

Surgical Indications for Neonatal Ovarian Cysts

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MIZUNO, M., KATO, T., HEBIGUCHI, T. & YOSHINO, H. *Surgical Indications for Neonatal Ovarian Cysts*. Tohoku J. Exp. Med., 1998, 186 (1), 27-32 — Ante- or neonatal ovarian cysts can be often diagnosed by routine ultrasonography. Small simple ovarian cysts, which can be followed with serial ultrasonography, usually resolve spontaneously. Large simple cysts and complicated cysts should undergo surgical treatment to reduce the potential for serious complications. Seventeen ovarian cysts were experienced between 1983 and 1997. Sixteen cases underwent surgical treatment at less than 1 month of age according to our protocols. In this report, we reviewed these cases for clinical presentation, ultrasound data, management, intraoperative findings, complications, and outcome. At operation, nine of them showed torsion, and seven of them showed necrotic changes. Only five of them was considered to fall into torsion by preoperative ultrasonography. In five cases whose blood flow could not improve after reduction of torsion, salpingo-oophorectomy was performed. We consider that small simple ovarian cysts under 4 cm in diameter can be observed carefully with serial ultrasonography. But, not only complicated ovarian cysts and simple cysts over 5 cm in diameter, but smaller cysts showing no decrease in size should be considered for surgical indication to rescue the ovarian tissue. ——— ovarian cyst; torsion; neonate; surgical indication © 1998 Tohoku University Medical Press

Ovarian cysts are diagnosed ante- and neonatally using routine ultrasonography. In case of multiple ovarian cysts that contain solid components, teratoma should be suspected. On the other hand, small simple ovarian cysts are considered to be benign cysts caused by maternal hormonal stimulation that should be followed with serial ultrasonography and usually resolve spontaneously (Avni et al. 1983; Ikeda et al. 1988; Mckeever and Andrews 1988; Nussbaum et al. 1988; Zachariou et al. 1989; Brandt et al. 1991). On the contrary large and/or complicated cysts require surgical treatment (Avni et al. 1983; Alrabeeah et al. 1988; Brandt et al. 1991). Seventeen cases of neonatal ovarian cysts were examined between 1986 and 1997. Sixteen patients underwent surgical treatment according

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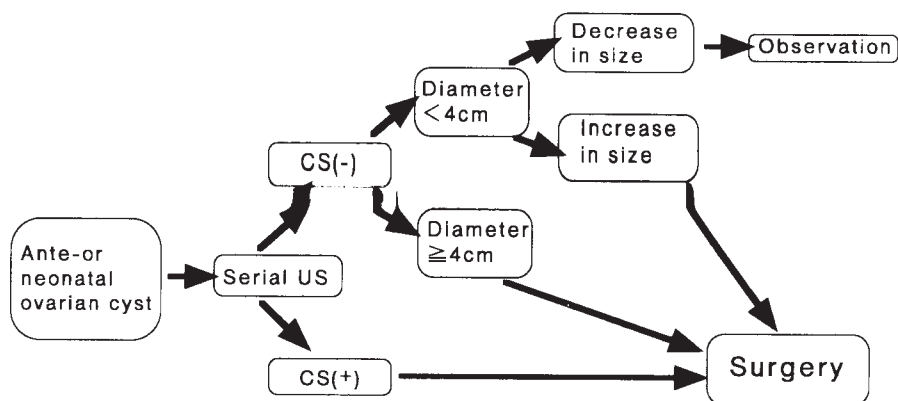


Fig. 1. US, ultrasonography; CS, complicated signs (debris and/or septum).

to our therapeutic protocols. The 17 cases of ovarian cysts diagnosed ante- or neonatally are reported and our therapeutic protocols are discussed.

