Meckel's Diverticulum Disease's Conferral A Case series of 7 cases Meckel's Diverticulum disease at a rural tertiary care centre

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ABSTRACT: Background-Meckel's Diverticulum is a true diverticulum which contains all layer of small bowel wall, congenital remnant of omphalomesenteric duct, caused by a failure of normal regression of the Vitelline duct that occurs during weeks of 5 to 7 of gestation. Using the figure of 2 per cent incidence of Meckel's diverticulum, we calculated that a Meckel's diverticulum has a 4.2 per cent likelihood of causing disease during a lifetime, decreasing to zero with old age. [1] It is generally asymptomatic throughout life but may result in life threatening conditions like perforation, obstruction, haemorrhage, acute diverticulitis.

Objective – To study the clinical picture, investigations and outcome of Meckel's diverticulum. Materials and Methods-In our series we retrospectively studied about the seven cases of Meckel's diverticulum with varied presentations during a span of 2 years in our institution using the medical records of the patients.

Results-Three cases presented as intestinal obstruction, one with perforation, one case of incidental Meckel's diverticulum, one case of diverticulitis and one ruptured haemorrhagic Meckel's diverticulum .

Keywords – Meckel's diverticulum , Perforation , Obstruction , Acute Appendicitis , Diverticulitis , Mesodiverticular band.

INTRODUCTION

Meckel's diverticulum reported initially in 1598 by HILDANUA and then described in detail by Johann Friedrich Meckel in 1809, although such an abnormality had been mentioned quite early by Fabricius Hildamus in 1598 and in 1671 by Lavater (who did not recognize its embryological origin). However, it was not until almost 100 years later that the understanding of Meckel's diverticulum increased with the discovery of ectopic gastric mucosa by Salzer and associated ulceration of ileum by Deetz, located on the anti- mesenteric border of the ileum, 45 to 60 cm proximal to Ileo-caecal valve. An equal incidence found in Men and Women. Usually presents as a relatively wide mouther diverticulum measuring about 5 cm in length, diameter upto2 cm. Most common clinical presentation of Meckel's diverticulum is Gastro-intestinal bleeding which occurs in 25 to 50 %of patient .Another common presenting symptom of Meckel's Diverticulum is Intestinal Obstruction . Diverticulitis accounts for 10 to 20 % symptomatic presentation of Meckel's diverticulum, which is clinically indistinguishable from Appendicitis. Diverticulitis may lead to perforation and peritonitis. When the appendix is found to be normal during exploration of suspected Appendicitis , the distal ileum should be inspected for the presence of an inflamed Meckel's Diverticulum .More than 70 % of symptomatic patients have heterotrophic gastric mucosa , and another 5% have pancreatic tissue.

MATERIALS & METHODS

This is a retrospective descriptive study conducted in the department of surgery at Rural Medical College, Loni. Data was collected from the medical records in context to age, sex, clinical presentation, haematological, biochemical and radiological investigations, time of onset of disease and time of presentation to the hospital, operative management and post operative course. The histopathological reports confirming the tissue diagnosis of Meckel's Diverticulum. Data was analysed using appropriate methods.

Aims and objective –

To study the clinical picture, investigations and outcome of Meckel's diverticulum.

Case Profile –

For ease of compilation and to avoid duplication of clinical history and examination we preferred to present in tabulated form.

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case7
Age	**23 years**	**30 years**	**45 years**	**35 years**	**70 years**	**78 years**	**45 years**
Sex	**Male**	**Female**	**Female**	**Male**	**Male**	**Male**	**male**
Vitals	Temp – 101 *f Pulse – 102bpm Blood Pressure – 120 / 78 mm hg	Temp – 100*f Pulse – 100 bpm Blood pressure – 110/80 mm hg	Temp – 101*f Pulse – 99 bpm Blood pressure -	Temp –100 * f Pulse – 126 bpm Blood Pressure –	Temp – 98.6 * f Pulse – 130 bpm Blood Pressure – 90/60 mm hg	Temp – 99 *F Pulse – 98 bpm Blood pressure – 100/60 mm hg	Temp – 98.6 * F Pulse – 84 bpm

