Neonatal Intestinal Obstruction and Bowel Ischemia Secondary to Ovarian Cyst

Neonatal ovarian cysts (NOCs) are classified into simple ovarian cysts (SOCs) and complex ovarian cysts (COCs).\(^{[1-4]}\) SOCs are anechoic, thin walled, and unilocular on ultrasound (US). COCs have thick cyst wall, internal septa, and debris. Conservative treatment is advised for NOC smaller than 4–5 cm.\(^{[1-2,4]}\) Infants on conservative management may deteriorate rapidly with the onset of complications.

Intestinal obstruction (IO) has been reported in 3% of NOC.\(^{[1,2,4]}\) In 10 of the 24 patients in the literature with IO secondary to NOC, the IO was caused by the pedicle of the cyst extending from the pelvis to the cyst in the abdomen.\(^{[1,2,4]}\) In our patient reported here, the cause of IO was similar and about 80 cm of the jejunum and ileum were gangrenous. This is the first report of such massive small bowel gangrene caused by NOC.

A full-term baby girl with antenatal finding of an intrabdominal cyst was noted to have a NOC of about 4 cm diameter on postnatal US scan. The cyst in the antenatal scan at 32 weeks, was anechoic, thin walled, and 3–4 cm in diameter. While on conservative management, in the 3\(^{rd}\) week of life, the child presented with hematochezia for 2 days and features of peritonitis. Abdominal skiagram revealed pneumoperitoneum.

At laparotomy, a NOC of about 5 cm size and filled with brownish fluid was found in the upper abdomen. The cyst was adherent to the jejunum [Figure 1]. The jejunum and ileum showed ischemic changes secondary to the “band effect” of a long, thin pedicle extending from the lower pole of the cyst to the upper uterus on the left side [Figures 1 and 2a]. The cyst was released from the jejunum first and then from its pedicle arising from the pelvis [Figure 2a and b]. The left fallopian tube (FT) within the pedicle was atretic.

Release of the cyst attachments improved the blood supply of part of the bowel. Gangrenous jejunum and ileum of nearly 80 cm were resected with the creation of end jejunostomy and distal ileostomy. The residual bowel length consisted of 35 cm of the jejunum and 10 cm of the distal ileum. The right ovary was normal and the left ovary absent in the pelvis. The resected cyst showed necrosis in its wall and ovarian follicles were not identifiable. Six weeks later, intestinal continuity was restored. Total parenteral nutrition was given for 3 months with subsequent gradual reduction of parenteral nutrition and increase to full oral feeds over 16 months. When last seen at the age of 3 years, the child’s weight was within the normal limits.

The diagnosis of ovarian cysts has increased with the use of antenatal and postnatal US scans.\(^{[1-3]}\) Cysts <2 cm in diameter are considered physiological.\(^{[1,3]}\) The management of NOC before the onset of complications remains uncertain.\(^{[1-4]}\) Conservative management is adopted for both SOC and COC, when the cysts show signs of regression in the 1\(^{st}\) year of life.\(^{[1,4]}\) Parental counseling and US monitoring at 1–3 months intervals in the 1\(^{st}\) year and longer intervals over the 2\(^{nd}\) and 3\(^{rd}\) years are recommended.\(^{[1,3,4]}\) Progressive decrease in the cyst size assures successful outcome.

Percutaneous cyst aspiration reduces the cyst size temporarily and chances for torsion but is prone for recurrent enlargement. It has been used both prenatally and...
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and postnatally.\textsuperscript{[1]} Surgical intervention mostly ends in oophorectomy on the side of intervention. Fixation of the contralateral ovary is not routinely done as the factors in the pathogenesis of the common NOC are limited to the intrauterine and perinatal periods. The risk for contralateral torsion or cyst enlargement is negligible if the contralateral ovary is either normal or has only small cysts.

Ovaries and FT descend from high up in the posterior abdominal wall of the developing embryo (gonadal zone) to their eventual pelvic location.\textsuperscript{[1,2,4]} In nearly half of the patients with IO and NOC, (including another case reported from our institution and the current case) the location of the cysts was above the pelvis (in the central or upper abdomen) with the cyst pedicle extending from the pelvis.\textsuperscript{[1,2,4]} The pedicle length depends on the cyst position in the abdomen.\textsuperscript{[1-3]} The pedicles caused IO in these cases by band effect or torsion.\textsuperscript{[1,2,4]} The FT was part of the pedicle and showed changes such as fibrosis, calcification, and stretching.\textsuperscript{[3,4]} Primordial follicles seen normally in sizable numbers in neonatal ovaries were not seen in any of these cysts, pointing to ovarian dysgenesis. However, ovarian dysgenesis may be either a primary defect in development or secondary to torsion and ischemia.\textsuperscript{[4]} Histologically, the cyst pedicles contain vascularized connective tissue resembling embryonic mesenchyme.\textsuperscript{[3]} Torsion can occur both in the prenatal and postnatal periods.\textsuperscript{[1-5]} Torsion may also explain the histological changes seen in the FT.\textsuperscript{[4]}

The frequent location of NOC in the upper abdomen in patients presenting with IO accounts for the jejunum being the most frequent site of obstruction.\textsuperscript{[1-2]} High position of FT extending up the abdomen accompanied by either absent or high placed ipsilateral ovary has been seen in some adult patients investigated for infertility.\textsuperscript{[5]} Müllerian duct abnormalities involving the uterus were also present.\textsuperscript{[5]} It is important to follow these associations when patients with NOC are transitioned to adult care.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Submitted:** 23-May-2021.
**Revised:** 16-Sep-2021.
**Accepted:** 16-Oct-2021.
**Published:** 26-Jul-2022.

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**Access this article online**

**Quick Response Code:**
Website: www.jiaps.com
DOI: 10.4103/jiaps.jiaps_100_21

**How to cite this article:** Thambidorai CR, Ahmad NA. Neonatal intestinal obstruction and bowel ischemia secondary to ovarian cyst. J Indian Assoc Pediatr Surg 2022;27:505-6.