



A Bolt from the “Band” - Case Report of an Unusual Mesodiverticular Band Causing Small Bowel Obstruction

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Authors' contributions

This work was carried out in collaboration among all authors. Author IS was the responsible consultant surgeon in-charge of the overall care of the patient and on whom the final decision on the patient management rested. Authors IS and MZ wrote the first draft of the manuscript. Authors MZ and TKA were involved in day-to-day patient care and follow up. Author TKA provided insight and valuable inputs to the manuscript, collected references and was responsible for typography of final manuscript draft. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Background: Aberrations in the normal involution of the Vitello-intestinal duct results in a broad entity termed the Omphalomesenteric Duct Remnants (ODR) with the Meckel's Diverticulum being its most popular member. This article focusses on one atypical variant of ODR, the mesodiverticular band which disrupts the apparent innocuous image of the ODRs often predisposing to life threatening situations in affected individuals as opposed to the usual ODR variants. This article brings to light the importance of such a rare entity with a brief review of available literature and attempts to invoke questions in the minds of the readers regarding several unexplored aspects of these disorders.

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Presentation of Case: A 28-year-old man who presented to the emergency with complaints of pain lower abdomen gradually spreading to the entire abdomen for the symptom duration of 2 days. Evaluation revealed the presence of a closed loop obstruction of the distal ileal segment with no clear etiology. The patient underwent laparotomy with resection of the obstructed gangrenous segment caused by a mesodiverticular band associated with a Meckel's diverticulum. The post op course was uneventful and discharge of the patient was done on POD-5.

Conclusion: The presence of the extremely rare mesodiverticular band with the Meckel's diverticulum can lead to causation of devastating consequences and even death in rare occasions secondary to bowel obstruction. This article attempts to raise questions on the need for screening and identification of such Omphalomesenteric duct remnants and also wishes to alert the reading surgeon to consider this entity in patients presenting with intestinal obstruction with no apparently identifiable cause as early suspicion and prompt treatment could prove to be lifesaving in such patients.

Keywords: Meckel diverticulum; mesodiverticular band; omphalomesenteric duct; vitello-intestinal duct; small bowel obstruction; case report.

ABBREVIATIONS

ODR : Omphalomesenteric Duct Remnants
 POD : Post Operative Day
 CECT : Contrast Enhanced Computed Tomography
 VID : Vitello Intestinal Duct

1. BACKGROUND

Bands are rare congenital entities seldom detected by investigational search or symptom analysis, often ignored as a benign anomaly but with capabilities of causing devastating outcomes at unexpected situations. This statement holds true starting right from the amniotic bands causing disfiguring malformations or even extremity losses to the more commonly encountered Ladd's band that presents dramatically with signs of intestinal obstruction in an apparently normal neonate [1]. We present one such very rarely encountered entity, the Mesodiverticular band associated with a Meckel's diverticulum which silently led to a young male presenting to us with a life-threatening closed loop obstruction.

List 1. Timeline

Day	Events
0	Patient presents to Emergency Department with features suggestive of acute intestinal Obstruction and complaints lasting for the past 2 days.
1	Patient was fully evaluated and Planned for emergency laparotomy considering CT finding of closed Loop Obstruction
5	Uneventful Post-Operative course and patient discharged on POD-5.

2. PRESENTATION OF CASE

We describe the case of a 28-year-old man who presented to us with complaints of pain lower abdomen gradually spreading to the entire abdomen for the symptom duration of 2 days. Pain was sudden, colicky, non-radiating with a steady increase in intensity with each passing hour. There was associated bilious vomiting episodes and obstipation, skewing us towards considering the diagnosis of an acute intestinal obstruction. There were no other relevant positive points in the history that could indicate a probable etiology.

Examination correlated well with the clinical suspicion as the patient showed signs of intestinal obstruction such as abdominal distension, raised bowel sounds and a collapsed rectum on examination without any signs of peritonitis. Supporting X-ray abdomen erect investigation revealed grossly dilated bowel loops with multiple air fluid levels suggesting a small bowel obstruction [Fig. 1]. CECT abdomen revealed the presence of a closed loop obstruction of the distal ileal segment with no clear comment possible on the exact etiology [Fig. 2].

