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LOWER GASTROINTESTINAL BLEEDING CAUSED BY MECKEL'S DIVERTICULUM

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Abstract: **Meckel's diverticulum is the most common congenital malformation of the gastrointestinal tract occurs in 2% of the general population. Whoever it can cause complications in form of bleeding, obstruction, perforation, fistula and tumors but majority of patients remain asymptomatic. Despite advances in the medical imaging and technology still there is a difficulty in diagnose it pre-operatively. Here I present a case of bleeding Meckel's Diverticulum in an 18 years old male, which diagnosed and managed by minimal invasive surgery after failed pre-operative imaging to detect it.**

Keywords: **Meckel's Diverticulum, Gastrointestinal bleeding.**

1. INTROUDUCTION

Meckel's diverticulum is the most prevalent congenital anomaly of the gastrointestinal tract, affecting approximately 2% of the general population. It is a remnant of the vitelline duct, which is usually located on the anti-mesenteric border of the ileum, within about 60 cm of the terminal ileum. Most of the Meckel's diverticula are discovered incidentally during a surgical procedure performed for other reasons. Bleeding, small bowel obstruction, and diverticulitis are the most frequent complications [1]. Due to the rarity of cases in adults, it is still misdiagnosed preoperatively, although with the wide spread use of technetium-99m pertechnate scan and diagnostic laparoscopic approach, the rates of preoperative diagnosis have improved. We present here a case of lower gastrointestinal bleeding caused by Meckel's Diverticulum with failed preoperative diagnostic method to identify the cause.

2. CASE REPORT

18 years old male presented to the accident and emergency department with bright blood per rectum for 3 days, crampy abdominal pain, palpation and fatigability. He gave a history of on-off dark stool for the last month with unremarkable past medical and surgical history. Examination showed conscious and dehydrated patient with stable hemodynamic parameter apart from upper limit of pulse rate. His abdomen was soft and lax with audible bowel sound. Digital rectal exam showed dark tarry stool. Laboratory investigations showed hemoglobin (8 g/dl), hematocrit 30% and unremarkable result for the rest. Chest and abdominal radiograph were unremarkable. The patient was resuscitated and admitted to the hospital for further investigation since there is no evidence of active bleeding on the initial investigation.

Gastroenterologist was consulted for upper and lower endoscopy which done and showed fresh and altered blood throughout the colon and the terminal ileum up to 20 cm while they did not identify the bleeding source [figure1]. Capsule endoscopy was done also and showed old blood in the ilium and colon without any significant lesion. After that, he underwent angiography, which showed unremarkable study. Then he booked for Meckel's scan and result came with normal distribution of technetium and did not show any evidence of Meckel's diverticulum [figure2].

So, the decision was made to book him for laparoscopic exploration and proceed based upon the findings. Intraoperative, Meckel's Diverticulum with thick content was identified around 70 cm from the terminal ilium. Then we decide to resect and anastomosis that bowel segment, which done uneventfully [figure3]. The histology showed Meckel's Diverticulum lined by ectopic gastric mucosa with ulcerated small bowel segment.

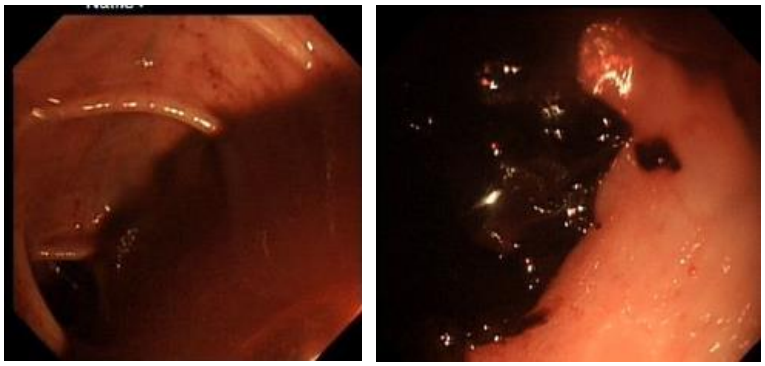

Figure 1: colonscopy showed fresh and altered blood in the entire colon and terminal ilium.