			130/82 mm hg	100 /70 mm hg			Blood pressure – 120/82 mm hg
Symptoms	Pain abdomen and vomiting episodes since past 12 hours	Acute onset pain abdomen associated with fever and vomiting episodes since past 2 days	Diffuse pain abdomen with Nausea and vomiting episodes since past 7 days	Acute pain abdomen associated with episodes with Malaena since past 10 days	Abdomen distended with hyperperistaltic bowel sounds Since past 5 days	Abdominal pain and distension and obstipation ,associated with Nausea and Vomiting since past 03 days	Abdominal pain, vomiting and obstipation since past 3 to 4 days .
Per abdominal findings	Soft , non distended , tenderness at Mac. Burney's point	Tenderness at right iliac fossa with mild diffuse tenderness with guarding .	Diffuse tenderness all over the abdomen with guarding and rigidity	Generalised Abdominal pain and distension	Generalised abdominal distension, with rigidity , with Sluggish bowel sounds .	Generalised distension with vague tenderness along with visible peristalsis was seen. No rigidity, metallic exaggerated bowel sounds present in lower abdominal quadrants	Abdominal distension, with mild Guarding. No rigidity. Bowel sounds diminished in all quadrants.
Ultrasonography	Acute appendicitis	Acute Appendicitis	Peritonitis	Acute diverticulitis	Acute small bowel obstruction	Acute small bowel obstruction.	Acute Bowel Obstruction .
Procedure	Open appendectomy	Open appendectomy	Exploratory Laparotomy	Exploratory Laparotomy	Exploratory Laparotomy	Exploratory Laparotomy with Ileo-ileal anastomosis	Exploratory Laparotomy with wedge Resection of Meckel's diverticulum and Ileo-illeal Anastomosis .
Operative findings	Wide mouthed Meckel's Diverticulum was incidental finding	Meckel's Diverticulum was traced tobe found with swollen base which may be the case of acute abdominal signs along with inflamed appendicitis	Meckel's Diverticulum with heavily oedematous wall with perforation	Wedge resection of Meckel's Diverticulum	adhesive band was seen in between meckel's diverticulum and bowel .Adhesiolysis with resection of meckel's diverticulum with resection of normal segment of small bowel was done.	Dilated illeal and Jejunal bowel loops with a small bowel diverticulum concerning for Meckel's diverticulum at 60 cm proximal to Illeo-caecal junction with adhesive band . Another band causing stricture at 15 cm proximally to Illeo-caecal junction	Stool impacted , inflammed , mildly edematous Meckel's Diverticulum
Histopatholical findings	Meckel's Diverticulum	Meckel's Diverticulum	Meckel's Diverticulum	Meckel's Diverticulum	Meckel's diverticulum	Meckel's diverticulum	Meckel's Diverticulum

Incidence	14.2 %	14.2 %	14.2 %	14.2%	42 %	42 %	42 %

Fig 1 – wedge resection of Meckel's diverticulum .

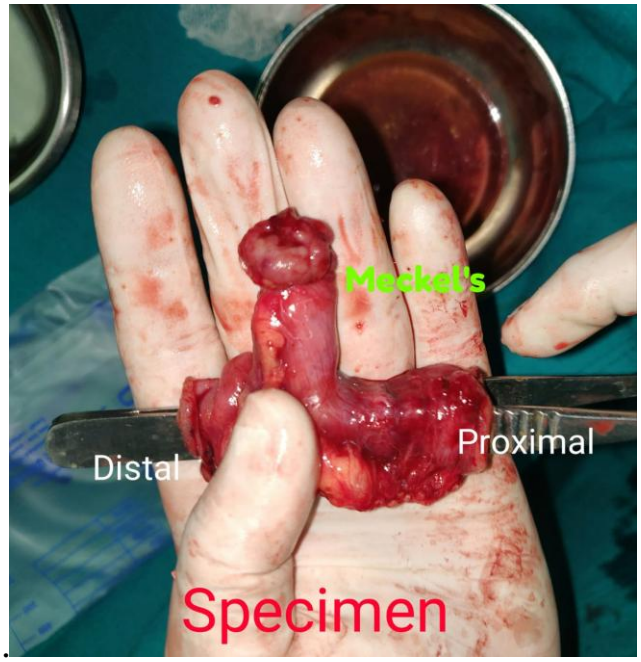

Fig 2- Excised specimen of inflamed meckel's diverticulum with connecting sinus till umbilicus .

