



# Giant Meckel's Diverticulum Causing Small bowel Obstruction : Series of 5 Cases

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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**Case Study**

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## **ABSTRACT**

Meckel's Diverticulum size more than 5 cm are classified as Giant Meckel's Diverticulum. They are relatively rare and may be more prone complications especially for obstruction. 90% of Meckel's Diverticulum ranges in size from 1-10 cm. It is estimated that's as 4-9% cases manifest complications and obstruction is the most common presenting symptom in adults. Large size and length of giant Meckel's Diverticulum are predisposing to obstruction. More over diverticulitis, torsion and volvulus are more common complication in longer Meckel's Diverticulum with narrow base are more prone to axial torsion of giant Meckel's Diverticulum, whereas short and wide base giant Meckel's Diverticulum may promote foreign body entrapment. A revision of English literature and PubMed database shows a total 28 reported cases of giant Meckel's Diverticulum in adults. Herein we report five rare cases of giant Meckel's Diverticulum and its clinical presentation. Out of five giant Meckel's Diverticulum, three cases presented with obstruction, one case presented with

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diverticulitis and another case of axial torsion of giant Meckel's Diverticulum with small bowel obstruction in adults. All are successfully managed by explorative laparotomy, surgical resection and end to end anastomosis done.

**Keywords:** Giant Meckel's diverticulum; small bowel obstruction; resection and anastomosis.

## 1. INTRODUCTION

A Meckel's Diverticulum over 5 cm long is classified as a giant Meckel's Diverticulum(GMD). The reported rate of complication is 4-16%. In pediatric patient's lower gastrointestinal bleeding and obstruction are the common complication while in adults, intestinal obstruction and diverticulitis is the most frequent clinical presentation, mainly intestinal obstruction, volvulus and rarely due to diverticulitis, axial torsion, Mesodiverticular band with strangulation and litre's hernia [1,2,3].

There is complication of this variant of Meckel's Diverticulum that are directly related to its size and length of Meckel's Diverticulum, predisposes to small bowel obstruction. Small intestine volvulus due to giant Meckel's Diverticulum is rare and is defined by the twist of the small bowel around its vascular axis and requires a timely management to reduce the high mortality and morbidity [4,5].

Diverticulitis is 10-20% cases present itself as an acute abdominal pain and can lead to perforation and subsequent peritonitis and it may mimic acute appendicitis clinically. It can be results of acid secretion from ectopic gastric and pancreatic tissue, causing inflammation of the adjacent ileal mucosa or diverticulitis cause by entroliths. Therefore, a segmental resection is recommended after palpation, which includes excision of ectopic tissue. We present a very unusual case of giant Meckel's Diverticulum with axial torsion causing small bowel obstruction and requires emergency surgical resection [1,4,6].

## 2. PATIENTS AND METHODS

The retrospective study of giant Meckel's diverticulum at our center from 01<sup>st</sup> January 1995 to 1<sup>st</sup> January 2023, we noticed total 8 patients of giant Meckel's diverticulum, of which two patients were adolescent and 6 were adults.

### 2.1 Objective

We study the giant Meckel's diverticulum and its various clinical presentations.

## 3. RESULTS

The majority of the patients in our study were six males and two females. The mean age was 25 years. The most common presentation was acute intestinal obstruction, severe abdominal pain and vomiting. The most common intraoperative findings were intestinal obstruction and second most clinical presentation was diverticulitis.

The length of giant Meckel's diverticulum was ranging from 6 cm to 15 cm and width of 3-12 cm. The most common histopathological findings were acute Meckel's diverticulitis with two patients having ectopic gastric tissue.

All patients were treated by explorative laparotomy followed by segmental resection of small bowel along with giant Meckel's diverticulum and end to end anastomosis [7-10].

