Casestudy

GiantMeckel's DiverticulumCausingSmallbowelobstruction–Series of 5Cases

Abstract

Meckel's Diverticulum size more than 5 cm are classified as Giant Meckel'sDiverticulum. Theyare relativelyrare and maybemorepronecomplicationsespeciallyforobstruction.90%ofMeckel'sDiverticulumrangesinsizefrom1-10 cm.Itisestimated that's as 4-9 % cases manifest complications and obstruction is the most common presentingsymptom in adults. Large size and length of giant Meckel's Diverticulum are predisposing toobstruction. More over diverticulitis, torsion and volvulus are more common complication inlonger Meckel's Diverticulum with narrow base are more prone to axial torsion of giantMeckel's Diverticulum, whereas short and wide base giant Meckel's Diverticulum maypromote foreign body entrapment. A revision of English literature and PubMed databaseshowsatotal28 reportedcasesofgiant Meckel'sDiverticuluminadults.

Herein we report five rare cases of giant Meckel's Diverticulum and its clinicalpresentation. Out of five giant Meckel's Diverticulum, three cases presented with obstruction,one case presented with diverticulitis and another case of axial torsion of giant Meckel'sDiverticulum with small bowel obstruction in adults. All are successfully managed byexplorativelaparotomy, surgicalresection andendtoend anastomosis done.

Keywords

GiantMeckel's Diverticulum,Smallbowelobstruction,Resectionandanastomosis

Introduction

A Meckel's Diverticulum over 5 cm long is classified as a giant Meckel'sDiverticulum(GMD).Thereportedrateofcomplicationis4-16%.Inpediatric patient'slower gastrointestinal bleeding and obstruction are the common complication while in adults,intestinal obstruction and diverticulitis is the most frequent clinical presentation, mainlyintestinal obstruction, volvulus and rarely due to diverticulitis, axial torsion, Mesodiverticularbandwithstrangulation and littre's hernia.[1,2,3]

There is complication of this variant of Meckel's Diverticulum that are directly related toits size and length of Meckel's Diverticulum, predisposes to small bowel obstruction. Smallintestine volvulusdue togiantMeckel'sDiverticulumisrareandisdefinedbythetwistofthesmall bowelaround itsvascularaxis andrequires atimelymanagement toreducethehighmortalityandmorbidity.[4,5]

Diverticulitis is 10-20% cases present itself as an acute abdominal pain and can lead toperforation and subsequent peritonitis and it may mimic acute appendicitis clinically. It canbe results of acid secretion from ectopic gastric and pancreatic tissue, causing inflammationoftheadjacent ilealmucosaor diverticulitiscause byentroliths.Therefore,asegmental

resection is recommended after palpation, which includes excision of ectopic tissue. Wepresent a very unusual case of giant Meckel's Diverticulum with axial torsion causing smallbowelobstruction and requires emergencysurgicalresection.[1,4,6]

Patients and Methods

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

Objective

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

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.

Discussion

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

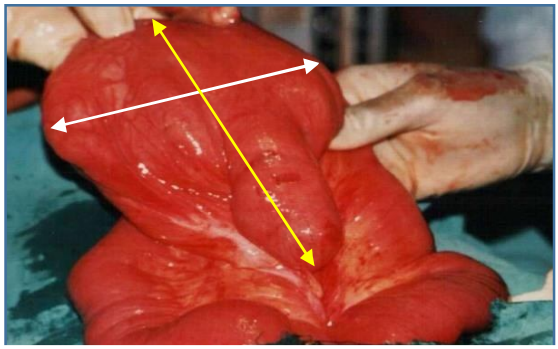
Primary or secondary small bowel volvulus is a rare disease that can result in torsion ofthe small bowel, As the symptoms progress, patient develop gangrene and perforation due tointestinal ischemia. Therefore, early diagnosis and treatment are the key to prevent intestinalgangrene and perforation. [1,2]

