

Meckel's diverticulum: Report of two cases and review of literature.

V Yagnik, J Desai, S Vyas

Citation

V Yagnik, J Desai, S Vyas. *Meckel's diverticulum: Report of two cases and review of literature.*. The Internet Journal of Surgery. 2009 Volume 22 Number 1.

Abstract

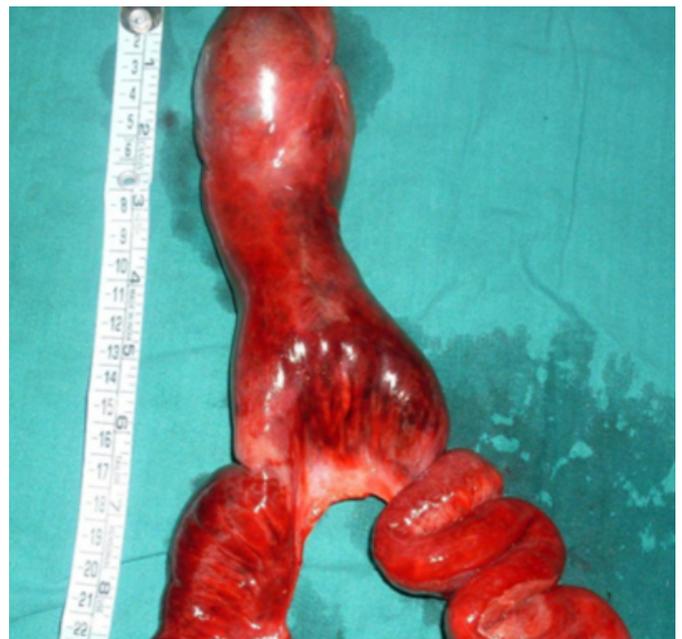
Meckel's diverticulum is located on the anti-mesenteric border of the ileum 2 feet proximal to the ileocecal junction with a length varying from 1-10cm. Approximately half of the Meckel's diverticula are lined by gastric mucosa. If symptomatic, it can present as a lower GI bleeding, intestinal obstruction or diverticulitis. High degree of suspicion is required for diagnosis of Meckel's diverticulum. Radio nucleotide scan is useful in presence of ectopic mucosa. Surgical treatment of Meckel's diverticulum includes either diverticulectomy or ileal resection.

CASE 1

A 13-year-old male patient admitted with the chief complaint of generalized abdominal pain and vomiting associated with no passing of stool since the last 2 days. On examination, signs of peritonitis were present, x-rays showed dilated bowel loops and the blood picture revealed a leucocytosis with left shift. It was decided to explore the belly. On exploration, a Meckel's diverticulum with a length of around 17cm was found, with inflammatory changes (figure 1). Resection and anastomosis was performed and the post-operative course was unremarkable.

Figure 1

Figure 1: Meckel's diverticulitis



CASE 2

A 7-year-old girl was presented with signs and symptoms of small bowel obstruction. We investigated and confirmed the diagnosis. On exploring the abdomen, we found a constricting band around a Meckel's diverticulum and we released the band. The Meckel's diverticulum with approximately 50cm of small bowel was gangrenous (figure 2). Resection and anastomosis was performed. The postoperative course was uneventful.

Figure 2

Figure 2: Gangrenous meckel's diverticulum



DISCUSSION

Failure of obliteration of the vitelline duct results in development of Meckel's diverticulum. It is named after Johann Meckel, who described it in detail in 1809¹. Meckel's diverticulum is located on the anti-mesenteric border of the ileum, 2 feet proximal to the ileocecal junction with a length varying from 1-10cm. The blood supply is derived from persistent vitelline vessels supplied from the SMA. Approximately half of the Meckel's diverticula are lined by gastric mucosa. From 80% to 85% of ectopic tissue in the diverticulum is gastric but ectopic tissue may be duodenal, colonic, or bile duct mucosa². Mostly, Meckel's diverticula are asymptomatic (figure 3).

Figure 3

Figure 3: Incidentally found Meckel's diverticulum



Life-time complication rate is around 4%. If symptomatic, Meckel's diverticulum can present as lower GI bleeding, intestinal obstruction or diverticulitis. Most symptomatic patients present in the first decade of life. Clinical presentation of Meckel's diverticulum in descending order of frequency is shown in TABLE 1.

Figure 4

TABLE 1: Clinical presentation of Meckel's diverticulum

Signs and symptoms	Frequency (%)
Lower GI bleeding	25 to 50%
Intestinal obstruction	30 to 35%
Diverticulitis	10 to 20%
Persistent umbilical fistula	5-10%
Neoplasm	1%

Figure 5

Table 2: Factors associated with higher risk of complications

Age <40yrs.
Male sex
>2cm length or with narrow neck
Heterotopic mucosa
Band

Lower GI bleeding is due to ulceration of the ectopic gastric mucosa in 95% of cases. Bleeding is often brisk and painless. Bleeding from Meckel's diverticulum is rare beyond the age of 30. Obstruction may be due to adhesion, intussusception, volvulus or Littre's hernia. Obstruction is the most common presenting symptom of Meckel's diverticulum in adults⁵. Littre's hernia is found in up to 5% of patients. Acute diverticulitis may be due to enterolith, obstruction of the opening of the diverticulum or ulceration with gastric heterotopias. Acute diverticulitis is difficult to differentiate from acute appendicitis and can lead to perforation and peritonitis. The presentation of chronic diverticulitis may mimic Crohn's disease of the ileum⁶.

