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CASE REPORT

Small Bowel Obstruction Caused by Giant Meckel's Diverticulum

Dev Meckel Divertikülünün Neden Olduğu İnce Barsak Obstrüksiyonu

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ABSTRACT

Meckel's diverticulum (MD) results from incomplete closure of the omphalomesenteric duct. MD is the most common congenital anomaly of the gastrointestinal tract which is seen 1-3%. Most of the patients are asymptomatic however they can become symptomatic due to the complications such as bowel obstruction, hemorrhage, diverticulitis, perforation or other umbilical lesions. These complications can be developed by various mechanisms as volvulus, adhesions, Littre's hernia, intussusception. Small bowel obstruction is the most common presentation in adults accounting for 1/3 of all symptomatic cases. In this paper, we aimed to present a case report of a 19-year-old patient presented with intestinal obstruction as a complication of Meckel's diverticulum. He recovered after a diverticulectomy and had no need for small bowel resection.
Keywords: Meckel diverticulum, ileus, acute abdomen, complication

ÖZ

Meckel divertikülü (MD) omfalomezenterik kanalın tam olmayan kapanmasından kaynaklanır. Gastrointestinal sistemin en sık rastlanan konjenital anomalisi olup %1-3 oranında görülür. Çoğu hasta asemptomatiktir. Ancak barsak obstrüksiyonu, hemoraji, divertikülit, perforasyon veya diğer umblikal lezyonlar gibi komplikasyonlarla semptomatik hale gelebilirler. Bu komplikasyonlar volvulus, adezyon Littre hernisi, invajinasyon gibi çeşitli mekanizmalarla gelişir. İnce barsak obstrüksiyonu, tüm semptomatik olguların 1/3'ünü oluşturan ve erişkinlerde en sık görülen kliniktir. Bu makalede,19 yaşındaki erkek hastada MD'nin bir komplikasyonu olan intestinal obstrüksiyonu sunmayı amaçladık. İnce barsak rezeksiyonuna gerek kalmadan hastaya divertikülektomi yapıldı.
Anahtar Kelimeler: Meckel divertikülü, ileus, akut batın, komplikasyon

Introduction

The first description of a diverticulum of the small intestine is attributed to Fabricius Hildanus in 1598.[1] Meckel diverticulum (MD) results from an incomplete obliteration of the omphalomesenteric or vitelline duct. Failure of obliteration of the vitelline duct results in several anomalies, including omphalomesenteric fistula, enterocyst, fibrous band connecting the intestine to the umbilicus or MD. Rarely, a remnant of the left vitelline artery forms a mesodiverticular band connecting the diverticulum to the mesentery.[2]

Both the pediatric and adult patients with complicated MD may develop small bowel obstruction and present with colic abdominal pain, vomiting, and distention. The mechanism of obstruction can be intussusception of an inverted MD, volvulus, or strangulation of distal ileum by the fibrous band connecting the diverticulum and umbilicus, incarceration in the inguinal canal (Littre's hernia), and rarely by an enlarged diverticulum harboring retained foreign objects, enteroliths or a tumor.[3,4]

Case Presentation

A 19-year-old male suffering from abdominal distention, occasional nausea and vomiting, indigestion, and constipation admitted to the general surgery clinic. He was hospitalized with the diagnosis of subileus.

The patient's laboratory values were studied and revealed no abnormality. Nasogastric and urinary catheter was inserted. Fluid and electrolyte replacement was performed. It revealed

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in the history that he had similar complaints, approximately 2 months ago and relieved with symptomatic treatment. Abdominal ultrasonography and computed tomography (CT) could not disclose any pathology to explain the ileus.

Laparotomy was decided to perform because of increasing distension, 500-600 cc of bilious fluid drained per day, stable air-fluid levels on x-ray, with no improvement in the clinic follow-up. On surgery, small bowel was edematous and dilated with diverticula attacched umbilicus, up to 8 cm in length, located 70 cm from ileocecal valv (Figure 1 and 2). The distal small intestine and colon segments were normal. The diverticulum was resected from the base and the remaining intestinal segment was repaired primarily (Figure 3). There was no intra-abdominal pathology in other organs. Histopathological examination of the specimens was reported as Meckel's diverticulum with lymphoid hyperplasia.