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

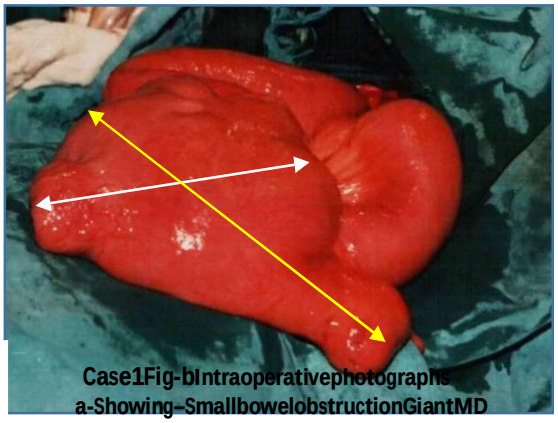
Case1–GiantMeckel'sDiverticulum

A 25-year-old male patient admitted on our center in 1998, with complaints of Severepain in abdomen, distension of abdomen & vomiting over the last 24 hours on physicalexamination patient's abdomen was remarkably distended, plain x-ray abdomen showingmultipleairfluid levelssayofintestinal obstruction.All laboratoryreports werenormalandpatientwas hemodynamicallystable.

An emergency laparotomy was performed shows dilation of small bowel segment andhaving a giant Meckel's Diverticulum size 12 cm wide base and length of 15 cm a theantimesenteric border of the small bowel located in pelvis due to the Meckel's Diverticulumexcessively large size and high volume intestinal content leading to sagging in to the pelviccavity. So we performed total excision of Meckel's Diverticulum along with segment ofsmall bowel and end to end anastomosis done. Histopathology report showing diverticulitiswithout gastric or pancreatic tissue. Post-operative patient recovery was good and dischargedhomeon 8thpostoperativeday. (Case1FigureNo. a,b)



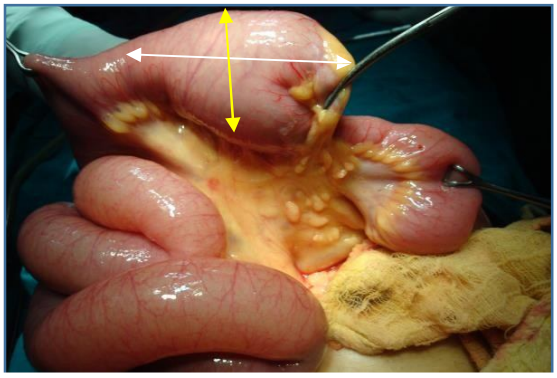
Case1Fig-aIntraoperativephotographs a-Showing-GiantMDofsize 12x15cm



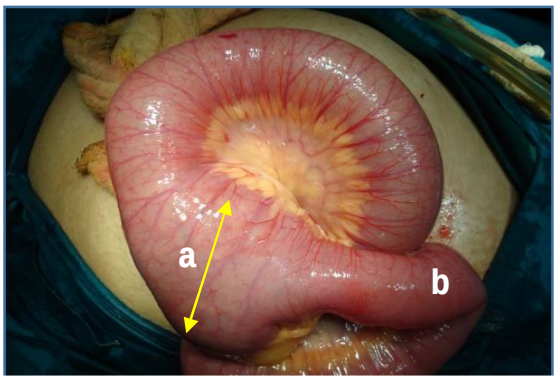
Case1Fig-bIntraoperativephotographs a-Showing–SmallbowelobstructionGiantMD

Case2

A 21 years old boy was admitted in our center in 2000, with complains of severeabdominalpain,vomitingdistensionandconstipationfor2days.Alllaboratoryinvestigation was normal plain –x-ray abdomen evidence of multiple air-fluid levels, which suggestive ofsmall bowel obstruction. We performed emergency explorative laparotomy which revealeddilated proximal small bowel loop and giant Meckel's Diverticulum size 8x4 cm, causingsmall bowel obstruction. So we performed small bowel resection along with giant Meckel'sDiverticulum and anastomosis. Histopathology report shows diverticulitis and not showingany ectopic tissue. Post-operative recovery was good & discharge patient at home an 8thpostoperativeday. (Case2 FigureNo.a,b)