On celiotomy, 500 ml of foul-smelling necrotic fluid was evacuated with the obstruction site revealing a gangrenous Meckel's diverticulum with an accompanying mesodiverticular band causing closed loop obstruction of a 30cm segment of ileal bowel distal to the band [Figs. 3, 4]. Considering the presence of necrotic abdominal contents and edematous unhealthy bowel ends, exteriorization of the bowel ends was done after

resecting the obstructed gangrenous bowel segment. The post-operative course was uneventful and the patient was discharged on the 5th day.

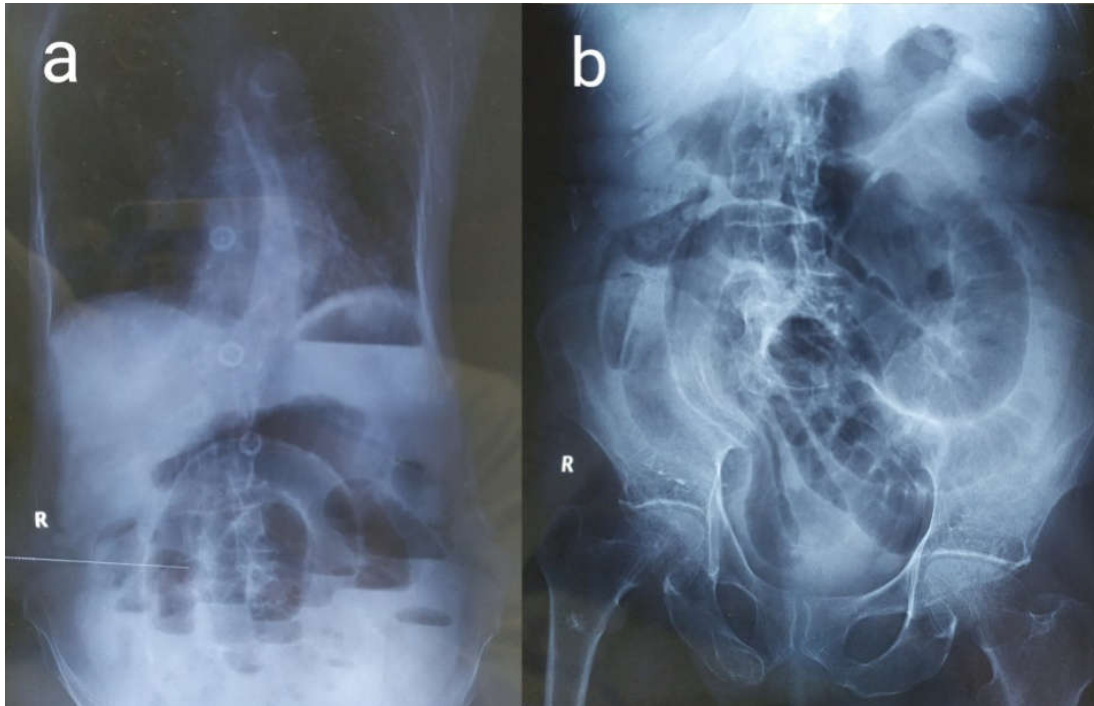


Fig. 1. a. X-ray Abdomen erect depicting multiple air fluid levels b. X-ray Abdomen supine film demonstrating grossly dilated small bowel loops with absence of gas shadow in rectum

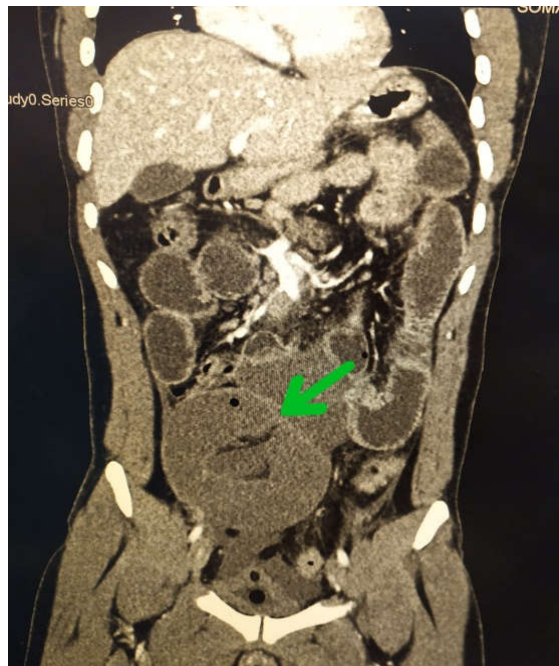


Fig. 2. CECT abdomen showing closed loop obstruction of the distal Ileal Bowel segment (Green Arrow) with no apparent delineable cause

