

# Antenatal diagnosis and management of foetal intestinal volvulus

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### SUMMARY

**In-utero intestinal volvulus is a rare but potential life threatening foetal complications. It is a surgical emergency and delay in diagnosis or treatment can increase the morbidity and mortality to the foetus. We report a case of mild foetal bowel dilatation diagnosed at 21 weeks of gestation. She was closely follow up and at 31 weeks of gestation, in-utero intestinal volvulus was diagnosed with the characteristic 'whirlpool' sign on ultrasound examination. This case emphasises the importance of early recognition and quick decision to delivery when intestinal volvulus is diagnosed. This enabled early surgical intervention to prevent further foetal morbidity.**

### INTRODUCTION

Although in-utero intestinal volvulus is extremely rare, it is a surgical emergency as delay in the diagnosis and management is associated with severe morbidity and mortality. An antenatal sonographic finding of a volvulus is characteristic 'whirlpool' sign. We report a case of mild foetal bowel dilatation diagnosed at 21 weeks of gestation, which later progressed to intestinal volvulus at 31 weeks of gestation. Prompt and accurate diagnosis was made with this characteristic sign.

### CASE REPORT

A 37-year-old primigravida was referred at 21 weeks of gestation for suspected foetal bowel obstruction when foetal sonographic showed a dilated loop of foetal bowel measuring 4.1 cm, with diameter of 6.1 mm.

Repeated scan showed echogenic bowels and a dilated bowel loop with diameter up to 7.3 mm. There was no foetal ascites or calcification seen. Other foetal structures were noted to be normal.

Amniocentesis for karyotyping and array comparative genomic hybridization (CGH) were done. The karyotype was normal, with no microdeletion or duplication seen. Amniotic fluid tested for Cytomegalovirus infection and maternal blood for toxoplasmosis infection were negative.

At 23 weeks of gestation, the dilated bowel was 8.2 mm in diameter. The foetal growth was corresponding to gestation

and the liquor volume was normal. A joint counselling was done between obstetrician, paediatric surgeon and the couple. They were explained regarding the possible diagnosis of bowel obstruction and the anticipated management of the foetus postnatally.

Four weeks later, the loop of bowel was dilated up to 13 mm, with peristalsis seen. Otherwise, the foetus was growing well with parameters corresponding to date and the liquor volume was normal.

However, at 31 weeks of gestation, the dilated bowel diameter had increased to 28 mm with no peristaltic movement with small amount of foetal ascites was seen. A suspicion of bowel perforation with meconium peritonitis was made. Liquor volume and Doppler studies was normal. Couple was counselled and agreed for expectant management. Appointment was given two days later to detect any worsening of the condition.

Two days later, the loop of bowel showed the characteristic 'Whirlpool' appearance (Figure 1). Ascites was increased with septation seen within. Polyhydramnios was detected with AFI of 29.5 cm. Possibility of intestinal volvulus was made. Mother also perceived the foetal movement was reduced and cardiotocography (CTG) showed an abnormal tracing. A decision was made for delivery via emergency Caesarean Section.

A baby boy was delivered with birth weight of 1730 gram. Apgar score was seven in first minute and eight in fifth minute. The baby was assessed by the paediatric surgeon and underwent emergency laparotomy a few hours after delivery. Intraoperatively, giant cystic meconium peritonitis with complete disruption of jejunum at 34 cm from duodeno-jejunal (DJ) flexure as a result of in-utero volvulus of the mid-portion of small bowel was seen (Figure 2). Viable small bowel about 72 cm was noted distal to the volvulus. No malrotation present. Partial small bowel resection with end to end small bowel anastomosis and division of adhesion made between the intestines was done with no complication.

### DISCUSSION

Intestinal volvulus is a condition in which the small bowel and proximal colon twist around the superior mesenteric

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Fig. 1: Ultrasonography image of the "Whirlpool Sign".



Fig. 2: Intraoperative findings of the volvulus of the mid-portion of the small bowel.

artery.<sup>1</sup> It is a rare but life threatening surgical emergency manifesting after birth and as such rarely diagnosed prenatally. Causes of intestinal volvulus includes intestinal malrotation, congenital malformations such as segmental defect of the smooth muscle of the bowel or a primary defect in the mesentery, meconium ileus or bowel atresia.<sup>1</sup>

Although volvulus with malrotation usually occurs in late neonatal period, most cases of in-utero volvulus occur without malrotation. In a study of patients without malrotation, Black et al. have shown that segmental mesenteric defects were common in this group and had an etiological role.<sup>2</sup> These occurred either due to excess growth of small segment of bowel or uncontrolled growth of an isolated segment of the mesentery, resulting in a portion of bowel having a small segment of mesentery with a narrow base which predisposes to volvulus.

The timing and accurate diagnosis of intestinal volvulus is extremely important and have a significant effect for the mother as well as for the foetus. Recognising the "Whirlpool sign" is regarded as the most characteristic sign of in-utero intestinal volvulus.<sup>3</sup> In this case, the intestinal volvulus was finally recognised at 31 weeks based on the characteristic 'Whirlpool sign' as shown in the ultrasound. Other characteristic sign of volvulus to look for is the 'coffee bean sign'. Other indirect findings that may present in intestinal volvulus are ascites, discrete cystic or solid abdominal mass, peritoneal calcification or polyhydramnios. If left uncorrected, the volvulus may have resulted in vascular compromise, which can cause gangrene and result in intestinal atresia of the ischaemic segment.

Meconium peritonitis was suspected two days before the presence of the 'Whirlpool sign'. It is not clear whether early treatment meconium peritonitis improves the prognosis of foetus remote from term. In earlier reports, there was nearly 80% rate of spontaneous intrauterine remission but recent larger studies suggest that 76-100% of prenatal diagnosed cases do not spontaneously resolved and persistent of ascites, pseudocyst, or dilated bowel on ultrasound are more sensitive (92%) to predict postnatal surgery.<sup>4</sup> Therefore, a conservative management was initially taken due to the prematurity supported by the normal liquor and Doppler studies.

With early recognition and diagnosis of intestinal volvulus, a plan for emergency delivery and neonatal surgery before foetal deterioration is extremely important. In this case, the intestinal volvulus occurred and was recognised at 31 weeks of gestation, when the foetus is still preterm. Neonatal support is important as it does not only address the problems associated with premature delivery, but the need to stabilise and prepare the foetus for immediate surgery for the intestinal volvulus. A good communication between the multidisciplinary teams which comprise of the Obstetrician, Neonatologist, Anaesthetist, Paediatric surgeon is extremely important.

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