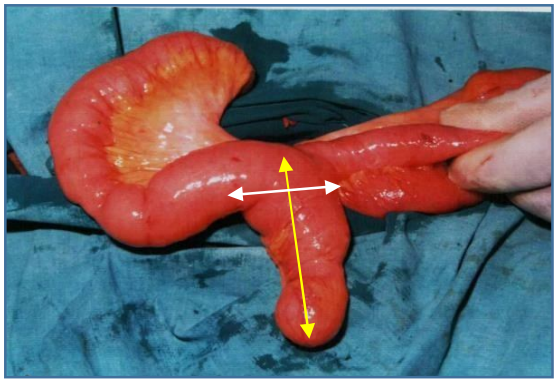
Case2Fig-aIntraoperativephotographs Showing-GiantMDofsize8x4cm



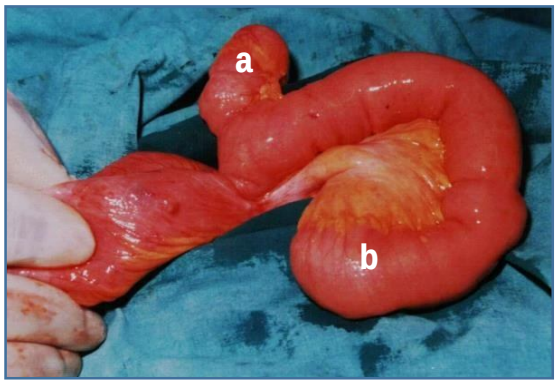
Case2Fig-bIntraoperativephotographs a-ShowingGiantMD.b-Smallboweltwist

Case3

A 25 years old female admitted in our center in 2001 with complains of abdominal pain,vomiting distension of abdomen and constipation last for 2 days. All laboratory investigationwas normal and plain x-ray abdomen shows multiple air-fluid levels represents small bowelobstruction. Emergency explorative laparotomy done through mid-line incision, shows mallbowel dilation and there was a giant Meckel's Diverticulum size 8x4 cm causing small bowelobstruction. So we performed small bowel segmental resection along with Meckel'sDiverticulum and end to end anastomosis. Histopathology shows diverticulitis with noectopic tissue. Post-operative recovery was uneventful and discharge on 8th post-operativeday.(Case3FigureNo.a,b)



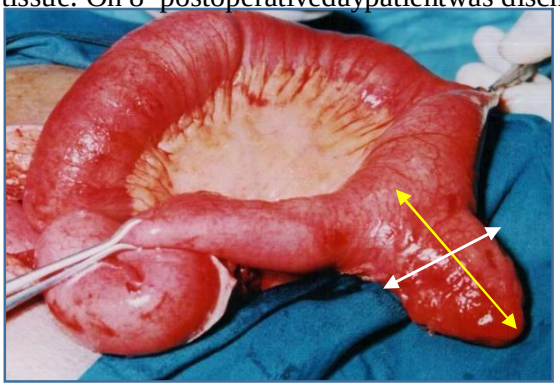
Case 3 Fig-a Intra operative photographsShowing - GiantMDofsize 8x4cm



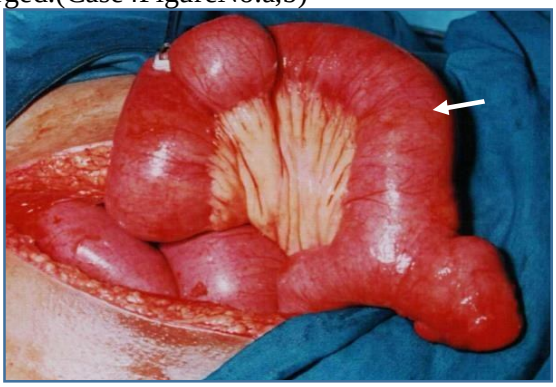
Case3Fig-bIntraoperativephotographs a-ShowingGiantMD.b-Smallbowelobstruction