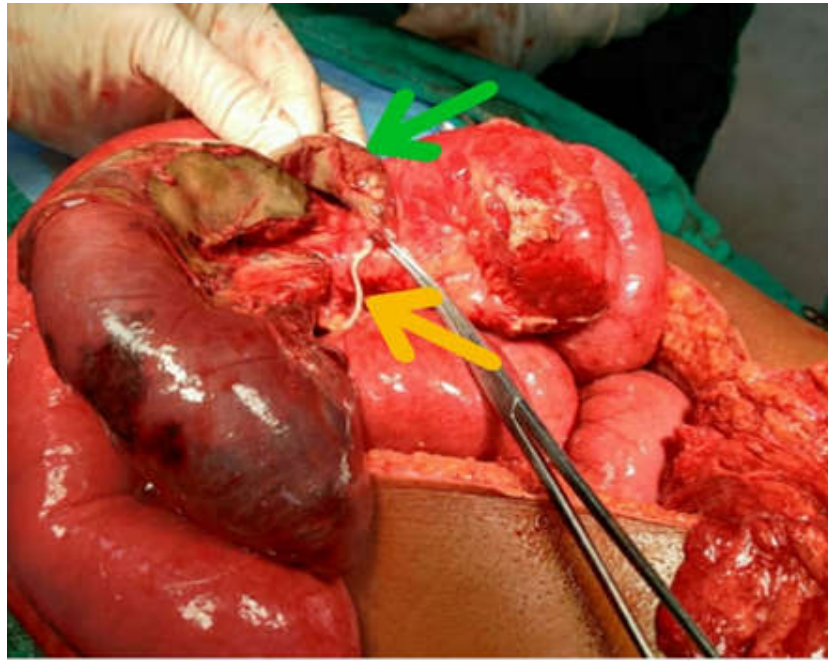


Fig. 3. Meckel's Diverticulum (Green Arrow) with a mesodiverticular band (Yellow Arrow) in intraoperative picture

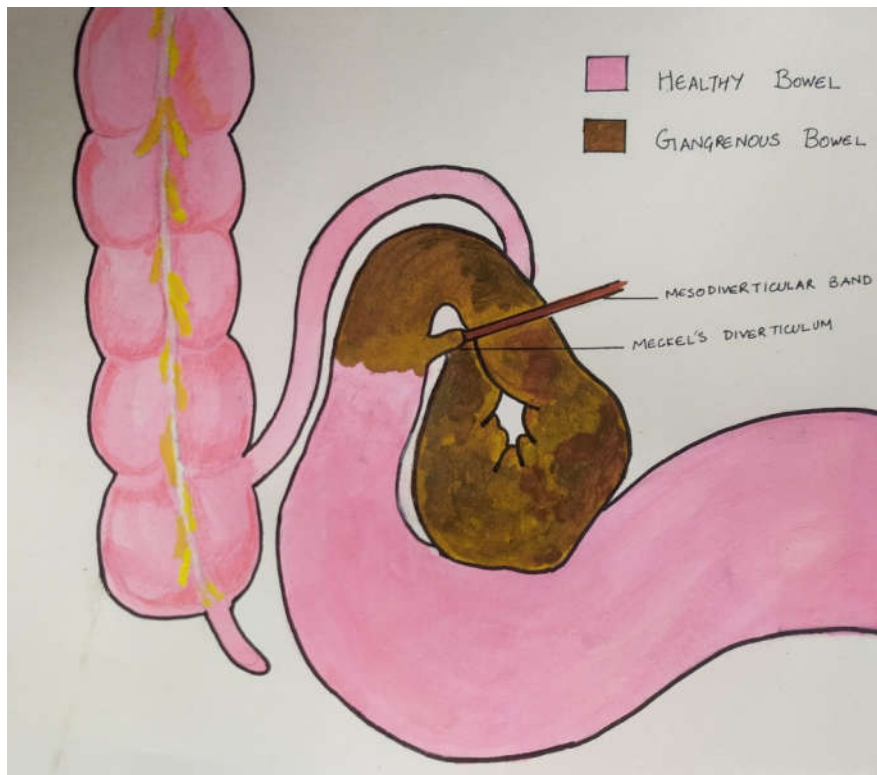


Fig. 4. Diagrammatic Representation of the band causing gangrenous obstruction of the small bowel segment