Discussion

MD is the most common congenital anomaly in the gastrointestinal tract. It results from a persistent remnant of the omphalomesenteric duct and it is usually located in the antimesenteric side of the middle/distal ileum. It has an estimated prevalence of 2% in general population and it is twice more prevalent in males.[5]

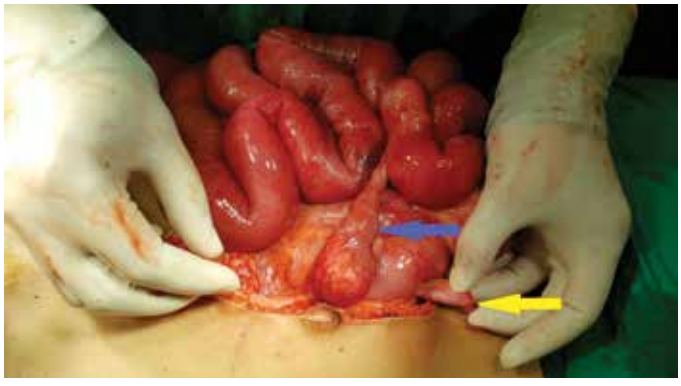

Figure 1. Meckel's diverticulum attached umbilicus (blue arrow is Meckel diverticulum, yellow arrow is appendix)

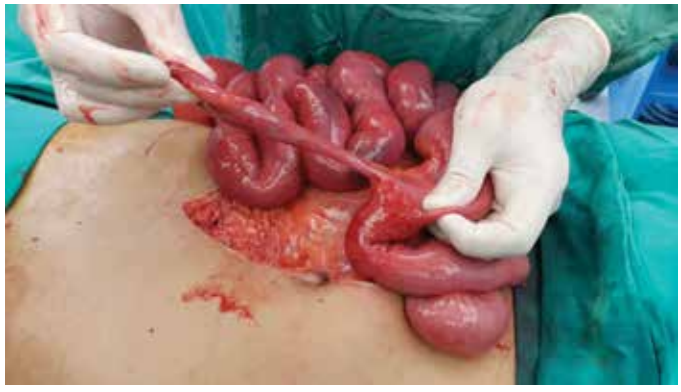

Figure 2. Meckel's diverticulum located 70 cm from ileocecal valv

MD, with or without connection to the umbilicus or to the mesentery, accounts for 90% of all vitelline duct anomalies.[2] MD is a true diverticulum containing all layers of the normal intestinal wall. The position of MD along the length of the small intestine is variable, but is usually found within 10 cm of the ileocecal valve, with a reported record distance of 180 cm.[1] The mean distance from the diverticulum to the ileocecal valve, in one large study, was 34 cm in children of less than 2 years old, 46 cm in those 3 to 21 years old, and 67 cm in adults of 21 years and more. An average MD is approximately 3 cm long, with nearly 90% ranging from 1 to 10cm, 7 and a reported record length of 100 cm.[1,6]

In our case, diverticula was located within 70 cm. Both the size and shape of MD are also variable. Most of them appear as a 3- to 5-cm finger-like structure, but occasionally present as a larger saccular lesion with 5- to 10-cm diameter.[7] In the present case, diverticula was 6.5x3x3 cm in diameter.

The clinical signs and symptoms of Meckel's are variable and reflect the underlying pathologic process. By far the majority remain clinically silent and detected incidentally during radiologic evaluation or abdominal surgery for unrelated conditions.[8]

MD complications are most often from ectopic tissue or bands, either umbilical or mesodiverticular. Several other factors have been associated with increased complication rates including age, gender, and morphologic variants of MD. Most patients with MD are asymptomatic, but in those that develop symptoms, it has been estimated that more than 50% are less than 10 years of age.[6] The mean age of patients with symptomatic MD is 10 years in some series. Many studies have demonstrated that symptomatic MD is more common in men than women, with a male to female ratio ranging from 2:1 to 5:1.[9] Other incriminated predisposing factors to complications include diverticular length and base diameter. Long, narrow-based diverticula are thought to be more prone to obstruction or inflammation; short, large-based diverticula are subject to foreign body entrapment.