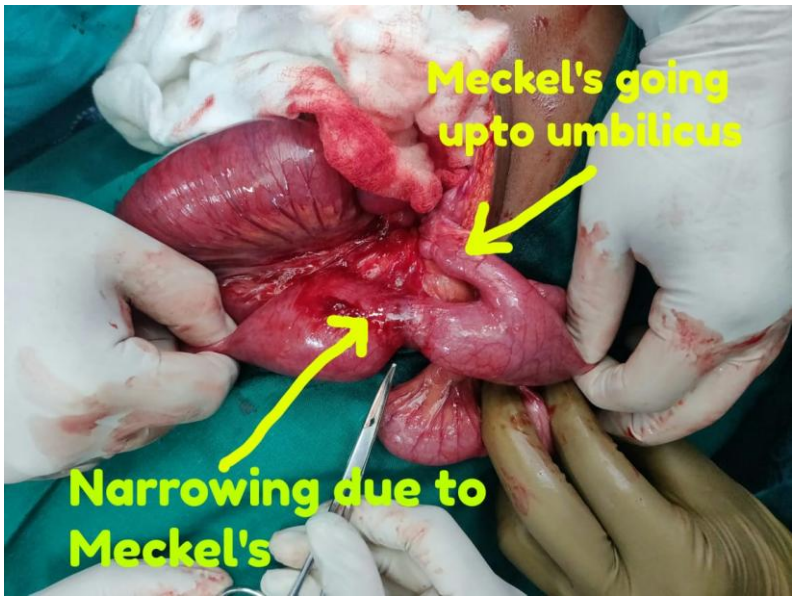

Fig 3 - Meckel's diverticulum causing intestinal obstruction

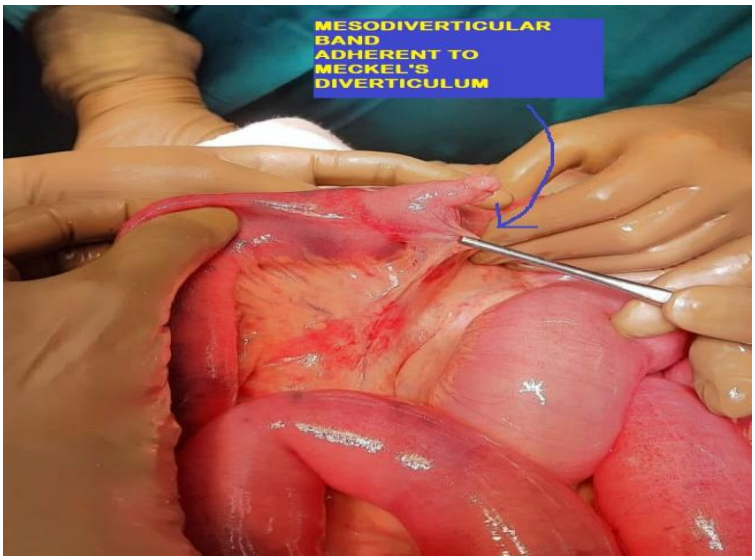

Fig 4 -Mesodiverticular band adherent to base and body of Meckel's diverticulum

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Fig 5 – excised specimen of Meckel's diverticulum .

Fig 6 - Meckel's diverticulum with perforated tip.

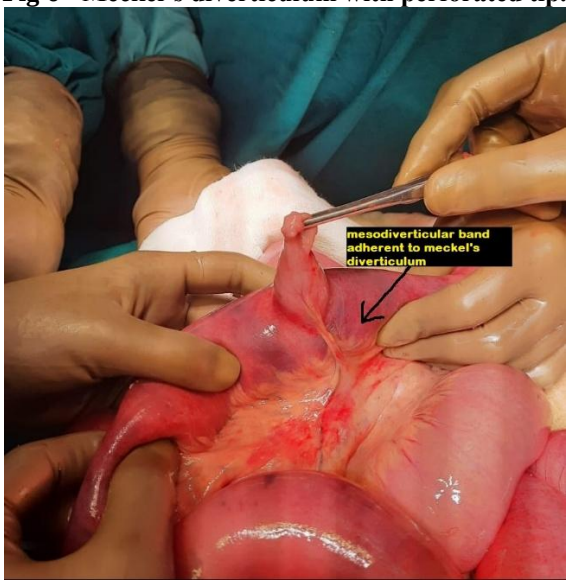

Fig 7 - Mesodiverticular band adherent to Meckel's diverticulum.

