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PROLAPSE OF ILEAL LOOPS THROUGH THE PATENT VITELLO-INTESTINAL DUCT: A CASE SERIES OF SEVEN CASES

Paediatric Surgery

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ABSTRACT

Vitellointesinal duct connects the gut to yolk sac. During development of fetus VID closes. However as a result of developmental anomaly it may persist as patent duct. Sometimes if the defect is wide enough or there is increase abdominal pressure, it may complicate to prolapse of bowel through this patent duct. In certain scenario prolapse bowel may lead to gangrenous changes and complicating the situation to septic shock and even death. We have collected seven cases of Patent Vitellointesinal duct with prolapse of bowel loops through it, some of them presented in state of septic shock and one of them expired during resuscitation. With that we conclude that with early identification, definitive treatment of Patent VID by surgical correction should not be delayed to prevent lethal complications.

KEYWORDS

Prolapse bowel through VID, Patent vitellointestinal duct, gangrenous bowel though VID, ileal though Patent VID, death due to VID

INTRODUCTION-

Vitellointesinal duct is an embryological structure that connects the gut to yolk sac. During the development at 5th week of gestation midgut herniates through abdominal wall because there is no enough space inside the abdomen at that age. Apex of herniated bowel is connected to yolk sac via vitellointestinal duct and apex is formed at axis of SMA. At around 10 week herniated bowel returns back to its final position that is intraperitoneal.**1** In this complex process of development, deviation from normal process at any stage causes various developmental anomalies that varies from mild asymptomatic anomaly to severe life threatening anomaly. Name of anomalies are Meckel Diverticulum, vitelline cord, umblical sinus, enteric fistula or patent Vitello-intestinal duct.**1** Meckel's diverticulum is most common anomaly and patent VID is rare with incidence of 0.0053% but they are symptomatic. **2** Prolapse occurs if defect is wide enough to allow bowel to come out or due to increased intra-abdominal pressure like cry or cough. Prolapse can be partial or complete. The condition requires identification and early management to avoid complications. Cord tying in such neonates should be done with great care using sterile thread to prevent injury to the prolapsed bowel. **2** The male to female ratio of patent vitellointestinal ducts is 8:1. **3**

DISCUSSION

Vitellointestinal duct connects gut to yolk sac and provides nutrients till placenta get developed. Duct obliterates at 7-8 week. Anomalies in this process may occur as failure of bowel to return in peritoneum at 10 week presenting as omphalocele or gastroschisis, or malrotation of gut or failure to obliterate the vitellointestinal duct.

Failure in obliteration of the duct varies from very asymptomatic and most common form Meckel diverticulum to very symptomatic and dangerous but rare form patent vitellointestinal duct. **8** Vitelline cord, umbilical sinus, enteric fistula or hemorrhagic umbilical mass are the other problems associated with failure of obliteration of vitellointestinal duct.

Patent vitellointestinal duct is rare but well known anomaly, incidence of patent duct is 0.0053% and incidence of mackel diverticulum is 1.3% on autopsies and 3.1% on laparotomies. **5** There is 4-6 % lifetime risk of developing complications in meckel diverticulum. Patent vitellointestinal duct is 8 times more common in male. **3** Infants with this anomaly are usually premature. **5** The association of patent VID with anal stenosis has been reported earlier. **9**

Patent vitellointestinal duct is easily diagnosable condition with fecal content at umbilicus. Sometimes discharge is not apparently feculent then fistulogram is taken to differentiate from patent urachus. **5**

Feculent discharge from umbilicus may be intermittent or continuous, and patent vitellointestinal duct need surgery. We have seen few cases

CASE NUMBER	PATIENT PARTICULARS	CLINICAL FEATURES		DIAGNOSIS	MANAGEMENT	OUTCOME
		History	Examination			
1 	• 1 month • Male • FTNVD	• fecal discharge through umbilicus since birth • vomiting and not passing stool for 3 days	• signs of dehydration • herniation of bowel through umblicus with fecal discharge.	Prolapse in patent VID with intestinal obstruction	resection of ileum proximal and distal to VID and end to end anastomoses was done.	Discharged
2 	• 40 days • Female • normal vaginal delivery at 36 week	• fecal discharge from umbilicus since 1 day after birth. • Herniation of bowel since 2 days	• Herniation of edematous bowel loops with dusky colour • features of shock present	Prolapse in Patent VID with obstruction ?strangulation of bowel with septic shock.	laparotomy was done and affected bowel was excised and end and end anastomoses was done	Expired on POD-2 due to septic shock with cardiopulmonary arrest.

