian cyst.

Materials & Methods: Retrospective analysis of 12 baby girls with ovarian cysts who had been treated by laparoscopic assisted procedure in the period from 2011 to 2016 was done. All ovarian cysts were diagnosed prenatally. Variables analyzed were Sonographic findings, intra operative findings, intra operative time, blood loss and histo-pathological examination report. Follow up was done with ultrasonography at 1 and 6 month interval

Results: All patients were successfully treated with laparoscopy without conversion to open surgery. Ovary was preserved in 9 cases. In two patients, ovary was detached from the tubes and found to be lying free in the peritoneal cavity, and in one patient it was necrosed and adherent to the liver. Mean weight of the babies was 2.9 kg, mean cyst diameter was 7.1 cm, mean intra-operative time was 44 min, and the average blood loss was 4 ml. Two cases had drain placement. All babies were started on feeds on same day and discharged on 2nd post-operative day except one newborn who had prolonged ileus. No intra operative complications encountered.

Conclusion: Laparoscopic management of ovarian cysts is safe and feasible in neonatal age group provided we have adequate expertise, infrastructure and anesthetic support.

Keywords: Neonatal; Ovarian cysts; Laparoscopy

Introduction

Before the Ultrasound era, neonatal ovarian cyst was considered to be a rare pathology. The various cystic ovarian lesions are follicular cyst, corpus luteal cyst, cyst adenoma, cystic teratoma and cystadeno carcinoma among which the most common newborn ovarian pathology is follicular cyst. Valenti had detected the first prenatal ovarian cyst [1], with the use of routine antenatal ultrasound screening; neonatal ovarian cysts are increasingly being diagnosed. Generally, simple cysts less than 5 cm resolve spontaneously. Complex cysts and simple cysts larger than 5 cm require surgical intervention. We share our experience, feasibility and

outcomes of Laparoscopic management of neonatal ovarian cyst.

Materials & Methods

This study is a retrospective analysis of 12 newborns who were treated laparoscopically for ovarian cysts during the period 2011-2016. All ovarian cysts were diagnosed prenatally and followed up with postnatal ultrasound.

Inclusion Criteria

1. Babies less than 28 days of age who were diagnosed to

- have ovarian cyst
- Simple cyst with size more than 5cm
 - Complex cyst

Exclusion Criteria

- Babies who presented with ovarian cyst beyond the newborn period.
- Newborns who underwent open surgical procedure
- Newborns, whose parents were not willing for surgical procedure during the neonatal period.

Surgical Procedure

Under general anesthesia, patient in supine position, 5 mm port for camera in supra umbilical region, far away from the cyst margin and two 3mm lateral ports for instrumentation were inserted. Carbon dioxide was maintained at 6-8mmHg. Flow rate was kept at 1-2 liters. Cyst was visualized and decompressed by aspirating all the contents using needle aspirator, in cases of torsion, detorsion was done before aspiration of the cyst. Exteriorization of cyst was done (Figure 1). Cystectomy followed by over-running of oozing ovarian edges was done (Figure 2). In cases of auto amputations, removal of auto amputated cyst was done. Once procedure is completed, hemostasis is ensured, pneumo- peritoneum reversed and ports were closed using 4-0 vicryl.



Figure 1: Exteriorization of the ovarian cyst through the umbilical port.



Figure 2: Over-running of edges of ovary after cyst removal.

Results

Twenty-eight babies were diagnosed with ovarian cyst antenatally during the same period, out of which 12 baby girls underwent surgical intervention. 8 babies had simple cyst more than 5 cm and 4 babies had complex cysts. Demographics of these babies are listed in a table below (Table 1). 7 patients underwent preservation of ovaries, laparoscopic cystectomy with over-running of edges, two patients with torsion underwent laparoscopic detorsion, preservation of ovaries and cystectomy with over-running of the edges. In three patients ovarian units were lost due to torsion and auto amputation.

The average birth weight of babies was 2.9kg, mean cyst diameter was 7.1cm, and mean intra operative time was 44min; average blood loss was 4ml. Drain was placed in two patients, in one case due necrosed ovary being stuck to the liver and in another patient ovary was densely adherent to sigmoid colon. There were no intra operative complications and no conversion to open encountered. All the newborns were started on direct breast feeds on postoperative day 1 and discharged on day 3 expect one baby who had a prolonged ileus due to spillage of necrotic fluid. All newborns had a speedy recovery and excellent cosmesis.