## 4. DISCUSSION

Giant Meckel's Diverticulum is relatively rare. The longest giant Meckel's Diverticulum reported have been 100 cm long, in adult. Case of giant Meckel's Diverticulum causing small bowel obstruction is the most frequent complication in 38-40% patients. Several case reports of Meckel's Diverticulum related obstruction have described strangulation caused by an adherent diverticulum. Many cases, may have resulted from looping and twisting of gut in upon itself, forming a volvulus and small bowel obstruction. The diverticulum large in diameter, long in length predisposes to small bowel obstruction. Thus, an elongated variant with narrow base is more likely to result in torsion, where as a short & wide base diverticulum may present for foreign body entrapment and causing diverticulitis, perforation and peritonitis [1,2,3,4,5].

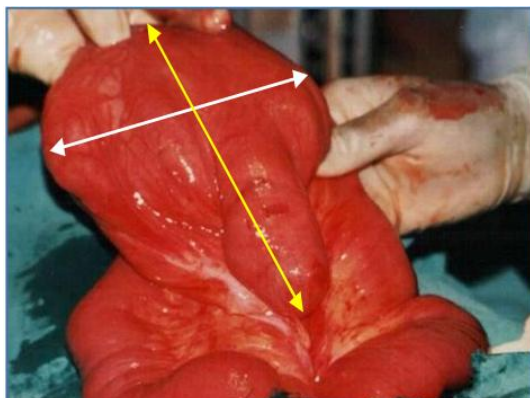
Primary or secondary small bowel volvulus is a rare disease that can result in torsion of the small bowel, As the symptoms progress, patient develop gangrene and perforation due to intestinal ischemia. Therefore, early diagnosis and treatment are the key to prevent intestinal gangrene and perforation [1,2].

Laparotomy is recommended in emergency situations, especially when the Meckel's Diverticulum is accompanied by intestinal obstruction. Resection of Meckel's Diverticulum can be performed either laparoscopically or through an open explorative laparotomy. Small bowel resection is preferred when there is a palpable abnormal tissue in the diverticulum or when the diverticulum is short and has a broad base. In these conditions small bowel resection along with Meckel's Diverticulum with the ectopic tissue is the ideal resection and end to end anastomosis [1,2,3,4].

#### 4.1 Case 1 – Giant Meckel's Diverticulum

A 25-year-old male patient admitted to our center in 1998, with complaints of severe pain in the abdomen, distension of the abdomen & vomiting over the last 24 hours. On physical examination, the patient's abdomen was remarkably distended, plain x-ray abdomen showing multiple air-fluid levels suggestive of intestinal obstruction. All laboratory reports were normal and the patient was hemodynamically stable.

An emergency laparotomy was performed, showing dilation of the small bowel segment and a giant Meckel's Diverticulum, 12 cm wide base and 15 cm long, at the antimesenteric border of the small bowel located in the pelvis due to the Meckel's Diverticulum's excessively large size and high volume of intestinal content, leading to sagging into the pelvic cavity. So we performed total excision of Meckel's Diverticulum along with a segment of small bowel and end-to-end anastomosis. Histopathology report showing diverticulitis without gastric or pancreatic tissue. Post-operative patient recovery was good and discharged home on 8<sup>th</sup> postoperative day. (Case 1 Figure No. a,b) [11,12].



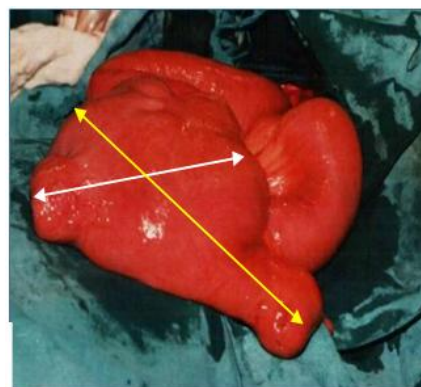
**Case 1 Fig-a Intra operative photographs a-Showing - Giant MD of size 12x15 cm**

