

Case study
Mesodiverticular Band of Meckel's Diverticulum Causing small bowel obstruction
A case report and review of the literature

Abstract

The Mesodiverticular band is an embryologic remnant of the vitelline artery which carries the arterial supply to the Meckel's Diverticulum. In the event of an error of involution a patent or non-patent arterial band persists and extends from the mesentery to the apex of the Meckel's Diverticulum. This creates a snare – like opening through which bowel loops may herniate and become obstructed.

We report a case of 50 years old male patient, who presented with strangulation and gangrene of a small bowel caused by Mesodiverticular band of the Meckel's Diverticulum. He presented with severe pain in abdomen distension of abdomen and vomiting. Emergency explorative laparotomy revealed gangrene of Meckel's Diverticulum along with adjacent ileal segment caused by Mesodiverticular band of Meckel's Diverticulum. The Mesodiverticular band was released from the ileal mesentery and the gangrenous ileal segment with Meckel's Diverticulum was resected and end to end ileo-ileal anastomosis was performed.

Keynotes

Mesodiverticular band, Meckel's Diverticulum, Gangrene, Strangulation, Intestinal obstruction, explorative laparotomy.

Introduction

Mesodiverticular band, is a rare congenital intestinal malformation. It originates from the embryonic remnant of vitelline artery and is usually associated with Meckel's Diverticulum. Persistent Mesodiverticular band may cause small bowel obstruction due to forming an internal hernia by trapping the loops of bowel. This abnormally is associated with high mortality. [1,2,3,4,5]

The lifetime risk of complication of Meckel's Diverticulum is estimated at 4% to 6% one of them is intestinal obstruction which is more common presentation among adults. As the preoperative diagnosis of intestinal obstruction which is caused by Mesodiverticular band is difficult. It is associated with high mortality and morbidity. Early diagnosis and immediate surgery will prevent the strangulation and bowel gangrene. Therefore, Mesodiverticular band which is one of the complications of Meckel's Diverticulum should be kept in mind. [5]

Small bowel obstruction due to Mesodiverticular band of Meckel's Diverticulum can be managed by laparoscopic surgery with the help of harmonic scalpel and endo-GIA linear stapler. Endo-staplers reduce the mortality/morbidity and hospitalization. [8,9]

Case report

A 50 years-old male patient presented with severe pain in abdomen, distension, vomiting and constipation since 3 days. Patient was admitted at Jatal hospital and research center on 18/02/2015. On physical examination, revealed abdominal distension, tenderness and guarding with exaggerated bowel sounds, suggestive of small bowel obstruction. Plain erect x-ray, ultrasonography and CT abdomen confirms the diagnosis of acute intestinal obstruction. Laboratory investigations revealed normal.

Emergency explorative laparotomy through mid-line incision was taken and after exploration of abdomen, 200-300 cc hemorrhagic fluid was aspirated. On inspecting the small bowel, there was strangulation of the ileal segment which was gangrenous along with gangrenous Meckel's Diverticulum. Meckel's Diverticulum measuring 7x3 cm gangrenous and tip of the Meckel's Diverticulum attached to Mesodiverticular band.

The Mesodiverticular band, which extended from the tip of the Meckel's Diverticulum to the ileal mesentery which was released with the help of electrical cautery and strangulated gangrenous loop of small bowel was released. (Fig A, B,C). Resection of small bowel gangrenous segment of 20 cm in length along with Mesodiverticular band of Meckel's Diverticulum was done. And healthy ileo-ileal segment anastomosis done by

hand sewn two layered end to end anastomosis was performed. (Fig D,E). The post-operative period was uneventful and patient discharged home after 8 days of surgery.

Discussion

Meckel's Diverticulum is the most common congenital anomaly of the gastrointestinal tract. The most common complication of Meckel's Diverticulum in pediatric population is lower gastrointestinal bleeding while the most common complication in adult is small bowel obstruction. Life time risk of complication in Meckel's Diverticulum represents of 4-6%. Rarely Meckel's Diverticulum is complicated by a Mesodiverticular band, which is believed to be a remnant of vitelline artery. When it causes intestinal obstruction and it is associated with high mortality. [1,2,3,4,5]

There were various mechanisms by which it can causes intestinal obstruction.

1. Volvulus of small intestine around a fibrous band extending from Meckel's Diverticulum to the umbilicus.
2. Intussusception due to inverted Meckel's Diverticulum causing ileo-ileal or ileo-colic intussusception.
3. Littre's hernia – incarceration of the Meckel's Diverticulum in the hernia.
4. Mesodiverticular band of Meckel's Diverticulum causing internal hernia and strangulation of small bowel.
5. Stricture secondary to chronic diverticulitis.
6. Enterolith
7. Tumors [1,2,4,5,11]

Less frequently, we may encounter an axial torsion of Meckel's Diverticulum and segmental volvulus small bowel volvulus secondary to axial torsion of ileum or small bowel obstruction due to ileal compression by the band associated with axial torsion of Meckel's Diverticulum. [7,11]

Recently laparoscopy has been tried as useful diagnostic and therapeutic tool for a patient with small bowel obstruction due to Mesodiverticular band. [8,9]

Systematic review of Mesodiverticular band.

Search strategy.

A systematic search in PubMed was performed on April 1, 2021 with time frame 1950 to 2021. The text terms in the or abstract "Mesodiverticular band", "Vitelline band" and vitelline artery remnants was included. The work has been reported in line with PRISMA arteria and in compliance with AMSTAR2 .

We included 20 cases of Mesodiverticular band in the review of literature. The patients were aged 18-75 years. Male: Female ratio was 3:1. The main clinical presentation were small bowel obstruction followed by hemoperitoneam. Small bowel obstruction was reported in 15 patients, 5 of them had strangulated small bowel, 3 with gangrene of Meckel's Diverticulum and 1 with an obstructed umbilical hernia. Hemoperitoneam was reported in 4 patients and one patient have a ruptured aneurysmal of vitelline artery which was patient artery. One death reported was diagnosed on postmortem. This study has some limitations because of small number a reported cases and this anomaly is very rare. [7]

Conclusion

Mesodiverticular band of Meckel's Diverticulum causing small bowel obstruction in adults in rare case. Preoperative diagnosis is challenging due to rarity of the condition. Early surgery is important to prevent strangulation and gangrene of the bowel. Recently role of laparoscopy surgery in useful as diagnostic and therapeutic tool to manages the cases of small bowel obstruction due to Mesodiverticular band of Meckel's Diverticulum and reduces hospitalization.

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