Case Report

Prenatal scan saves lives: Jejunal atresia with midgut volvulus: A case report

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Introduction

Jejunal atresia with midgut volvulus is a rare neonatal surgical emergency, in which the midgut twists around the superior mesenteric vessels.[1] Midgut volvulus results in obstruction and ischaemic necrosis of the intestines. It may be associated with bowel malrotation, cystic fibrosis, omphalocele, gastroschisis and renal or cardiac anomalies.[2]

Late intrauterine mesenteric vascular accidents may result in small and large intestinal atresia which may occur as a consequence of intestinal volvulus.[3]

Maternal vasoconstrictive medications, cigarette smoking and cocaine use may contribute to the development of small intestinal atresia, including jejunal atresia.[4] The majority of the midgut volvulus cases were reported after 30 weeks of gestation. [5] The incidence was reported as 1 in 5000 to 1 in 14000 live births and the risk is same for males and females.[6.]

Midgut volvulus could be diagnosed prenatally during the routine antenatal scan. Unique ultrasound scan features could be helpful in the prenatal diagnosis of bowel obstruction.[7] Prenatal diagnosis and early involvement of a multidisciplinary team, improve the neonatal outcome.

Surgical correction needs to be performed as soon as the general condition of the neonate is stabilized and after the exclusion of associated malformations. The postoperative mortality of intestinal atresia in the absence of other abnormalities is low.[8] The postoperative outcome depends on gestational age at birth, anatomical location of intestinal atresia and the size of the defect.[9]

Case report

A 29-year-old, woman was admitted to the university obstetric unit at 36 weeks of gestation for further management of dilated foetal bowel loops. Her previous two pregnancies ended in first trimester and second trimester miscarriages respectively and the causes were unknown. The current pregnancy is following a spontaneous conception and she was offered a cervical cerclage at 14 weeks of gestation for the current pregnancy. Her aneuploidy screening and 20-week anomaly scan were normal.

Foetal bowel loop dilatation was first noted at 28-week growth scan and she was regularly followed up with prenatal scans. At 32-week scan, bowel loops became more distended in the mid abdomen in a spiral shape (Whirlpool appearance). Foetal growth parameters were appropriate for gestation and the amniotic fluid index was normal.

At 36 weeks of gestation, progressive dilatation of bowel loops with increasing abdominal circumference and a small amount of foetal ascites were noted. Except for foetal abdominal circumference, the other growth parameters were within the normal limits (Figure 1).

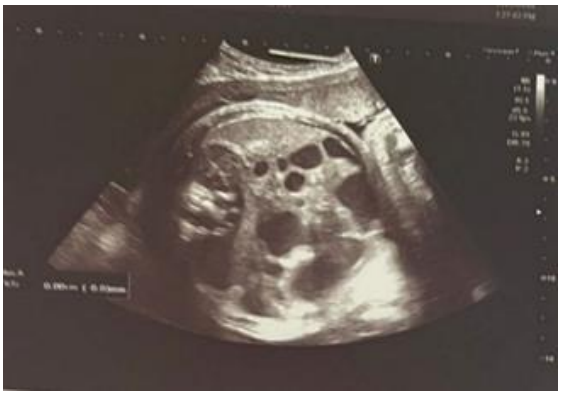

Figure 1: Ultrasound scan of the foetus at 36 weeks of gestation

Following a multidisciplinary team discussion, antenatal steroids were given and planned for elective caesarean section at 37 weeks.

The mother was counselled regarding the diagnosis, prognosis, and planned management. The baby was delivered by elective caesarean section at 37 weeks in the presence of neonatal and paediatric surgical teams.

A 3.44 kg baby boy was delivered with a good APGAR score (8/8/9). A nasogastric tube was inserted immediately after the birth as the neonatal abdomen was distended and 30 ml of bilious secretion was drained. An early neonatal ultrasound scan revealed distended bowel loops in a whirlpool appearance and an abdominal radiograph showed gas-filled bowel loops (Figure 2).

An exploratory laparotomy was done on day one after birth and it showed proximal jejunal atresia complicated with a volvulus. The volvulus was seen up to duodenojejunal flexure.

There were multiple adhesions with calcified tissue material around volvulus. A mesenteric gap with an atretic jejunal segment was noted about 40 cm from the duodenojejunal junction. The proximal part of the atretic segment was dilated and the distal segment was tortuous. There was no evidence of malrotation as duodenojejunal flexure was found on the left side and caecum was seen in the right iliac fossa region (Figure 3). These findings supported the diagnosis of type III B jejunoileal atresia.