#### 4.2 Case 2

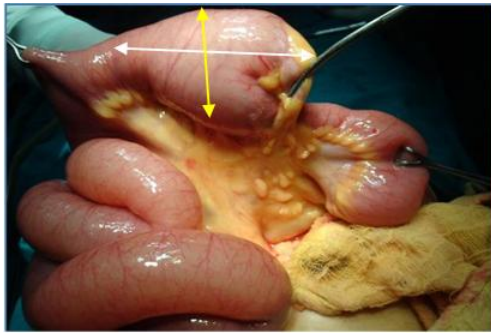
A 21-year-old boy was admitted to our center in 2000, with complaints of severe abdominal pain, vomiting, distension, and constipation for 2 days. All laboratory investigations were normal, plain x-ray abdomen evidence of multiple air-fluid levels, which is suggestive of small bowel obstruction. We performed emergency explorative laparotomy, which revealed a dilated proximal small bowel loop and a giant Meckel's Diverticulum, 8x4 cm, causing small bowel obstruction. So we performed small bowel resection along with the giant Meckel's Diverticulum and anastomosis. Histopathology report shows diverticulitis and not showing any ectopic tissue. Post-operative recovery was good & discharge patient at home on 8<sup>th</sup> postoperative day. (Case 2 Figure No. a,b).

#### 4.3 Case 3

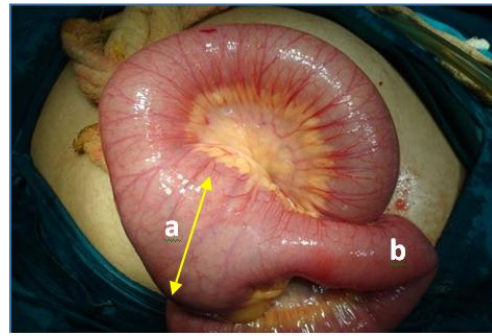
A 25-year-old female admitted to our center in 2001 with complaints of abdominal pain, vomiting, distension of the abdomen and constipation for 2 days. All laboratory investigations were normal and plain x-ray abdomen shows multiple air-fluid levels, representing small bowel obstruction. Emergency explorative laparotomy done through a mid-line incision, shows small bowel dilation and there was a giant Meckel's Diverticulum, 8x4 cm, causing small bowel obstruction. So we performed small bowel segmental resection along with Meckel's Diverticulum and end-to-end anastomosis. Histopathology shows diverticulitis with no ectopic tissue. Post-operative recovery was uneventful and discharge on 8<sup>th</sup> postoperative day. (Case 3 Figure No. a,b).



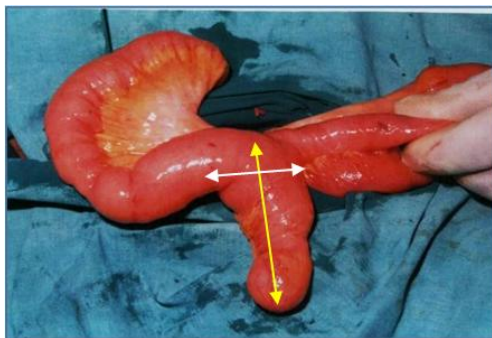
**Case 1 Fig-b Intra operative photographs a-Showing - Small bowel obstruction Giant MD**



**Case 2 Fig-a Intra operative photographs Showing - Giant MD of size 8x4 cm**



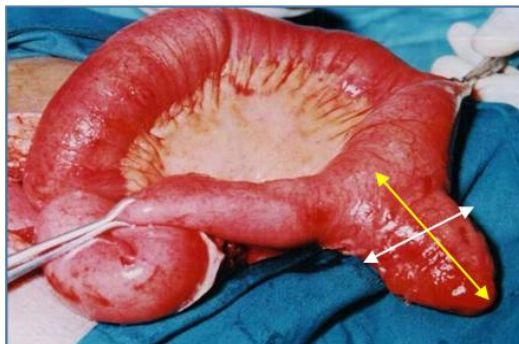
**Case 2 Fig-b Intra operative photographs**