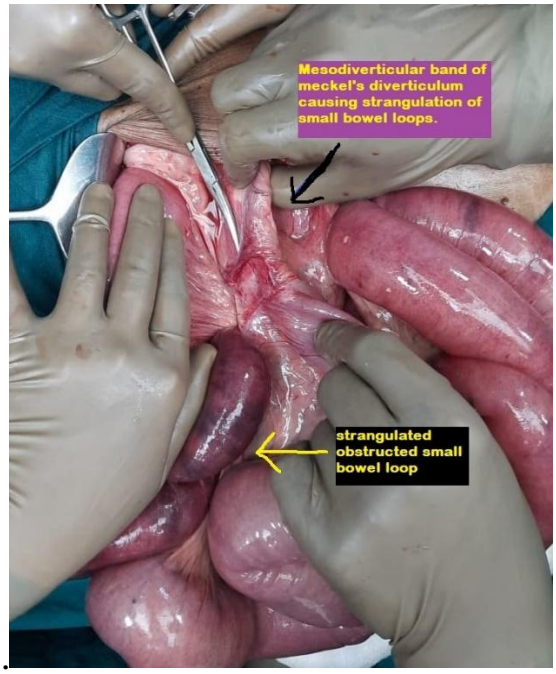

Fig 8 - Mesodiverticular band of meckel's diverticulum causing Internal herniation and strangulation of bowel loops .

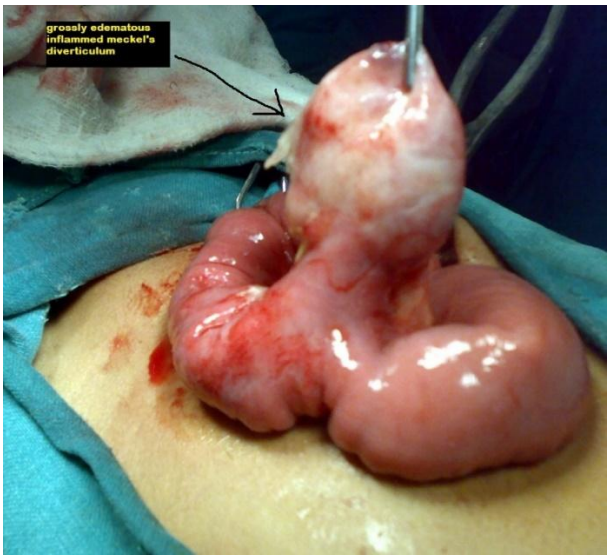

Fig 9 – Grossly edematous , inflammed meckel's diverticulum .

DISCUSSION -

Preoperative diagnosis of asymptomatic Meckel's diverticulum disease is quiet difficult , and the diverticulum is usually observed incidentally or during other diverse surgical interventions . "Rule of two" is characteristic for Meckel's diverticulum, which includes the prevalence in 2% of the population; it is usually diagnosed under the age of two; it is in two-inches size and 2 cm diameter, two feet proximal to the ileocaecal valve, twice frequent in men, and symptomatic in 2% of the patients.

This clinical case done in march 2021 - Intestinal obstruction and ischemia by necrotic annular Meckel's diverticulum: Case report and review of the literature - GiuseppeEvola[a]SebastianoCaramma describes a extremely rare necrotic annular Meckel's Diverticulum causing intestinal obstruction and small bowel ischemia on a 70 year male (2) . In our case series we came across a similar case of 70 year male presenting as acute intestinal obstruction case and intraoperative findings were suggestive of adhesive band seen in between meckel's diverticulum and bowel loops .

There was another case report February 2020, A rare case of Meckel's diverticulum causing small bowel obstruction in a 50-year-old man - Lei Ying* and Jeong-moh John Yahng

Observing a case of 50 year old male who presented with abdominal pain, distension and vomiting. Per abdomen examination revealed gaseous distension with guarding. Abdominal Imaging done confirmed small bowel obstruction. Laparotomy findings showed gangrenous Meckel's diverticulum and obstructed small bowel loops. (3) similarly in our study we found a case of 78 year male , coming with complains of Abdominal pain and distension and obstipation ,associated with Nausea and Vomitting since past 03 days , diagnosed as intestinal obstruction . Intra operative findings were dilated illeal and Jejunal bowel loops with a small bowel diverticulum concerning for Meckel's diverticulum at 60 cm proximal to Illeo-caecal junction with adhesive band . Another band causing stricture at 15 cm proximally to Illeo-caecal junction .

