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An interesting coexistence: Small bowel volvulus and small bowel diverticulosis

İlginç bir birliktelik: İnce barsak volvulusu ve ince barsak divertikülozu

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Acquired (non-Meckel's) jejuno-ileal diverticular disease is uncommon, and most surgeons have limited, if any, experience with this condition. We present an interesting case with coexistence of small bowel diverticulum and small bowel volvulus with massive abdominal distension, in which the patient had a history of abdominal distension without abdominal pain over a five-year period. A brief discussion of the common clinical features is given and the principles of treatment of jejuno-ileal diverticular disease and small bowel volvulus are presented. A 29-year-old man with no history of laparotomy was admitted with abdominal distension and abdominal compartment syndrome symptoms. An emergency laparotomy revealed 180 degree clockwise volvulus of the multiple diverticula-bearing terminal ileum. There was no diverticulum in other sites of the small intestine and colon. Additionally, there was neither adhesion nor any congenital anomalies at the other sites of the gastrointestinal system. The viability of the intestine was normal but the diameter of the ileum was extremely enlarged (approximately 20 cm). In addition, the bowel wall was also hypertrophied. The rotated and enormously enlarged diverticula-bearing small intestine was removed with cecum, and ileocolostomy was performed. The patient was discharged uneventfully from hospital on the eighth postoperative day. After the operation, all symptoms of the patient disappeared. Small bowel obstruction is a common cause of emergency surgical admission. Awareness of the fact that volvulus of the diverticula-bearing segment of the jejuno-ileum is a rare cause of small bowel obstruction may lead to earlier and prompt diagnosis and treatment.

Key words: Small bowel diverticulosis, small bowel volvulus

Edinsel (Meckel olmayan) jejuno-ileal divertiküler hastalık nadirdir ve eğer karşılaşmamışsa çoğu cerrahın bu konudaki tecrübesi sınırlıdır. Biz, 5 yılı aşkındır karın ağrısı olmaksızın karında şişlik şikayeti olan ve massif abdominal distansiyonla başvuran ilginç bir ince barsak divertikü ve ince barsak volvulusu birlikteliği olgusu sunuyoruz. Jejuno-ileal divertiküler hastalık ve ince barsak volvulusunun genel klinik özellikleri ve tedavi prensipleri kısaca tartışıldı. Laparotomi öyküsü olmayan 29 yaşında erkek hasta karında şişkinlik ve abdominal kompartman sendromu bulguları ile başvurdu. Acil laparotomide saat yönünde 180 derece rotasyona uğramış multipl divertiküller bulunan terminal ileum saptandı. Kolon ve ince barsak bölümlerinde başka divertikül saptanmadı. Ayrıca gastrointestinal sistemin diğer bölümlerinde ne adezyon ne de konjenital bir anomali saptanmadı. Bu barsağın kanlanması normaldi ancak buradaki ileumun çapı ileri derecede genişlemişti (yaklaşık 20 cm). Ek olarak, barsak duvarı da hipertrofikti. Rotasyona uğramış ve ileri derecede genişlemiş ince barsak çekumla birlikte çıkarıldı ve ileokolostomi uygulandı. Hasta potoperatif 8. gün sorunsuz olarak hastaneden taburcu edildi. Ameliyat sonrası hastanın tüm semptomları kayboldu. İnce barsak obstrüksiyonu sık görülen bir cerrahi acildir. Divertiküllü jejunaileal barsak segment volvulusunun ince barsak obstrüksiyonunun nadir bir nedeni olduğu gerçeğinin farkında olunması erken ve doğru tanı ve tedaviye olanak sağlayabilir.

Anahtar kelimeler: İnce barsak divertikülozu, ince barsak volvulusu

INTRODUCTION

Acquired jejuno-ileal diverticulosis is an uncommon entity (1). Solitary or multiple diverticula may occasionally be found in the jejunum or less commonly in the ileum (2). Diverticula of the small intestine are symptomless in the majority of cases. However, an intestinal diverticulum may produce diverticulitis and perforation, hemorrhage, obstruction, or small intestine stasis syndrome (blind loop syndrome). Causes of bowel obstruction in jejuno-ileal diverticulosis include bowel adhesion, intussusception, and acute volvulus of the diverticulum-bearing loop of the intestine and extrinsic bowel compression from a large fluid-filled diverticulum (3). Coexistence of large small-bowel diverticulum and small bowel volvulus has been reported previously (4, 5). Surgeons unfamiliar

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with this pathology may misdiagnose or mismanage such complications. A case in which volvulus of the terminal ileum may have resulted in ileal diverticulosis formation is described.