Clinical features of Meckel's diverticulitis are virtually indistinguishable from appendicitis, and operation is both diagnostic and therapeutic. Meckel's diverticulum is a true diverticulum, possesses all three coats of the intestinal wall and has its own blood supply². According to Dr Charles Mayo, "Meckel's diverticulum is frequently suspected, often looked for, and seldom found". Diagnosis of Meckel's is very difficult, plain x-ray; CAT scan and barium are rarely useful. Inflammation of Meckel's diverticulum is rarely suspected before surgery and the condition is usually diagnosed on the operation table once a normal appendix is seen either on laparoscopy or laparotomy. Ongoing bleeding can lead to anemia. History and physical examination are of paramount importance for establishing diagnosis. When a patient has GI bleeding suggestive of Meckel's diverticulum, technetium-99m pertechnetate scanning may be useful in confirming presence of ectopic gastric mucosa. This study has 85% sensitivity and 95% specificity⁷. The sensitivity and specificity of technetium scan can be improved by

pentagastrin and glucagon or cimetidine⁸. In patients with acute bleeding, angiography can sometimes localize the site. Complicated Meckel's diverticulum demands urgent surgical intervention in the form of resection and anastomosis.

Schier et al. describe laparoscopic diagnosis and management of Meckel's diverticulum⁹. Optimal management of incidentally found Meckel's diverticulum is controversial, even though resection has been found to carry a low risk of complications. According to Soltero and Bill, the possibility of a Meckel's diverticulum to become symptomatic in an adult patient is less than 2%, while morbidity rates of incidentally removed Meckel's diverticula were as high as 12% in few studies¹⁰. Mackey et al. have reported a morbidity and mortality of 1% for an asymptotically removed Meckel's diverticulum¹¹. Arnold et al. have reported 0% morbidity and mortality with removal of asymptomatic Meckel's diverticulum¹². According to Cullen et al., incidentally found Meckel's diverticula should be removed¹³. Surgical treatment of Meckel's diverticulum includes either diverticulectomy or ileal resection. Simple diverticulectomy can suffice for asymptomatic diverticula. To avoid luminal narrowing at the diverticulectomy site, transverse/horizontal suturing is preferred. In case of symptomatic Meckel's diverticulum or if there is induration of the base extending into the adjacent ileum, ileal resection is required, as all heterotopic gastric mucosa must be removed.

In summary, Meckel's diverticulum is present in 2% of the population; there may be many variations but a useful aide-memoire is: 2%, 2 feet away from the ileocaecal valve and 2 inch in length. The average length is 5 cm. A length of 17cm is not common and is a rare occurrence. A high degree of suspicion is required for diagnosis of Meckel's diverticulum. Radionucleotide scan is useful in presence of ectopic mucosa and management of incidentally found Meckel's is still controversial.

References

1. Opitz JM, Schultka R, Gobbel L. Meckel on developmental pathology. *Am J Med Genet A* 2006; 140(2):115-28.
2. Yamaguchi M, Tacheuchi S, Awazu S: Meckel's diverticulum, investigation of 600 patients in Japanese literature. *Am J Surg* 1978; 136:247.
3. Fa-Si-Oen PR, Roumen RMH, Croiset van Uchelen FAAM. Complications and management of Meckel's diverticulum - a review. *Eur J Surg* 1999; 165:674-678.
4. Andrew DR, Williamson KM. Meckel's diverticulum - rare complications and review of the literature. *J R Army Med Corps* 1994; 140:143-145.
5. Rutherford RB, Akers DR. Meckel's diverticulum: a

review of 148 pediatric patients, with special reference to the pattern of bleeding and to mesodiverticular vascular bands. *Surgery* 1966; 59:618-626.

6. Andreyev HJ, Owen RA, Thompson I, et al. Association between Meckel's diverticulum and Crohn's disease: A retrospective review. *Gut* 1994; 35:788.

7. Cooney DR, Duszynski DO, Camboa E, et al. The abdominal technetium scan - a decade of experience. *J Pediatr Surg* 1982; 17:611.

8. Petrokubi RJ, Baum S, Rohrer GV. Cimetidine administration resulting in improved pertechnetate imaging of Meckel's diverticulum. *Clin Nucl Med* 1978; 3(10):385-8.

9. Schier F, Hoffmann K, Waldschmidt J. Laparoscopic removal of Meckel's diverticula in children. *Eur J Pediatr*

Surg 1996; 6:38-39.

10. 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; 132:168-173.

11. Mackey WC, Dineen P. A fifty year experience with Meckel's diverticulum. *Surg Gynecol Obstet* 1983;156:56-64.

12. Arnold JF, Pellicane JV. Meckel's diverticulum: a ten-year experience. *Am Surg* 1997; 63:354-355.

13. Cullen JJ, Kelly KA, Moir CR, et al. Surgical management of Meckel's diverticulum: An epidemiologic, population-based study. *Ann Surg* 1994; 220:564-569.

Author Information

Vipul Yagnik, MS, FMAS

Assistant Professor, Department of Surgery, Pramukh Swami Medical College, Shri Krishna Hospital

Jitesh Desai, MBBS, MS

Associate Professor, Department of Surgery, Pramukh Swami Medical College, Shri Krishna Hospital

Sunil Vyas, MBBS, MS

Assistant Professor, Department of Surgery, Pramukh Swami Medical College, Shri Krishna Hospital