3 	• 20 days • male • normal vaginal delivery at 38 weeks	• feculent discharge from umbilicus since birth • multiple episodes of vomiting since 2 days	• Reddish protruding mass on umbilicus with fecal discharge from center of that mass.	patent VID with mucosal prolapse	Base of VID was clamped and excised and defect in ileum repaired in 2 layers, fistula was everted and removed through umbilicus.	Discharged on POD-6.
4 	• 20 days • male • lower segment cesarean section at 37 weeks	• fecal discharge from umbilicus since birth • Bowel prolapse from umbilicus and not passing stool from 2 days	• Signs of dehydration • Gangrenous changes in prolapsed bowel	prolapse of bowel through patent VID with gangrenous changes in herniated bowel	exploratory laparotomy with resection of affected ileum with end to end anastomoses of ileum	septic shock in post op period and also had cardiopulmonary arrest on POD-1 but revived, improved and discharged
5 	• 15 days • female • normal vaginal delivery at 37 weeks	• fecal discharge from umbilicus after birth • unable to pass stool for 6 days	• severe dehydration, • tachycardia, hypotension, oliguria • herniation of bowel through umbilicus for 6 days	septic shock with gangrenous changes in prolapsed patent VID	affected segment excised and end to end anastomoses of ileum was done	Discharged
6	• 10 days • female • lower segment cesarean section at 35 week	• fecal discharge from umbilicus since birth • reddish mass on umbilicus for 3 days	• herniation of mucosa from patent vitellointestinal duct	Prolapse of mucosa through patent VID	5 cm incision given in midline around umblicus, VID tract excised and defect in ileum was primary repaired	Discharged
7	• 45 days • Male • normal vaginal delivery at 36 weeks	• fecal discharge through umbilicus since birth • prolapse of bowel through umbilicus for 5 days	• shock • herniation gangrenous bowel	septic shock with gangrenous prolapsed bowel in patent VID	resection of affected bowel and double barrel Ileostomy	Discharged

of prolapse of bowel out of the abdomen through that patent duct. Prolapse leads to T shaped bowel protrusion through umblicus. **4**

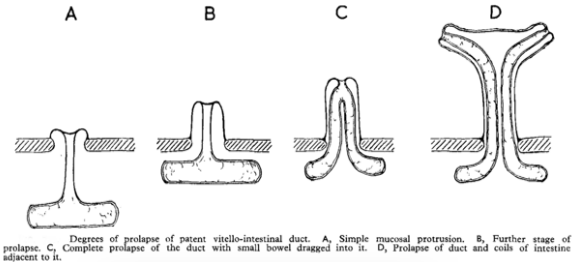
Factors responsible for prolapsed of bowel may be wide weak umbilical defect, condition that cause increase intra-abdominal pressure along with partial bowel obstruction at Patent VID sites. **10** Wide defect and short length of duct are predisposing factors for the prolapse and prolapse may also complicate itself with skin excoriation, Obstruction, strangulation, gangrene and sepsis and finally death. **2**

So urgent surgical intervention is necessary in prolapse to reduce prolapse that is aimed to prevent life threatening complication like gangrene and sepsis. Principle of surgery is to reduce to prolapsed bowel, excise the VID and maintain the ileal continuity by surgical measures.

With reduction of prolapse either VID is primarily closed or VID segment of bowel is resected and anastomosis done or exteriorisation of bowel as Ileostomy done if patient is sick and Ileostomy closure done later. **2,5** Although, as described previously, spontaneous regression of patent VID may occur, the fact that patent VID can cause major morbidity and mortality in infants means that any infant presenting with patent VID should be treated promptly.**7**

Hence vitellointestinal duct should be operated promptly without keeping wait and giving risk of prolapse, gangrene, sepsis and death. And prognosis of patent vitellointestinal duct with prolapse is very bad.

Pathological assessment shows ectopic epithelium in the ducal tract having gastric epithelium 33%, colonic epithelium 7%, small bowel epithelium 60% and ectopic pancreas also reporting in 1 case. **3**



Degrees of prolapse of patent vitello-intestinal duct. A, Simple mucosal protrusion. B, Further stage of prolapse. C, Complete prolapse of the duct with small bowel dragged into it. D, Prolapse of duct and coils of intestine adjacent to it.

Diagram- Degree of prolapse of patent vitello-intestinal duct **6**

CONCLUSION

- Delay in treatment of patent VID may lead to such lethal complications.
- Early definitive surgery on identification is the key to avoid complications.

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