CASE REPORT

A 29-year-old male was admitted to the emergency clinic with abdominal pain, excessive abdominal distension and dyspnea. He had a history of abdominal distension over a five-year period. He had not undergone any laparotomy operation. He had confusion and dyspnea. Respiration rate was increased (30/minute). The body temperature was 36°C, pulse 120 beats per minute, and blood pressure 110/90 mmHg. His abdomen was exceedingly distended and stretched. Hyperactive and metallic bowel sounds were auscultated. Tenderness or muscle guarding could not be assessed reliably. Intra-cystic pressure was 30 cm water. Blood count revealed a leukocyte count of 17800/mm^3 and hemoglobin value of 15.2 mg/dl. An abdominal X-ray revealed air-fluid levels in the extremely distended intestine (Figure 1). Basic biochemistry panel was within normal values.

When the patient's clinical and abdominal X-ray findings were considered, sigmoid colon volvulus was suspected (Figure 1). An emergent laparotomy was preferred to endoscopic decompression to provide urgent decompression of the abdomen and to save time. During the operation, an extremely enlarged (about 20 cm diameter) terminal ileum was observed with clockwise rotation of 180° (Figure 2). There were multiple diverticula within the twisted segment on the mesenteric border (Figure 4). No ischemic changes were found

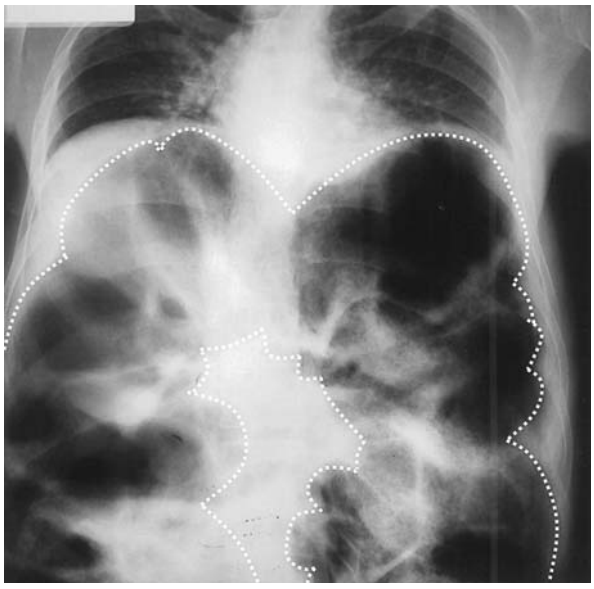

Figure 1. Abdominal X-ray revealed air-fluid levels in the extremely distended intestine