S.no	Birth weight	Type	Size	Side	Day of life	Intra operative findings	Procedure	Intra operative time	Blood loss
	(Kg)		(cm)	(R/L)				(Min)	(ml)
1	3.2	Simple	6.5	R	2	Clear cyst	Cystectomy	65	3
2	2.8	Simple	10.5	R	2	Torsion	Detorsion with cystectomy	58	6
3	2.5	Complex	4.5	R	2	Auto	Oophorectomy	50	4
						Amputated			

4	2.4	Simple	5.5	L	3	Clear cyst	Cystectomy	35	3
5	3.5	Complex	4	L	3	Torsion / necrosis, attached to liver	Oophorectomy	45	5
6	2.5	Simple	6.8	R	2	Clear cyst	Cystectomy	36	5
7	3.6	Complex	8.5	R	5	Torsion	Detorsion with cystectomy	48	2
8	2.6	Complex	4.8	L	3	Cyst with brown, turbid fluid	Cystectomy	35	8
9	3	Simple	7.5	R	2	Auto Amputated	Oophorectomy	38	5
10	2.7	Simple	8.2	L	3	Clear cyst	Cystectomy	38	2
11	2.7	Simple	9	R	5	Clear cyst	Cystectomy	40	2
12	3.3	Simple	9.4	R	4	Clear cyst	Cystectomy	40	3

Table 1: Demography of patients.

Histopathological examination revealed that 8 cases were benign serous cyst; one case was hemorrhagic cyst and three cases showed cyst with extensive necrosis of ovarian stroma (Table 2) Patients were followed up with ultrasound abdomen at 3rd month and 6th month. 7 cases with simple cysts and one case of complex cyst, on follow up ultrasound showed ovaries with follicles and good blood supply. One patient with torsion of complex ovarian cyst, where the ovary was detorsed and preserved was not visible at subsequent sonography.

Number of cases	Histopathology report
6	Benign serous cyst
2	Benign serous cyst with areas of hemorrhage & Infarction
3	Ovarian stroma with infarction and extensive necrosis
1	Hemorrhagic cyst

Table 2: Histo-pathological finding of the cases.

Discussion

Neonatal ovarian cysts occur due to the influence of maternal hormones, and they are classified into simple (completely anechoic) and complex (characterized by fluid-debris, clot, septations, and echogenic wall). Most of the simple cysts less than 5 cm tend to regress spontaneously and they are inert. On the other hand larger cysts and complex cysts require surgical intervention and they tend to develop complications

[2]. Torsion with loss of ovarian units, compression on adjacent organs, sudden rupture of the cyst, and spontaneous hemorrhage into the cyst are the complications of the ovarian cyst. Malignant transformation is an exceedingly rare complication, which is thought to arise in complex cyst [3]. Varied treatment options are available like simple observation of cyst, ultrasound guided needle aspiration of cyst, conventional laparotomy and laparoscopic management of ovarian cyst. Laparoscopic removal of a neonatal ovarian cyst was first described in detail in 1995 [4].

In our series 12 baby girls underwent laparoscopic management for neonatal ovarian cysts, out of which 8 babies had simple cyst larger than 5 cm and 4 babies had complex cyst. Cho, et al. in their retrospective study reviewed 21 neonates in which 8 babies had simple cyst and 13 babies had complex cyst [5]. Our neonates underwent laparoscopic management within the first week of life. All of them were unilateral cyst and asymptomatic, even the largest cyst did not produce any respiratory distress or compression symptoms. Right-sided ovarian pathologies were common (8cases) which is similar to other series [6-8].

Torsion being the most common complication, we encountered ovarian torsion in three neonates in which detorsion and cystectomy was done in two cases, unfortunately in one neonate the ovary was found to be torsed, necrosed auto amputated and attached to the liver [6]. shared their experience in management of complex newborn ovarian cyst, he revealed that out of 14 newborns operated over a period of 6 yrs, 4 patients had torsion of ovary and underwent oophorectomy [6]. Auto amputation

and free floating of ovarian cyst into peritoneal cavity was found to be there in two newborns in our series, similar to the report by Ladenhauf, et al. who also managed both the cases successfully by laparoscopy [9].