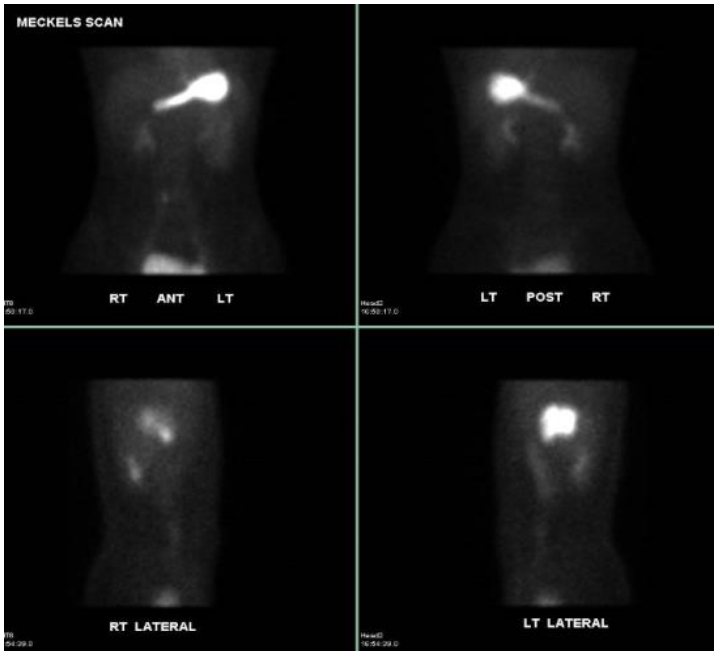

Figure 2: Meckel's scan showed Normal distribution of technetium in the gastric mucosa, kidneys and bladder without scintigraphic evidence of Meckel's diverticulum.

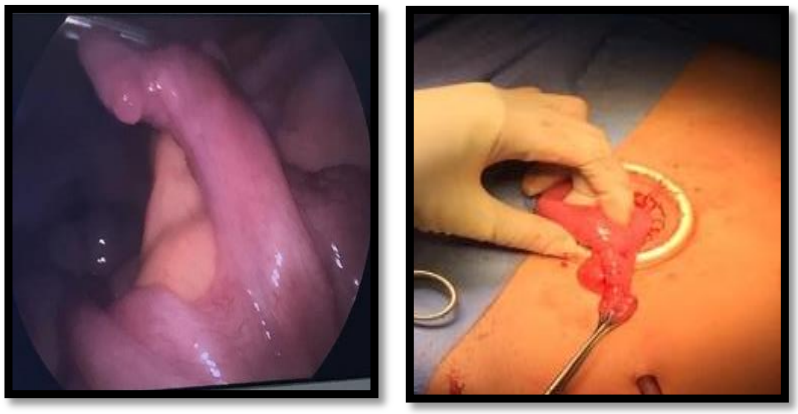

Figure 3: intraoperative photograph shows protruded Meckel's diverticulum from the anti-mesentric wall of the ileum.

3. DISCUSSION

Gastrointestinal bleeding is a major cause of emergency hospital attendance in adults. About 80% of this bleeding in adults originates proximal to the ligament of Treitz. The most common source of the lower gastrointestinal bleeding is colon, with less than 5% of bleeding from small intestine [5]. The usual investigations include upper and lower gastrointestinal endoscopy in addition to the usual laboratory investigations. Capsule endoscopy is a helpful method in

some of the cases with caution and role out obstruction prior to use it. Endoscopy may not be appropriate if there is significant blood pool obstructing the visibility. Angiography and Radionuclide scans (Technetium-bleeding scan) may be used to diagnose rare focal sources of bleeding such as Meckel's diverticulum.