CaseNo. 4

A 32 years male patient was admitted in our center, in 2003, with complaints of severeabdomen pain, distension of abdomen and fever last 4 days. The laboratory blood test totalleukocytes count was 21,000 cmm. Physical examination shows tenderness in lowerabdomen, guarding and rigidity was present. Abdominal x-ray shows signs of small bowelobstruction. Emergency laparotomy was performed shows dilated small bowel loops and agiant Meckel's Diverticulum size 6x4 cm, was inflamed, there was no perforation andperitonitis. So we performed segmental small bowel resection along with Meckel'sDiverticulum. Histopathology report was acute diverticulitis with no ectopic tissue. On 8thpostoperativedaypatientwas discharged.(Case4FigureNo.a,b)



Case 4 Fig-a Intra operative photographsShowing - GiantMDofsize6x4 cm



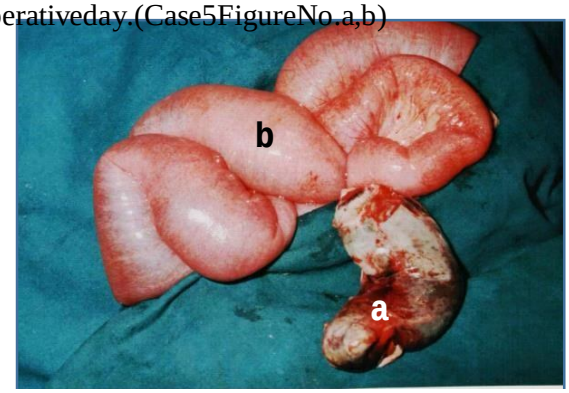
Case 4 Fig-b Intra operative photographsShowing– SmallbowelobstructionGiantMD

CaseNo. 5

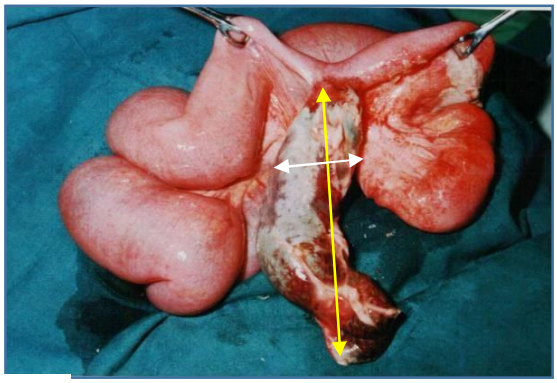
A 25 years-old male patient with complaints of severe abdominal pain, distension ofabdomen and constipation of 3 days. Physical examination, patient was hemodynamicallystable. Patient was admitted at our center in the year 2002. Abdomen plain X-ray showingacute small bowel obstruction with multiple fluid levels. On ultrasonography and CTabdomen confirmed the diagnosis of acute intestinal obstruction. Therefore, an emergencyexplorativelaparotomywasperformed, usingaverticalmidline incisionandrevealed500 ml

serosanguineous fluid in the peritoneal cavity with distended small bowel loops, there was agangrenousgiant Meckel's Diverticulum.