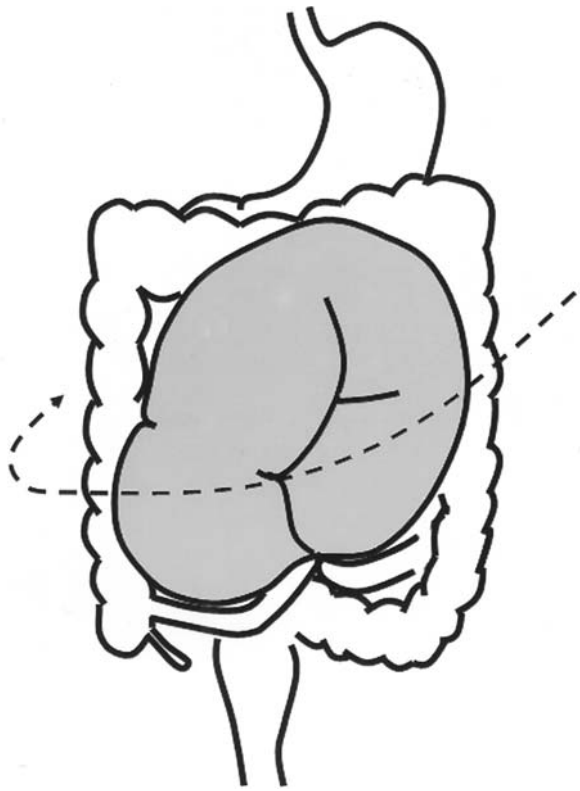

Figure 2. Enlarged terminal ileum had undergone clockwise rotation of 180°

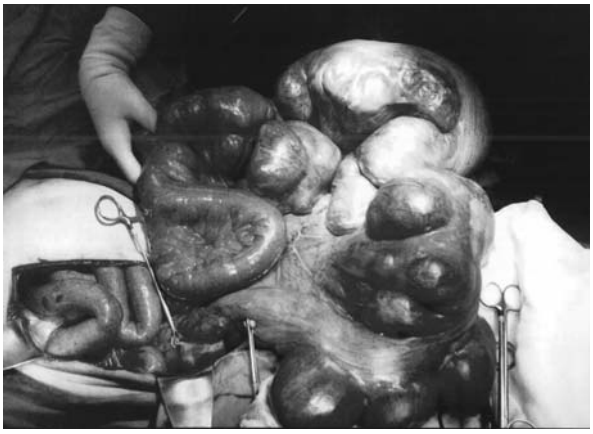

Figure 3. Extremely enlarged ileum is seen after detorsion. Enlargement starts 10 cm distant to ileocecal valve and extends to 160 cm. Babcock clamps are grasping cecum (tenia libera) and vermiform appendix

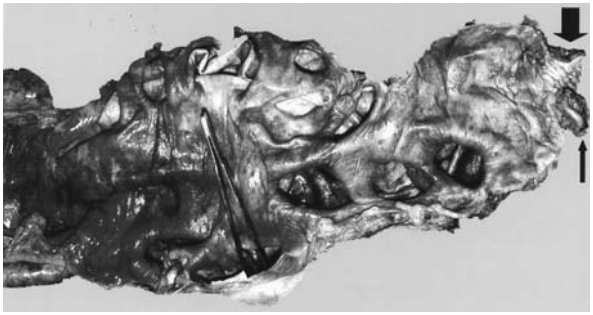

Figure 4. Diverticular lesions are seen on mesenteric border of the enlarged ileum (a 20 cm long forceps tip is in it). Thin arrow indicates vermiform appendix and thick arrow indicates cecum

(Figure 3). There was neither adhesion nor any congenital anomalies. Additionally, the affected bowel wall was hypertrophied. Detorsion was carried out followed by resection of the rotated intestine with cecum and ileocolonostomy. At the pathological examination, no aganglionic segment was recognized. The patient was discharged uneventfully eight days after surgery, and was symptom-free during 31-months' follow-up.

DISCUSSION

Small intestinal diverticula are acquired (false) structures, and the incidence increases with age (6). The jejuno-ileum is the least common site for diverticula in the entire gastrointestinal tract (7). Jejuno-ileal diverticula consist of mucosa, submucosa, and serosa, and are found along the mesenteric border where blood vessels enter the bowel wall. The reported incidence of jejuno-ileal diverticula on small bowel studies by enteroclysis is 2-2.3%, comparable to autopsy data demonstrating an incidence of 1.3-4.6% for acquired diverticula of the jejunum and ileum (7). Jejuno-ileal diverticulosis is usually multiple and more common in the jejunum than in the ileum (3). Though the majority (76%) of the patients were in or beyond their sixth decade of life, the age range was reported to include young adults (1). In contrast to true (congenital) diverticula such as Meckel's, false (acquired) diverticula occur along the mesenteric border of the small bowel often hidden within the leaves of the mesentery. Jejuno-ileal diverticulosis is associated with diverticulosis of other parts of the gastrointestinal tract (esophagus up to 2.3%, duodenum up to 30% and colon up to 61%) (3).

Symptomatology of Jejuno-ileal Diverticulosis

Diverticula of the small intestine are symptomless in the majority of cases and do not require operative management. The underlying intestinal dyskinesia, however, coupled with the paucity of muscular elements within the wall of these false diverticula may result in uncoordinated peristalsis, inefficient emptying, and diverticular distension (8). This gives rise to symptoms of bloating and vague abdominal discomfort (1, 8). There may be recurrent attacks of colicky abdominal pain, indicating a subacute obstruction due to inflammatory adhesions or repeated volvulus attacks (4). The relative stasis of intestinal contents within the diverticulum can result in bacteria overgrowth, malabsorption, steatorrhea, and megaloblastic anemia. A significant number of patients improve with the administration of oral antibiotics such as metronidazole. However, surgical resection may be the only alternative in patients failing to respond to medical treatment and who have significant malabsorption and steatorrhea.