Fabricius Hildanus originally described Meckel's diverticulum in 1598. However, it is named after Johann Friedrich Meckel, who established its embryonic origin in 1809. Meckel's Diverticulum is the most common congenital abnormality of the gastrointestinal tract [2]. It is a remnant of the omphalomesenteric or vitelline duct that connects the yolk sac to the midgut through the umbilical cord. Failure of this duct to obliterate during the eighth week in utero can result in several abnormalities including enterocyst, omphalomesenteric fistula or Meckel's Diverticulum [2]. Cells in the yolk tube have the potential to differentiate into various types of mucosa; thus, it is easy to find ectopic tissues in the diverticulum, Approximately 60% of Meckel's diverticula contain heterotopic mucosa, of which over 60% consist of gastric mucosa. Pancreatic acini are the next most common; others include Brunner's glands, pancreatic islets, colonic mucosa, endometriosis, and hepatobiliary tissues. The ectopic mucosa also has the ability to secrete digestive enzymes, such as gastric acid and other chemical substances, which cause the formation of ulcers of adjacent mucosa and even bleeding like in our case [6,7].

It is true diverticula, containing all layers of bowel wall; it is usually found within 60 - 100 cm of the ileo-cecal valve. It estimated to be found in 2% of the general population and asymptomatic unless associated complications arise. The complications associated with Meckel's Diverticulum include inflammation, perforation, hemorrhage, intussusception, volvulus, intestinal obstruction, and malignant transformation. The total lifetime complication rate has been reported to be approximately 4% to 6% [3,4].

Bleeding is the most common presentation in children and is reported in over 50% of cases [11]. In adults, hemorrhage occurs often but is the presenting complaint in only 11.8% [12]. Children often present with dark red or maroon stools or stools with blood or mucus, whereas adults usually present with melena and crampy abdominal pain and can be present for a long time without obvious cause.

Fewer than 10% of symptomatic Meckel's Diverticulum are diagnosed preoperatively especially in the absence of bleeding. Generally, there is a limited rule for upper and lower gastrointestinal endoscopy to diagnose Meckel's Diverticulum per se in its common location as they are inaccessible to ileum suffering from Meckel's Diverticulum. But with advance technology like capsule endoscopy and double balloon endoscopy show a helpful benefits in the preoperative diagnosis in compare to the standard one. Computed tomography and ultrasonography are usually of little benefit because distinction between a diverticulum and intestinal loops is usually difficult. Radionuclide scans (technetium-99m pertechnate) may diagnose Meckel's Diverticulum when tracer uptake occurs in the presence of ectopic gastric mucosa only. But accuracy, reported to be around 90% in pediatric series [9], drops to only 46% in the adult group [10]. Furthermore, perforated Meckel's Diverticulum often presents as acute abdomen, doctors might not have sufficient time to take various diagnostic measures. The correct diagnosis is usually confirmed by operation. Laparoscopic surgery is propitious to avoid not only negative exploratory laparotomies for patients with false-positive radionuclide scan but also delayed surgical treatments for patients with false-positive scan [12]. So, high index of suspicion is essential in dealing with an undiagnosed abdominal pain.

The definitive treatment for symptomatic Meckel's Diverticulum has always been surgical resection either by laparoscopy or laparotomy. The type of complication encountered and the intraoperative findings guides the extent of resection. If the indication for surgery is bleeding, segmental resection of ileum that includes both the diverticulum and the adjacent ileal peptic ulcer should be performed as the site of bleeding is usually in the adjacent ileum. Segmental resection may also be necessary if the diverticulum contains a palpable mass, inflamed base or wide neck.

The management of asymptomatic Meckel's Diverticulum is debatable unresolved question. More recently, greater enthusiasm for prophylactic diverticulectomy has appeared in the literature [13]. Other authors have advocated a selective approach, with a recommendation to remove diverticula attached by bands, those with narrow bases, any palpable or visual abnormality and younger age at presentation, on the assumption that these diverticula are more likely to develop complications.

In conclusion, Meckel's Diverticulum require high index of suspicion to diagnose it due to the difficulty and limitation with the diagnostic methods especially in those who presented with acute abdomen. And surgical resection is the definitive management for complicated Meckel's Diverticulum.

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