Occult Intrauterine Fetal Abdominal Emergencies Precipitating Emergency Caesarean Section

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Background

- The fetus can be afflicted with a multitude of rare occult but life threatening intra-abdominal conditions in-utero
- They can affect maternal well-being, and present as non-specific fetal distress during pregnancy or fetal hydrops, necessitating emergency caesarean section (EmCS)
- We report two of such rare cases in the presentation below
- ❖Case 1: Intrauterine primary segmental intestinal volvulus in the absence of malrotation or other congenital malformation presenting as non-specific fetal distress
- ❖Case 2: Meconium peritonitis and pseudocyst presenting as nonimmune hydrops fetalis
- Prompt recognition and expedient surgical intervention after birth can avoid fetal mortality

Case 1: Intrauterine Primary Segmental Intestinal Volvulus

Antenatally well, pregnancy course uncomplicated

Delivered via EmCS at GA 35 weeks for non-reassuring fetal status

Coded blue at 1 minute of life and promptly intubated

Neonatal team identified issue as surgical cause within 1.5 hours and referred to Paediatric Surgery

On examination: Abdomen mildly distended, anus patent with slight meconium stains

Investigations

Abdominal ultrasound:
- Multiple dilated aperistaltic bowel loops with maximum diameter of 2.3cm
- No clear transition point
- Intra-peritoneal free fluid

Doppler imaging (Fig. 1a):
- Lack of vascularity in the bowel wall concerning for ischemia

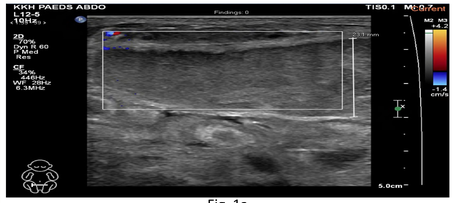

Fig. 1a

Day 1 of life
Underwent exploratory laparotomy which revealed segmental small bowel volvulus
Decision made for small bowel resection and anastomosis

Intra-operative Findings
- Segmental 20cm length of small bowel volvulus about 30cm proximal to the Ileocecal valve that was twisted 720 degrees and grossly necrotic (Fig. 1b and 1c)
- No atresia, primary mesentery defects or malrotation were found

Fig. 1b: Gangrenous small bowel emerging from laparotomy incision

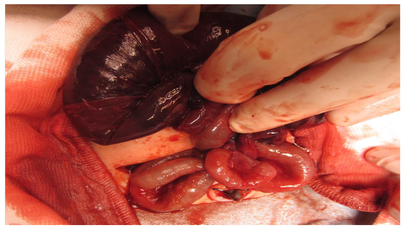

Fig. 1c: Segmental small bowel volvulus that appears grossly necrotic

Post-operatively recovered well and currently thriving well on oral feeds

Case 2: Meconium Peritonitis and Pseudocyst

Antenatally: Immune hydrops and maternal infective screens negative

At GA 20 weeks: Ultrasound scan showed multiloculated cystic mass in the central abdomen
At GA 30 weeks: Ultrasound scan showed increased cyst size with concomitant hydrops fetalis and polyhydramnios

Delivered via EmCS at GA 31 weeks at private hospital for worsening hydrops fetalis with non-reassuring fetal status
Intubated shortly after birth for worsening respiratory distress

Transferred via Children's Hospital Emergency Transfer Service (CHETS) to KK Women's and Children's Hospital
Promptly referred to Pediatric Surgery

On examination: Abdomen hugely distended with splinting of diaphragm

Investigations

Chest and Abdominal X-rays (Fig 2a):
- Central ovoid abdominal mass displacing adjacent bowel loops
- Generalized thickening of soft tissues consistent with hydrops fetalis

Abdominal ultrasound (Fig 2b):
- Large multiseptated cystic mass with mobile low-level echoes layering within locules

CT scan (Fig 2c):
- 7.1 x 5.6 x 6.5cm fluid-filled cystic mass with air-fluid level located in the abdominopelvic region
- Contains pockets of gas within the locules of fluid, displacing the undilated bowel loops around it
- Possible etiologies: duplication, mesenteric and ovarian cysts

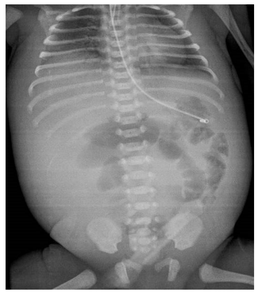

Fig. 2a (CXR and AXR): Ovoid opacity in central abdomen

Fig. 2b (US abdo): Large multiseptated cystic mass with internal echoes

Fig. 2c (CT): Large midline cystic mass containing air-fluid levels

Underwent emergency surgery within 12 hours of transfer due to deteriorating respiratory status

Intra-operative Findings
- Thick meconium pseudocyst extending from subhepatic region to bladder
- Proximal ileal loop seen draining into pseudocyst causing air to enter hence increasing abdominal distension causing respiratory distress
- Pseudocyst and perforated ileal segment were excised and an ileostomy created
- Healthy small bowel loops posterior to the cyst were conserved and remaining length was 66.5cm

Post-operatively, child was gradually initiated on enteral feeding

Ileostomy was reversed subsequently at 2.5 months of age

Currently 7 years old and thriving well on oral feeds

Discussion

Case 1
- Intrauterine segmental intestinal volvulus without any obvious predisposing cause is uncommon as most cases are associated with intestinal malrotation or congenital malformations such as intestinal atresia, omphalocele, gastroschisis and primary mesentery defect, which can be picked up antenatally and anticipated
- In addition, volvulus commonly presents itself at Day 3-4 of life and on examination, this child's abdomen was only mildly distended

Case 2
- The presentation of non-immune hydrops fetalis with a rapidly expanding abdomen is also atypical of meconium pseudocyst as it usually tends to get walled off rather than communicate with the proximal bowel
- In the absence of risk factors such as cardiovascular abnormalities, anaemia and chromosomal aneuploidy, meconium pseudocyst manifesting as non-immune hydrops fetalis is a rare occurrence
- There were also no radiological signs of intraperitoneal calcifications despite being pathognomonic of meconium pseudocyst, making pre-operative diagnosis difficult

❖Antenatal diagnosis of intrauterine fetal abnormalities allow for preparations and relevant personals to be on standby-by to promptly render the care needed
❖However, these two cases presented with undiagnosed intrauterine fetal abdominal emergencies that provided diagnostic conundrums on presentation
❖Diagnoses were only made intra-operatively after high suspicions of surgical causes by alert obstetricians and neonatologists prompted early involvement of the surgical team that expedited neonatal surgeries

Conclusion

- Intrauterine fetal acute abdomen can present as non-specific fetal distress and necessitate emergency Caesarean section and neonatal surgery
- Often, preoperative diagnosis in-utero is challenging
- Clinicians should be aware of potential occult intrauterine fetal intra-abdominal emergencies in order to facilitate the activation of emergent obstetric intervention and subsequent neonatal surgery, or transfer to an institution with immediate access to such services, so as to improve survival outcomes

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