MATERIALS AND METHODS

The subjects were 17 newborns with ovarian cysts. Sixteen of the newborns underwent surgical treatment within 1 month after birth according to our therapeutic protocol. The protocol was as follows: 1) simple cysts less than 4 cm in diameter were monitored with serial ultrasonography, 2) cysts over 5 cm in diameter were associated with a high risk of torsion and were extirpated, 3) complicated cysts referred to those in which torsion was observed and were extirpated. A complicated cyst is characterized by the following ultrasonographic findings: The presence of debris or septum in the cyst, suggesting that the cyst is becoming necrotic and increases in size over a series of ultrasound examinations, suggesting ovarian venous or lymphatic obstruction due to torsion of the cyst. Enucleation of the cyst was the first surgical choice to preserve normal ovarian tissue as much as possible. However salpingo-oophorectomy was necessary in cases of ovarian necrosis caused by torsion.

RESULTS

Seventeen patients were ante- or neonatally diagnosed between 1986 and 1997 as having ovarian cysts. Fifteen cases were diagnosed during routine antenatal ultrasound examinations from the 30th to the 37th gestational week.

The remaining 2 cases were postnatally diagnosed due to abdominal masses and distension. All patients were born at the normal gestational week and were healthy. No additional anomalies were found in any patient (Table 1).

Serial ultrasonography showed spontaneous reduction of the ovarian cyst in 1 case diagnosed antenatally a few days after birth and disappeared within 2 weeks. The remaining 16 patients required surgery. All 16 patients demonstrated abdominal masses and distension at birth. Two patients exhibited bilious vomiting. The size of the cysts at diagnosis ranged from 23–100 mm in diameter (Table 2). Four of the 17 patients revealed the ultrasonographic complicated

TABLE 1. *Case presentation*

Patients No.	Time of diagnosis	Gestational term (GW)	Birth weight (g)	Symptoms
1.	1D	38	3788	Abm
2.	7D	40	2680	Abm
3.	36GW	39	3666	Abm
4.	34GW	40	3296	Abm
5.	35GW	40	2778	Abm
6.	37GW	38	3240	Abm
7.	35GW	41	2518	Abm
8.	35GW	37	2938	Abm
9.	33GW	40	2982	Abm, vomiting
10.	34GW	37	2846	Abm
11.	33GW	38	3340	Abm, vomiting
12.	36GW	39	3332	Abm
13.	33GW	39	3048	Abm
14.	30GW	38	2908	Abm
15.	35GW	40	3444	Abm
16.	35GW	40	3114	Abm
17.	32GW	40	3450	None

Abm, Abdominal mass; D, day after birth; GW, gestational week.

TABLE 2. *Preoperative ultrasonographic findings*

Patients No.	Diameter of cyst (mm)	Intracystic debris	Intracystic septum	Changes of size
1.	100	—	—	UC
2.	50	—	—	UC
3.	77	—	—	Increased
4.	45	—	—	UC
5.	50	—	—	UC
6.	44	—	—	UC
7.	35	—	—	UC
8.	50	—	—	UC
9.	40	+	—	UC
10.	70	—	—	Increased
11.	43	+	—	UC
12.	70	—	—	UC
13.	50	+	+	UC
14.	28	+	—	UC
15.	60	—	—	UC
16.	40	—	—	UC
17.	23	—	—	Decreased

UC, unchanged.

TABLE 3. *Operative findings*

Patients No.	Age at operation (Days)	Diameter of cyst (mm)	Torsion	Necrosis	Surgery
1.	9	115	—	—	E
2.	16	60	—	—	E
3.	6	100	—	—	E
4.	14	45	+	—	E
5.	12	60	+	+	S-O
6.	14	40	+	—	E
7.	14	35	+	+	S-O
8.	4	50	+	+	E
9.	1	45	+	+	S-O
10.	0	70	—	—	E
11.	0	60	+	+	S-O
12.	10	90	+	+	E
13.	1	50	+	+	S-O
14.	5	25	—	—	M
15.	2	70	—	—	M
16.	9	48	—	—	E

E, Enucleation; S-O, Salpingo-Oophorectomy; M, Marsupialization.

findings. Intracystic debris was observed in 4 patients (No. 9, 11, 13 and 14). The cyst was separated by an internal echo in patient 13. An increase in size was observed by antenatal serial ultrasonography in patients 3 and 11.

