CASE REPORT

Neonatal prolapsed patent vitellointestinal duct

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SUMMARY

A case of a prolapsed patent vitellointestinal duct (PVID) in a 10-day-old neonate who presented with vomiting and poor weight gain with partial intestinal obstruction and a flower like pink, prolapsing lesion at his umbilicus has been reported. A limited contrast study through the tubular structure confirmed it to be a PVID. He underwent transumbilical exploration and resection and anastomosis uneventfully. Persistence of the vitellointestinal duct as a whole or part of it leads to a wide variety of anomalies–Meckel's diverticulum is the commonest lesion and a PVID is the rarest. Umbilical cord clamping flush with the abdominal wall may convert a Meckel's diverticulum prolapsing in the base of umbilical ring into a PVID. Careful assessment should be made for associated anomalies. Transumbilical exploration gives the best cosmetic and functional results.

BACKGROUND

At around 3 weeks of embryonic life a communication exists between the embryonic gut and the yolk-sac which narrows into a tube called the vitellointestinal duct. It usually gets obliterated by the end of the seventh week.[1] Persistence of various portions gives rise to a spectrum of interesting congenital anomalies—sinus, cyst, fistula, band, diverticulum, etc. The commonest of these is Meckel's diverticulum and complete patency of the vitellointestinal duct is rare.[2–7] Its prolapse in the newborn period is even rarer which leads to obstruction or strangulation and dictates early correction.

CASE PRESENTATION

The patient was a term baby boy born to a mother who had normal prenatal scans but the pregnancy itself had been complicated by gestational diabetes. He was noted to have some watery and mucous discharge from his umbilicus from birth. He passed urine and meconium in the first few hours after birth.

The umbilical cord appeared bulky and originally separated on day 6 of life, revealing a red 'flower-like' lesion below which there was a small quantity of watery and some sticky discharge which increased in amount 2 days prior to presentation.

A bulky umbilical cord with discharge from it is an early sign of the presence of patent vitellointestinal duct (PVID) or patent urachus. It was not clear whether the nature of the very small amount of discharge was intestinal contents or urine. He failed to regain birthweight and had started non-bilious vomiting with more prolapse of tubular structure through the umbilicus. Examination showed a soft, non-distended abdomen with a tubular mucosa-lined structure at the umbilicus (figure 1A).

INVESTIGATIONS

Urine, haematological, biochemical and coagulation profiles were normal. Ultrasound scan of the abdomen was normal. A contrast study via a tube passed through the prolapsed mucosa-lined tube showed contrast passing directly into the terminal ileum, confirming a prolapsed PVID. There was some bowel dilation and fluid level on a lateral film suggesting partial obstruction (figure 1B).

DIFFERENTIAL DIAGNOSIS

Patent prolapsed urachal sinus or urachus and strangulated Littre's hernia were considered in the differential diagnosis clinically. The contrast studies through the duct via a catheter confirmed the diagnosis.

TREATMENT

Examination under anaesthesia did not show any mass underneath to suggest any enteral or urachal cyst and it was possible to reduce the prolapsed duct completely into the abdomen through the umbilical ring. He underwent transumbilical exploration with resection of the prolapsed PVID and primary anastomosis uneventfully. There were no other associated anomalies.

OUTCOME AND FOLLOW-UP

The patient's postoperative period was uneventful and he started on feeds after 24 h. He was discharged home after 48 h. Histopathological examination of the excised specimen confirmed it to be a PVID without any evidence of ectopic, gastric or pancreatic mucosa. At follow-up he was thriving well and asymptomatic at 3 months and discharged from the clinic back to the general practitioner.

DISCUSSION

Complete PVID with its prolapse in the neonatal period with partial obstruction and failure to thrive is an infrequent anomaly with a limited number of cases reported in the literature. There have been only five cases, reported in the English medical literature describing prolapse of ileal loops through a PVID.[1–3]

The wide variety of remnants includes mucosal remnants with raspberry tumour, sinus, cyst, fistula and congenital bands. Clinical presentation may be primarily due to the anomalies themselves or associated complications of intestinal obstruction, strangulation, prolapse, volvulus, intussusceptions, adhesions, bleeding or rupture. A schematic illustration of the prolapsed PVID has been given to