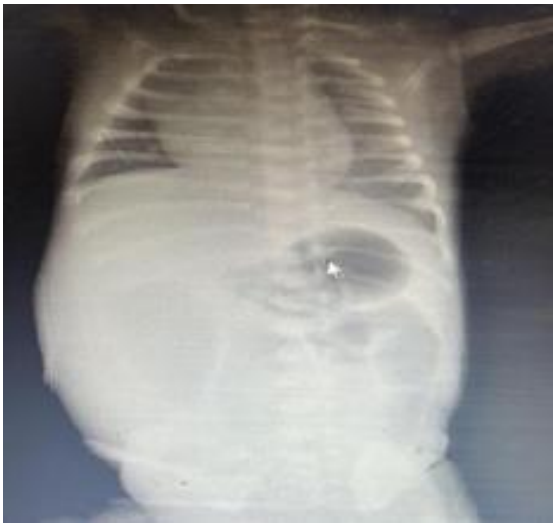

Figure 2: Abdominal radiograph showing gas-filled bowel loops

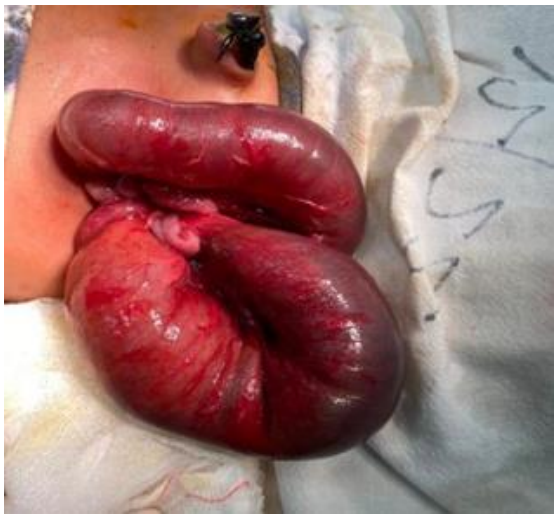

Figure 3: Explorative laparotomy showing dilated small bowel

After tapering the proximal atretic segment, an end-to-end jejunal anastomosis was performed. The post-operative period was uneventful and feeding was gradually introduced. The baby made a full recovery.

Discussion

Jejunal atresia is classified mainly into four types and type III is further classified into III A and B .[10]

When a portion of the gut twists around the fixed point of the mesentery, volvulus occurs.[11] Midgut volvulus can be a cause or effect of jejunal atresia. Midgut rotation around mesentery result in midgut volvulus and subsequent pathological changes result in jejunal atresia. Similarly, prenatal vascular incidents can result in jejunal atresia and midgut volvulus can occur around the atretic jejunal part.[3]

Jejunal atresia itself cannot be detected on ultrasound scans. In this case, bowel loop dilation was first observed at 28th week antenatal ultrasound scan and subsequent scans raised strong suspicion of midgut obstruction. Follow up scans showed progressive bowel dilation, an increase in foetal abdominal circumference and the presence of foetal ascites which suggested the possibility of midgut volvulus.

Adhesions, calcifications and distal atretic segment tortuosity noted during the surgery may be the result of the previous intrauterine perforations and healing.

Progressive gut dilations noted in the prenatal ultrasonography prompted to plan the delivery and the early paediatric surgical interventions improved the neonatal outcome in our case.

This case highlights the need to raise early concerns of bowel loop abnormalities found in antenatal ultrasonography and need for follow up scans in the management. Timely intervention with proper diagnosis aids in saving life. Though foetal Magnetic Resonance Imaging would be useful in diagnosing volvulus and related intrauterine gut abnormalities precisely, this case was managed with foetal ultrasonography with colour Doppler during the antenatal period. The operative findings were in line with prenatal scan findings.

Conclusion

Our experience highlights the importance of skilled antenatal growth scans in detecting fetal gut abnormalities. Early detection and regular follow-up scans play a crucial role in achieving favorable outcomes in cases of jejunal atresia

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Conflict of interest

None

References

1. Yoo SJ, Park KW, Cho SY, et al. Definitive diagnosis of intestinal volvulus in utero. Ultrasound Obstet Gynecol 1999;13:200–3
2. Bartholmot C, Faure JM, Grosjean F, Couture A, Forgues D, Fuchs F, Prodhomme O. Prenatal diagnosis of antenatal midgut volvulus: Specific ultrasound features. Prenat Diagn 2019;39(1):16-25. DOI: 10.1002/pd.5392.
3. Aihole JS. A rare case of jejunal atresia. Int J Surg Case Rep. 2022;90:106714. DOI: 10.1016/j.ijscr.2021.106714.
4. Werler MM, Sheehan JE and Mitchell AA. Association of Vasoconstrictive Exposures with Risks of Gastroschisis and Small Intestinal Atresia. Epidemiology 2003;14(3):349–54.
5. Musilova I, Elias P, Kacerovsky M. Second-trimester presentation of midgut volvulus without intestinal malrotation. Ultrasound Obstet Gynecol. 2019;54(3):422-3. DOI: 10.1002/uog.20239.
6. Adams SD, Stanton MP. Malrotation and intestinal atresia. Early Hum Dev. 2014 ;90(12):921-5. DOI: 10.1016/j.earlhumdev.2014.09.017.
7. Chen D, Tam KH, Zhang Y, Xiao S, Yang C, Tang X. Prenatal diagnosis of midgut volvulus with jejunal atresia by ultrasonography. J Obstet Gynaecol Res 2020 ;46(7):1203-6. DOI: 10.1111/jog.14296.
8. Sciarrone A, Teruzzi E, Pertusio A, Bastonero S, Errante G, Todros T, Viora E. Fetal midgut volvulus: report of eight cases. J Matern Fetal Neonatal Med. 2016;29(8):1322-7. DOI: 10.3109/14767058.2015.1047336.
9. Galani A, Zikopoulos A, Papandreou L, Mastora E, Zikopoulos K, Makrydimas G. Prenatal Diagnosis of Fetal Jejunal Atresia: A Case Report. Cureus 2021; 13(10): e18947. DOI 10.7759/cureus.18947.
10. Dalla Vecchia LK, Grosfeld JL, West KW, Rescorla FJ, Scherer LR, Engum SA. Intestinal Atresia and Stenosis: A 25-Year Experience With 277 Cases. Arch Surg. 1998;133(5):490–497. doi:10.1001/archsurg.133.5.490
11. Kapadia MR. Volvulus of the Small Bowel and Colon. Clin Colon Rectal Surg. 2017;30(1):40-45. DOI: 10.1055/s-0036-159342