Surgical intervention was performed between 1 and 16 days of age (Table 3). Cysts in 9 of the 16 patients revealed torsion, and 7 of the 9 showed necrosis in both the ovary and oviduct. Preoperative ultrasonography identified complicated ovarian cysts in only 5 of the 9 patients. Seven patients with ovarian cysts without torsion and 4 of 9 patients with torsion (No. 4, 6, 8 and 12) whose blood flow improved after reduction received either enucleation or marsupialization of the cyst and ovarian tissue was preserved. Five patients with ovarian necrosis (No. 5, 7, 9, 11 and 13) underwent salpingo-oophorectomy. On histological examination, specimens showed inflammatory or necrotic change and there were no neoplastic findings in any case.

DISCUSSION

Ovarian cysts appear to be the most frequent intraperitoneal cystic lesion in females in the perinatal period. Ante- or neonatal ovarian cysts may be caused by stimulation of maternal estrogen, placental human chorionic gonadotropin (HCG), or fetal follicle stimulating hormone (FSH) to ovarian follicles during the last month of pregnancy. Decreased hormonal stimulation after birth arrests

follicle maturation and most small ovarian cysts begin to disappear soon after birth and are absent within the first few months of life (Ikeda et al. 1988; Brandt et al. 1991; Croitoru et al. 1991).

Routine perinatal ultrasonography has led to increases in the number of cases of ovarian cysts diagnosed. Serial ultrasonography is also available to observe changes in not only size but contents of the cysts, and ultimately to determine the best treatment (Suita et al. 1984; Kirkinen and Jouppila 1985; O'Hagan et al. 1985).

Many authors have advocated that simple cysts under 4 cm in diameter should be followed without surgery, because most will spontaneously resolve and are associated with a low risk of torsion (Kirkinen and Jouppila 1985; Ikeda et al. 1988; McKeever and Andrews 1988; Brandt et al. 1991; Croitoru et al. 1991). Surgery is indicated for cysts with torsion and for cysts larger than 5 cm which demonstrate a greater risk of torsion with subsequent loss of ovarian tissue (Ikeda et al. 1988). Ultrasonographic findings such as intracystic debris or septum suggest severe blockage of blood flow or necrosis of the cyst secondary to torsion. Even surgical intervention fails to rescue the ovary in most patients with these ultrasonographic findings. Rapid increases in size without complicated ultrasonographic findings suggest that torsion may exist but that strangulation has not yet occurred (Avni et al. 1983; Suita et al. 1984). In these cases, early reduction of torsion improves blood flow to the ovary and consequently preserves the ovarian tissue. Grapin et al. (1987) reported a case of torsion associated with an ovarian cyst as small as 2 cm in diameter. We encountered a case of torsion with a cyst 3.5 cm in diameter (No. 7). Our findings suggest that cysts under 4 cm in diameter can exhibit torsion. If the cyst shows no tendency to decrease during serial ultrasonography, surgical intervention should be considered to preserve the ovarian tissue.

As an alternative treatment, percutaneous needle aspiration of intracystic contents under ultrasonographic guidance has been reported (Landrum et al. 1986). In our study, however, some cysts (No. 15 and 16) returned to their previous size a few days following aspiration. No clear advantage to aspiration was observed by either laparoscopic or open surgery. We perform enucleation or marsupialization of the cyst by laparotomy. Laparoscopic or laparoscope assisted surgery may also be possible.

In conclusion, small simple ovarian cysts less than 4 cm in diameter can be carefully observed with serial ultrasonography. However, not only complicated cysts or simple cysts over 5 cm in diameter, but also smaller cysts less than 4 cm in diameter with no tendency to decrease in size should be considered for surgical intervention to avoid damage to the ovarian tissue.

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