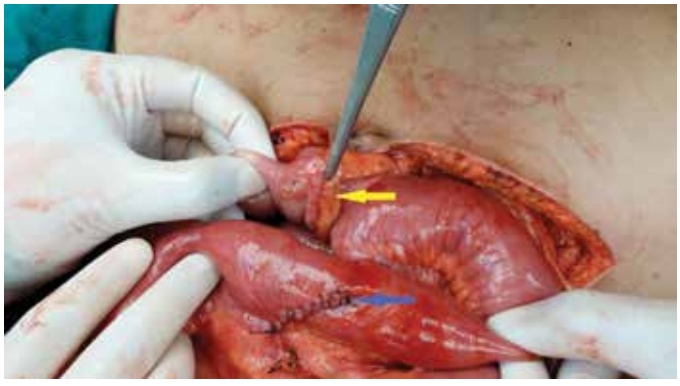

Figure 3. Installation of the suture after diverticulectomy (blue arrow is repair area, yellow arrow is appendix)

Finally, the location of an MD does not appear to affect the complication rate.[1]

Complicated MD may be clinically indistinguishable from a variety of other intra-abdominal diseases such as acute appendicitis, inflammatory bowel disease, or other causes of small bowel obstruction.[10] Obstruction of various types is the most common presenting symptom in the adult population, occurring in almost 40% of patients. Mechanisms of obstruction include enlargement of the small bowel around a fibrous band attached to the umbilicus, entrapment of an intestinal loop within a mesodiverticular band, intussusception with a free diverticulum acting as a lead point, volvulus around an umbilical band, or stenosis secondary to chronic diverticulitis. MD may be found in the sac of either inguinal or femoral hernias (Littre's hernia), most often on the right side, in 2% to 5% of patients. These hernias may become incarcerated and produce intestinal obstruction.[1,4]

In our case, the MD with a narrow neck was causing bowel obstruction in accordance with the literature. There was no ischemia in the intestinal wall, neither volvulus of the small intestine or marked narrowing of the lumen.

The correct diagnosis of MD before surgery is often difficult because a complicated form of this condition is similar to many other abdominal pathologies.[10] CT and sonography are usually of little value because distinction between a diverticulum and intestinal loops is usually difficult. Radionuclide scans (^{99m}-Tc-pertechnetate) may diagnose MD when uptake occurs in ectopic gastric mucosa or by identifying the site of gastrointestinal bleeding. But accuracy, reported to be around 90% in pediatric series,[11] drops to only 46% in the adult group. Arteriography, indicated in cases of acute bleeding, may otherwise be helpful in detecting a capillary stain or anomalous arteries (mesodiverticular band). Finally, laparoscopy, as a diagnostic tool in cases of symptomatic MD, has also been reported.[1]

Abdominal sonography and CT was performed but revealed no abnormality in our case. Since there was not intestinal bleeding, angiography and scintigraphy was not performed. The patient underwent diagnostic laparotomy.

Surgical treatment of MD may be by open or laparoscopic procedures, either incidentally or programmed. Principles of resection are the same; MD and associated bands should be removed, and involved small bowel appropriately managed. To avoid narrowing the ileal lumen, transverse suturing, either hand-made or mechanical, is preferred. Ileal resection should be preferred in cases of bleeding diverticula, inflammatory or perforated base, or in case of tumor. Laparoscopic treatment of MD has been increasingly reported with techniques including intraabdominal wedge resection or extracorporeal or intracorporeal bowel segment resection.[12] In our case, we performed diverticulectomy and sutured it primarily without narrowing the intestinal segment.

The confirmative diagnosis of MD could only be made during surgery, which can be therapeutically problematic, as early surgery is important to prevent strangulation and gangrene of the bowel. The lesson from this case is that MD should be kept in mind as one of the differential diagnoses of an acute abdomen.

Ethics

Informed Consent: It was taken.

Peer-review: Internal peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: Osman Toktaş, Abdussamet Batur, Concept: Osman Toktaş, Abdussamet Batur, Design: Osman Toktaş, Abdussamet Batur, Data Collection or Processing: Osman Toktaş, Abdussamet Batur, Analysis or Interpretation: Osman Toktaş, Abdussamet Batur, Literature Search: Osman Toktaş, Abdussamet Batur, Writing: Osman Toktaş, Abdussamet Batur.

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