Complications of Jejuno-ileal Diverticulosis

Jejuno-ileal diverticula complications were reported to occur in 6 to 46% of patients (2, 3, 8). The most common complication of jejuno-ileal diverticula was diverticulitis with perforation and abscess formation, accounting for 53% of the overall complications (8). Bleeding was reported as a relatively rare complication of jejuno-ileal diverticula (8). Mechanical intestinal obstruction occurs in 2.3% to 4.6% of cases of jejuno-ileal diverticulosis (9). This may be the result of pressure on the intestinal wall from distended diverticula, inflammatory mass associated with diverticulitis, stricture or adhesions from recent or past diverticulitis, intussusception at the site of diverticulum, enteroliths developed within the diverticula, or volvulus of the diverticula-containing segment. An enterolith formed in a large diverticulum may pass into the lumen and lead to its obstruction.

Treatment of Jejuno-ileal Diverticulosis

The management of jejuno-ileal diverticulosis is controversial, varying for example in asymptomatic cases from an expectant approach to bowel resection, and in perforations from diverticulectomy to bowel resection. Most authors have recommended that incidentally discovered or asymptomatic small-bowel diverticula do not merit surgical resection. Surgical intervention is mandatory in patients with complications of ileal diverticulosis, and formal resection is the mainstay of surgical treatment (1). The question of removing diverticu-

la found incidentally at laparotomy has not been resolved. If a dilated, hypertrophied segment of bowel with large diverticula is found, it may indicate a progressive form of the disease, in which case resection of the diverticular segment found incidentally at laparotomy is recommended (7).

Small Bowel Volvulus

Small bowel volvulus represents twisting of the small bowel around the main trunks of the superior mesenteric artery and vein (usually in neonates or infants in the presence of congenital malrotation) or torsion of a closed-loop small bowel segment (usually in adults in the presence of adhesion and internal hernia) (4, 10). Small bowel volvulus is uncommon in Western countries, being more common in Africa and Asia. The etiology may be primary, as is often seen in Africa and Asia, while in Western countries other predisposing conditions usually initiate the volvulus (10-13). Most of the cases are diagnosed as acute intestinal obstruction (14). Severe abdominal pain is the principal symptom in almost all patients (11). Abdominal distension is seen in almost half of the patients (11). The rarity and consequent delay in diagnosis accounts for the higher incidence of gangrenous small bowel volvulus in the Western world (11).

Comments on our Case

In our case, the main clinical symptom in the patient's history was painless abdominal distension without vomiting or nausea. It is reported that abdominal distension can appear due to interference of normal peristalsis and propulsion of intestinal content, a condition described as intestinal dyskinesia (3, 8). Compromised respiration caused by severe abdominal distension was our patient's emergency. This presentation is different from both classical small bowel volvulus and jejuno-ileal diverticulosis. The hypertrophied, thickened and extremely enlarged small bowel found at laparotomy would suggest that partial obstruction was present for some time before the acute episode that necessitated hospitalization (15) (Figures 2, 3). Torsion of the diverticula-bearing ileum caused a short segment closed-loop. Actually, in jejuno-ileal diverticulosis, volvulus of the diverticula-containing segment is a cause of intestinal obstruction (2, 4, 5). The involved segment, with its diverticula filled with fluid, which is considerably heavier than the non-involved part, might be responsible for initiating the volvulus, with the loaded segment swinging like a pendulum (9). Chou et al. (4) reported that a large small-bowel diverticulum (or diverticula) was much more commonly seen in patients with volvulus (35%) than in those who underwent laparotomy with a diagnosis other than small bowel volvulus (1%) ($p<0.001$). Surgical therapy consists of untwisting or resecting of the involved segment. A mortality rate of 25% has been reported (9).

SUMMARY

We present a volvulus of the terminal ileum which might have been induced by ileal diverticulosis. Jejuno-ileal diverticular disease can be diagnostically and therapeutically challenging, and complications are often diagnosed only at laparotomy. Furthermore, symptomatic acquired diverticular disease of the jejunum and ileum is an uncommon disorder. Therefore, most surgeons have little or no experience with this condition and do not appreciate the potential surgical implications. It seems that surgeons have tended to record small bowel diverticulum (or diverticula) as an incidental finding, instead of as a cause of a small bowel volvulus attack (4). It is suggested that a large small-bowel diverticulum (or diverticula) might play a contributing role in the occurrence of small bowel volvulus in adults (4,5). In an emergency situation, when the diverticula are confined to a small segment of the bowel, resections should be restricted to the segment bearing the affected diverticulum (2).

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