Mean operative time in our series was 44 minutes which was comparable to Pujar, et al. and Esposito, et al. who had average operative time of 34 and 40 minutes respectively [8,10]. In our series 8 patients had simple ovarian cyst and ovary was preserved in seven cases. Ovarian unit was lost in one patient with simple cyst due to auto amputation. A retrospective study in 2014 revealed that 9 newborns with simple ovarian cyst larger than 5 cm were managed laparoscopically and there were no loss of ovarian tissue [10]. Histopathological examination revealed benign serous cyst in 8 cases, hemorrhagic cyst in 1 case and cyst with extensive necrosis of ovarian stroma in 3 cases. Manjiri, et al. in their study revealed 7 cases of hemorrhagic cyst with calcification and necrosis, 2 cases of serous cyst adenoma with hemorrhage, 1 case of simple serous cyst and one case of serous cyst with necrosis [6].

The remaining 16 newborns were conservatively managed and close follow up with sonogram was done, among which 4 babies had increase in size of the cyst (more than 5 cm) at 3rd month follow up and underwent laparoscopic cystectomy. At 6 month follow up, 3 more babies had sonographic findings of progression in the cyst size beyond 5 cm, out of which one child presented with abdominal distension. All of them underwent laparoscopic intervention. The remaining nine babies in our series found to have spontaneous regression of the cyst during their follow up which ranged from 24 to 48 months whereas in Zampieri, et al. series 33 cases were managed conservatively and found to have spontaneous regression in all the cases within 6 month follow up [11].

Oophorectomy can lead to low ovarian reserve, hormonal imbalance and sub-optimal fertility hence we recommend early intervention to prevent the loss of ovarian tissue. Laparoscopy in a neonate is ergonomically challenging due to lack of intra-abdominal space, inability to raise the pressures beyond 8 mmHg and non-availability of miniature instruments in many centers. Anesthesia for neonatal laparoscopy is tricky due to risk of hypercapnia. When all these challenges are surmounted, it gives the patient advantages of minimal morbidity, speedy recovery and excellent cosmesis.

Conclusion

Surgical guidelines for management of neonatal ovarian cysts are well established. We would like to conclude

that laparoscopic assisted management of ovarian cyst is safe and feasible with minimal morbidity in neonatal age group provided we have adequate expertise, infrastructure (neonatal intensive care) and anesthetic support.

References

1. Valenti C, Kassner EG (1975) Yermakov V Antenatal diagnosis of a fetal ovarian cyst. *Am J Obstet Gynecol* 123(2): 216-219.
2. Brandt ML, Luks FI, Filiatrault D, Garel L, Desjardins JG, et al. (1991) Surgical indications in antenatally diagnosed ovarian cysts. *J Pediatr Surg* 26(3): 276-281.
3. Oak SN, Parelkar SV, Akhtar T, Pathak R, Vishwanath N, et al. (2005) Laparoscopic management of neonatal ovarian cysts Department of Paediatric Surgery. *J Indian Assoc Pediatr Surg* 10(2): 100-102.
4. Vander Zee DC, Van Seumeren IG, Bax KM, Rovekamp MH, Ter Gunne AJ (1995) Laparoscopic approach to surgical management of ovarian cyst in the newborn. *J Pediatr Surg* 30(1): 42-43.
5. Cho MJ, Kim DY, Kim SC (2015) Ovarian Cyst Aspiration in the Neonate: Minimally Invasive Surgery. *J Pediatr Adolesc Gynecol* 28(5): 348-353.
6. Manjiri S, Padmalatha SK, Shetty J (2017) Management of Complex Ovarian Cysts in Newborns - Our Experience. *J Neonatal Surg* 6(1): 3.
7. Esposito C, Garipoli V, Di Matteo G, De Pasquale M (1998) Laparoscopic management of ovarian cysts in newborns. *Surg Endosc* 12(9): 1152-1154.
8. Akın MA, Akın L, Ozbek S, Tireli G, Kavuncuoglu S, et al. (2010) Fetal-neonatal ovarian cysts-their monitoring and management: retrospective evaluation of 20 cases and review of the literature. *J Clin Res Pediatr Endocrinol* 2(1): 28-33.
9. Ladenhauf HN, Brandtner MG, Ardelean MA, Schimke C, Metzger R (2017) Laparoscopic management of autoamputated ovary in newborns: A report of 2 cases. *J Minim Invasive Gynaecol* 24(5): 859-862.
10. Pujar VC, Joshi SS, Pujar YV, Dhumale HA (2014) Role of laparoscopy in the management of neonatal ovarian cysts. *J Neonatal Surg* 3(2): 16.
11. Zampieri N, Borutto F, Zamboni C, Camogilo FS (2008) Foetal and neonatal ovarian cysts: a 5-year experience. *Arch Gynecol Obstet* 277(4): 303-306.