Intraoperatively a twisted narrow base of giant Meckel's Diverticulum of size 12x4 cmwith gangrene. Giant Meckel's Diverticulum was axially torted, which caused small bowelobstruction.Thetwisted&gangrenousMeckel's Diverticulumwasresectedalongwith5cmof ileum proximal & distal to its base and end to end anastomosis using 2.0 vicryl suture wasmade to reestablished the continuity of small intestine. A through peritoneal wash was donefollowed by the insertion of pelvic drain. Post-operative recovery was uncomplicated andpatientwas discharged onthe 8th post-operativeday.(Case5FigureNo.a,b)



Case5Fig-bIntraoperativephotographs Showing–a-AxistorsionofgiantMD.b-Smallbowelobstruction



Case5Fig-aIntraoperativephotographs Showing-GiantMDofsize 12x4cm

Conclusion

A giant Meckel's Diverticulum is an extremely rare condition, these diverticula areassociated with more complications, presenting a higher risk of torsion, volvulus or intestinalobstruction. Emergency laparotomy is recommended, especially when the giant Meckel'sDiverticulum is accompanied by intestinal obstruction and segmental resection of smallbowelalongwith Meckel'sDiverticulumand endto end anastomosisperformed.

References

1. Akbulut S, Yagmur Y. Giant Meckel's diverticulum: An exceptional cause ofintestinal obstruction. World J Gastrointest Surg. 2014 Mar 27;6(3):47-50. doi:10.4240/wjgs.v6.i3.47.PMID: 24672650; PMCID: PMC3964415.

2. Rout, Alexandra MBChB*; Morreau, Phil FRACS*; Bird, Helen FRANZCR†;Roberts, Amin FRACP‡,§. Giant Meckel's Diverticulum in a 9-Year-Old Boy: AnUnusual Presentation With Isolated Faltering Growth. JPGN Reports 3(3):p e208,August2022.|DOI: 10.1097/PG9.0000000000000208

3. Andreas Minh Luua Kirsten MeureraTorstenHerzogaWaldemarUhla AndreaTannapfelb Chris Braumann, Small Bowel Obstruction due to a Giant Meckel'sDiverticulum,ViscMed2016;32:434–436 DOI:10.1159/000450589

4. Lei Ying, Jeong-moh John Yahng, A rare case of Meckel's diverticulum causingsmall bowel obstruction in a 50-year-old manhttps://doi.org/10.1016/j.ijscr.2020.01.047

5. Feinberg L, Morris C, Srinivasan A, Bhattachyra P, Charan K, Zaman S. An AtypicalPresentation of Giant Meckel's Diverticulitis: A Case Report. J GastroenterolHepatolEndosc. 2019; 4(3): 1065.

6. Alfredo Vivas Lopez, Daniel Pastor Altaba, Oana-AnisaNutu, Alberto MarcacuzcoQuinto Servicio de Cirugía General,Giant Meckel Diverticulum: A Rare Cause ofIntestinalObstruction, DOI:10.1016/j.cireng.2019.03.010

7. Kumar MSK, Vijayalakshmi V, Girieasen SM, Deepika S, Kannan R. Torsion ofgiant meckel's diverticulum causing acute small bowel obstruction. IntSurg J2022;9:718-21

8. Marc Weijie Ong1, MBBS, Ker Kan Tan1, MMed, FRCSE, Richard Sim1, MBBS,FRCSE, Laparoscopic resection of a huge gangrenous Meckel's diverticulum in anadult,SingaporeMed J2013;54(4): e83-e84 doi:10.11622/smedj.2013087

9. Nunes QM, Hotouras A, Tiwari S, Sheth A. Gangrene due to axial torsion of a GiantMeckel's Diverticulum containing multiple stones in the lumen: a case report. Cases J2009; 2:7141.

10. Dumper J, Mackenzie S, Mitchell P, et al. Complications of Meckel's diverticula inadults.Can JSurg2006;49:356-7.

11. Feinberg L, Morris C, Srinivasan A, Bhattachyra P, Charan K, Zaman S. An AtypicalPresentation of Giant Meckel's Diverticulitis: A Case Report. J GastroenterolHepatolEndosc. 2019; 4(3): 1065.

12. Ren B, Jia X, Meng X, Li L: Intestinal obstruction due to axial torsion of a giant Meckel's diverticulum: a case report. Int J Colorectal Dis 2015;30:1133-1134.