3. DISCUSSION

Vitello intestinal duct (VID) is an embryonic tube connecting yolk sac and midgut obliterating usually by 5-7th week of gestation [2]. Aberrations in this normal involution results in a broad entity termed the Omphalomesenteric Duct Remnants (ODR). The most famous and often encountered component of this group is the Meckel's diverticulum, often diagnosed incidentally and serves to test even the shrewdest of minds to arrive at the diagnosis when presenting symptomatically. Hence considering its believed innocuous nature, active screening protocols have not been established and when incidentally encountered in laparotomies decisions are made on table with regards to their management [3].

Paralleling with the notion "change is the only constant", even this perceived innocuous entity can lead to life threatening scenarios as seen in our case where the Meckel's diverticulum was associated with a mesodiverticular band (Remnant of the vitelline artery) extending from the antimesenteric diverticular border to the root of the mesentery causing entrapment of small bowel loops culminating in gangrenous Intestinal obstruction. On extensive literature search,

mesodiverticular bands causing even fatal outcomes have been reported [4]. However, it was fortunate in our case that timely intervention saved the life of the patient. Apart from the extreme rarity of such a presentation depicted by the limited number of published cases depicted in Table 1, this article brings to light one fact that is left to the readers to arrive at an opinion. Is there a necessity to devise a new strategy to screen newborns for these ODR looking beyond their apparently innocuous nature considering their potential to cause possible complications like Gastrointestinal bleeding, Inflammation, perforation, cancer and rarely an acute life threatening presentation in patients like ours [5]. The author also understands that attempting such a study to analyze the feasibility and benefits of detecting ODR by screening would require careful planning and a good algorithmic approach considering low detection rates of ODRs in the current available investigational modality panel. As the famous saying goes "Life shrinks or expands in proportion to one's courage", this article hopes to evoke thoughts in the mind of the readers to probe for the possibility of such an unexplored aforementioned study which would go a long way in enriching the current available literature irrespective of the outcomes.

Table 1. Review of salient features of the reported cases and outcomes in patients of Mesodiverticular Bands associated with Meckel's Diverticulum

Reported cases of mesodiverticular bands and their presentations a brief review of literature			
Authors	Age/Sex	Presentation	Management
J.C Vork et al. j. forsciint [4]	48/Male	Abdominal Pain and vomiting x 2 days (Misdiagnosis)	Fatal Outcome
Kuru et al. Viszeralmedizin [5]	17/Male	AIO in emergency	Resection and Anastomosis
Sumer et al. Case Rep Med [6]	17/Male	AIO in emergency	Resection and Anastomosis
Yazgan C et al. BJR Case Reports [7]	35/Male	AIO in emergency	Resection and Anastomosis
Yagnik VD. Tzu Chi Med J [8]	14/Male	Gangrenous Bowel Obstruction	Resection and Anastomosis
Naveen N et al. Sch. J. App. Med. Sci. [9]	36/Male	Gangrenous Bowel Obstruction	Resection and Anastomosis
Heller et al. Pediatric and Developmental Pathology. [10]	9/Male	Abdominal Pain and vomiting x 2 days (Misdiagnosis)	Fatal Outcome
Sethi et al. Med J Armed Forces India. [11] (Description of 2 Cases)	18/Male	Gangrenous Bowel Obstruction	Resection and Anastomosis
	28/Male	Gangrenous Bowel Obstruction	Resection and Anastomosis
Present Case	28/Male	Gangrenous Bowel Obstruction	Resection of Gangrenous segment and exteriorization of healthy ends.

AIO – Acute Intestinal Obstruction.

4. CONCLUSION

Meckel's Diverticulum is an entity considered innocuous with treatment protocols being devised for management after an incidental diagnosis. But like how life's greatest ironies go by, the presence of the extremely rare mesodiverticular band with the innocuous Meckel diverticulum can lead to causation of devastating consequences and even death in rare occasions due to bowel obstruction. This article attempts to raise questions on the need for screening and identification of such Omphalomesenteric duct remnants and also wishes to alert the reading surgeon to consider this entity especially in young patients presenting with intestinal obstruction with no apparently identifiable cause or previous surgeries, as early suspicion and prompt treatment could prove to be lifesaving.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical approval is not required at our institution to publish an anonymous case report.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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