Intestinal hemorrhage caused by Meckel's diverticulum with ectopic gastric mucosa on polypoid lesion: a case report by Toshiyuki Irie, and Seiichi Shinji reported A 14-year-old girl experiencing passing tarry stool and syncope twice since October 2015. she was diagnosed as having hemorrhagic Meckel's diverticulum. [5] we came across a 35 year male Acute pain abdomen associated with episodes with Malaena since past 10 days , patient underwent laparotomy and hemorrhagic ulcerative meckel's diverticulum was seen and wedge resection was done for the same .

A case of an adult male patient presented with pain around the umbilical region which later shifted to the right iliac fossa. procedure to open and a grid iron incision was made in the right iliac fossa. The mass was found to be a huge Meckel's diverticulum with a wide base (about 12cm) adherent to the small bowel mesentery by its apex in the right iliac fossa causing a kink in the ileum. The appendix was also explored and found to be retroceacal in position. It appeared healthy without any signs of inflammation . [6] In our case series we came across two patients , a 23 year old male who presented as a classical case on appendicitis , and meckel's diverticulum was an incidental finding , another case happens to be a 30 year old female with symptoms of acute appendicitis , patient underwent open appendectomy and Meckel's Diverticulum was traced to be found with swollen base which may be the case of acute abdominal signs along with inflamed appendicitis .

CONCLUSION –

The clinical diagnosis of inflamed Meckel's diverticulum is rarely considered preoperatively in adult patients. This report highlights the fact that the differential diagnosis of Meckel's should always be kept in mind in cases suspected of acute appendicitis, and particularly in adults with symptoms of intestinal obstruction. [2] We consider this case series to be of interest to gain insight into the evaluation and management of Meckel's diverticulum disease presenting beyond pediatric age group..

Limitations -

1. Retrospective study .
2. Small case series .
3. No advanced investigations like angiography or isotope scans were done .
4. No special pathological staining was done .

Competing interests

The authors declare that they have no competing interests.

Sources of funding-

All the authors declare that this research didn't receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical approval –

Ethical approval has been exempted by our institution because this is a retrospective case series and no new studies or new techniques were carried out.

Declaration –

1. Identity of patients' is not revealed anywhere.
2. The sole purpose is for advancement of academics only.

Acknowledgement –

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References –

1. Soltero MJ, Bill AH. The natural history of Meckel's Diverticulum and its relation to incidental removal. A study of 202 cases of diseased Meckel's Diverticulum found in King County, Washington, over a fifteen year period. Am J Surg. 1976 Aug;132(2):168-73. doi: 10.1016/0002-9610(76)90043-x. PMID: 952346.
2. Evola G, Caramma S, Caruso G, Schillaci R, Reina C, Reina GA. Intestinal obstruction and ischemia by necrotic annular Meckel's diverticulum: Case report and review of the literature. Int J Surg Case Rep. 2021 May;82:105897. doi: 10.1016/j.ijscr.2021.105897. Epub 2021 Apr 20. PMID: 33895628; PMCID: PMC8099489.
3. Ying L, Yahng JJ. A rare case of Meckel's diverticulum causing small bowel obstruction in a 50-year-old man. Int J Surg Case Rep. 2020;68:107-110. doi: 10.1016/j.ijscr.2020.01.047. Epub 2020 Feb 6. PMID: 32143152; PMCID: PMC7056602.
4. KAYA, OSKAY; MORAN, MÜNEVVER; ÖZDEMİR, FATİH; and ÇETİNKUNAR, SÜLEYMAN (2008) "A Rare Cause of Intestinal Obstruction: Meckel´s Diverticulitis," *Turkish Journal of Medical Sciences*: Vol. 38: No. 3, Article 16. Available at: https://journals.tubitak.gov.tr/medical/vol38/iss3/16
5. Irie, T., Shinji, S., Arai, H. *et al.* Intestinal hemorrhage caused by Meckel's diverticulum with ectopic gastric mucosa on polypoid lesion: a case report. *surg case rep* **2,** 124 (2016). https://doi.org/10.1186/s40792-016-0252-4
6. TY - JOUR . AU - Chohan, Tahir AU - Tabook, Salem AU - Elmukashfi, Elsadig AU - Sakroon, Salem PY - 2010/01/01 T1 - Acute Appendicitis or…. is it Meckel's Diverticulitis? VL - 25 .DO - 10.5001/omj.2010.19 ,JO - Oman Medical Journal
7. Das PC, Rao PL, Radhakrishna K. Meckel's diverticulum in children. J Postgrad Med. 1992 Jan-Mar;38(1):19-20. PMID: 1512719.