**Case 3 Fig-a Intra operative photographs Showing - Giant MD of size 8x4 cm**



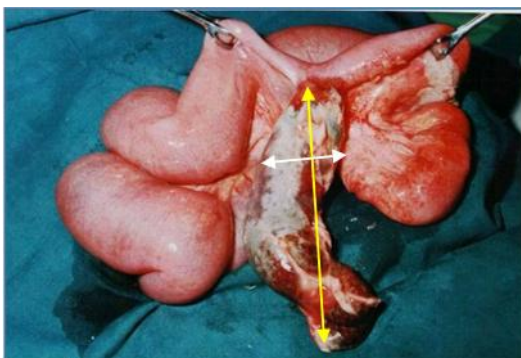
**Case 3 Fig-b Intra operative photographs a- Showing Giant MD. b- Small bowel obstruction**



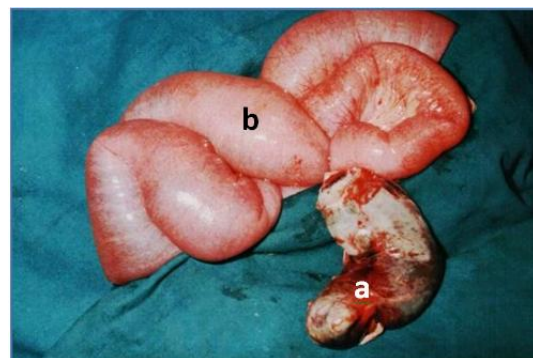
**Case 4 Fig-a Intra operative photographs Showing - Giant MD of size 6x4 cm**



**Case 4 Fig-b Intra operative photographs Showing - Small bowel obstruction Giant MD**



**Case 5 Fig-a Intra operative photographs**



**Case 5 Fig-b Intra operative photographs**

#### 4.4 Case No. 4

A 32 years male patient was admitted in our center, in 2003, with complaints of severe abdomen pain, distension of abdomen and fever last 4 days. The laboratory blood test total leukocytes count was 21,000 cmm. Physical examination shows tenderness in lower abdomen, guarding and rigidity was present. Abdominal x-ray shows signs of small bowel obstruction. Emergency laparotomy was performed shows dilated small bowel loops and a giant Meckel's Diverticulum size 6x4 cm, was inflamed, there was no perforation and peritonitis. So we performed segmental small bowel resection along with Meckel's Diverticulum. Histopathology report was acute diverticulitis with no ectopic tissue. On 8<sup>th</sup> postoperative day patient was discharged. (Case 4 Figure No. a,b).

#### 4.5 Case No. 5

A 25 years-old male patient with complaints of severe abdominal pain, distension of abdomen and constipation of 3 days. Physical examination, patient was hemodynamically stable. Patient was admitted at our center in the year 2002. Abdomen plain X-ray showing acute small bowel obstruction with multiple fluid levels. On ultrasonography and CT abdomen confirmed the diagnosis of acute intestinal obstruction. Therefore, an emergency explorative laparotomy was performed, using a vertical midline incision and revealed 500 ml serosanguineous fluid in the peritoneal cavity with distended small bowel loops, there was a gangrenous giant Meckel's Diverticulum.

Intraoperatively a twisted narrow base of giant Meckel's Diverticulum of size 12x4 cm with gangrene. Giant Meckel's Diverticulum was axially torted, which caused small bowel obstruction. The twisted & gangrenous Meckel's Diverticulum was resected along with 5 cm of ileum proximal & distal to its base and end to end anastomosis using 2.0 vicryl suture was made to reestablished the continuity of small intestine. A through peritoneal wash was done followed by the insertion of pelvic drain. Post-operative recovery was uncomplicated and patient was discharged on the 8th post-operative day. (Case 5 Figure No. a,b)

#### 5. CONCLUSION

A giant Meckel's Diverticulum is an extremely rare condition, these diverticula are associated

with more complications, presenting a higher risk of torsion, volvulus or intestinal obstruction. Emergency laparotomy is recommended, especially when the giant Meckel's Diverticulum is accompanied by intestinal obstruction and segmental resection of small bowel along with Meckel's Diverticulum and end to end anastomosis performed.

#### CONSENT

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

#### ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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