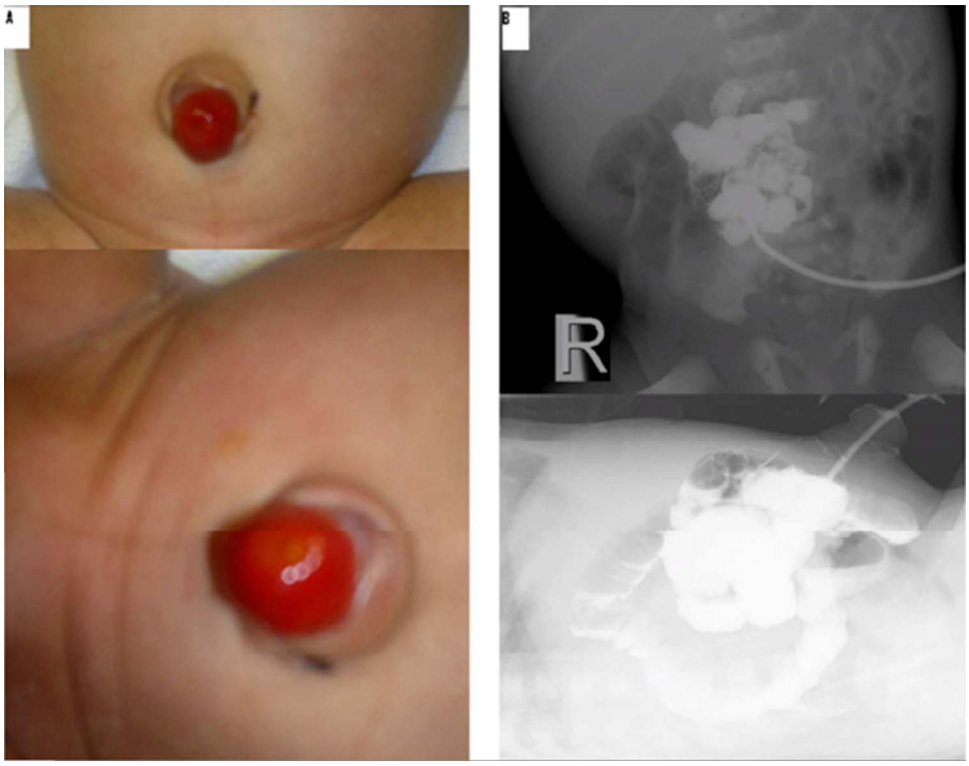

Figure 1 (A) Clinical photographs showing prolapse patent vitellointestinal duct. (B) Contrast study delineating the prolapsed duct and intestinal loops.

easily understand the events leading to this complication as shown in figure 2.

Early detection of the PVID with prompt surgical management could prevent rare presentation of complications like prolapse and ischaemia. Prenatal diagnosis may suggest hernia of the umbilical cord or exomphalos minor which fails to regress on serial ultrasonography. If it is completely covered at birth, it is difficult to diagnose as the umbilical cord coverings are masking it. A mucosa lined tubular structure often described as a raspberry-like lesion should raise suspicion.

Diagnosis is usually straightforward but sometimes a patent urachus may be associated with PVID and a contrast study helps in identifying them separately.[2 3] The management of PVID is transperitoneal while that of urachal anomalies is via an extraperitoneal approach.

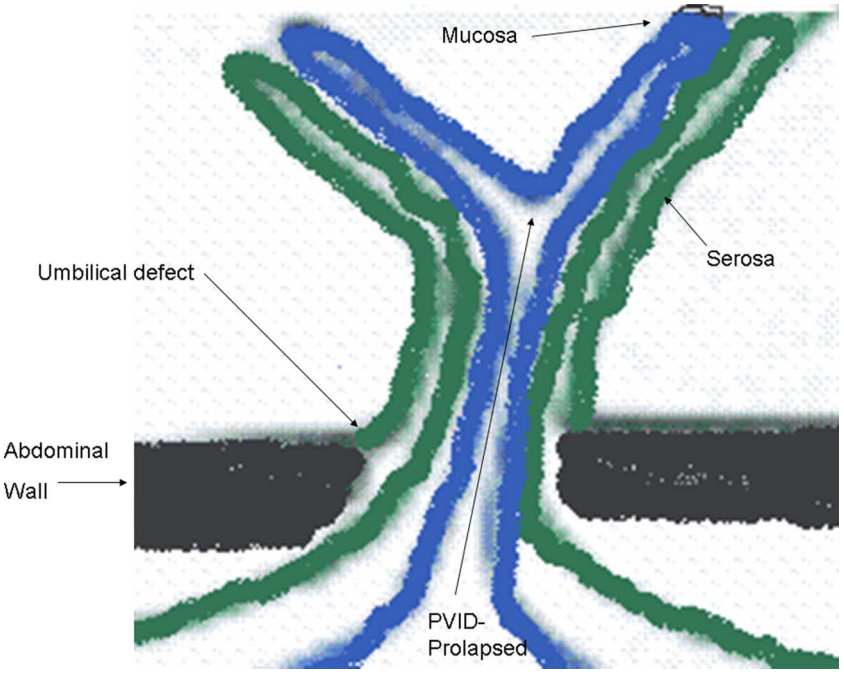

Figure 2 Schematic illustration of a prolapsed patent vitellointestinal duct—the duct everts through the umbilical defect in the abdominal wall and the mucosa-lined duct prolapses similar to intussusception telescoping out through the umbilicus.

Initially reduction of the prolapsed PVID under general anaesthesia is performed. We prefer transumbilical circumferential mobilisation of the PVID thereby preserving the original umbilical ring and the PVID may be dissected free from the peritoneal attachments and then delivered outside. If there are associated complications of ectopic gastric or pancreatic mucosa or associated obstruction or strangulation with ischaemic effects, resection and end-to-end anastomosis is preferable to wedge resection.

Carbimazole and methimazole treatment for maternal hyperthyroidism has been reported as a possible association with this anomaly as has choanal atresia.[8 9]

Although prolapsed PVID is a rare cause of an acute abdomen in the newborn, prognosis is usually excellent with regard to anatomic, functional and cosmetic aspects.[10] It can present as a life-threatening emergency later in childhood.[11]

Learning points

- Persistence of the vitellointestinal duct as a whole or in part leads to a wide variety of anomalies—Meckel's diverticulum is the commonest lesion and patent vitellointestinal duct (PVID) is the rarest.
- In routine neonatal care, the umbilical cord clamp should be applied a distance away from the base of umbilicus to avoid clamping a PVID which may present at the base as a small knuckle. A bulky umbilical cord with discharge is an early sign of a possible PVID.
- Careful assessment should be made for associated anomalies which include bowel atresias and stenoses, failure of caecal descent, malrotation, malfixation, reversed bowel rotation and exomphalos.
- A contrast study confirms the nature of the lesion and excludes urachal lesions.
- Transumbilical exploration gives the best cosmetic and functional results.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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