

Solitary caecum diverticulitis mimicking acute appendicitis

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ABSTRACT

Solitary cecum diverticulum is a benign formation, but it can be complicated with inflammation, perforation and bleeding. Cecum diverticulitis (CD) is the most common complication of caecal diverticulum and it has the highest incidence among Asians, but it is a rare condition in the western world. The incidence of colonic diverticular disease can vary according to national origin, cultural structure and nutritional habits. CD is not common in our country, but it is an important situation because of its clinical similarity with the commonly seen acute right side abdominal diseases like acute appendicitis. Preoperative diagnosis is difficult, and hence, the actual frequency is not known. The treatment of CD can vary from medical therapy to right hemicolectomy. In this study, we presented ten CD cases on whom surgical resection was performed in our surgery unit during the last 8 years. Our purpose was to increase the awareness of surgeons about this situation, and so, make them pay attention for not having their first experience in the operating room.

Key words: Acute abdomen; cecum diverticulitis; diverticular disease of the colon.

INTRODUCTION

Cecum diverticulum can be seen with widespread colon diverticulosis as an acquired lesion. Alternatively, it may appear as solitary cecum diverticulum known as congenital originated. The prevalence of diverticular disease of the cecum is based on variable factors like national origin, cultural background and nutritional habits.^[1] In the Western world, diverticulum is basically located in the distal colon, sigmoid colon is involved in 90% of the patients, and on the other hand, right side involvement is only seen in 5% of the patients.^[2] However, right side involvement is very noticeable in Asian countries.^[3] In addition, in a review of a large series where barium enema was used, solitary cecum diverticulum incidence was found to be only 0.1%. Additionally, in only 5% of these cases, cecum was involved with generalized diverticulosis.^[4]

The most common complication of cecum diverticulum is cecum diverticulitis (CD). Patients with cecum diverticulum are usually asymptomatic; however, clinical symptoms can be

seen in 10–20% of the patients according to complications like inflammation, perforation, hemorrhage and rarely intestinal obstruction.^[5,6] Acute appendicitis is the most common false diagnosis for CD.^[5] In fact, patients who have CD suffer from prolonged complaints accompanied by intermittent or chronic symptoms. The pain of CD begins from the right side of the abdomen or at right lower quadrant rather than periumbilical region and remains, vomiting is not common. Preoperative diagnosis is difficult, and CD should be kept in mind for patients with right lower quadrant pain.^[7]

This study aimed to present our experience in the surgical management of ten cases of CD over an 8-year period. Our purpose was to increase the awareness of surgeons about this situation, and so, make them pay attention for not having their first experience in the operating room.

CASE SERIES

A retrospective analysis of the surgical treatment of acute diverticulitis of the caecum performed between November 2005 and November 2013 within the Emergency Surgical Department of the Okmeydanı Training and Research Hospital was carried out. Patients who received only medical therapy were excluded from the study. Patients were identified from the hospital's operating records based on the final postoperative diagnosis. The search revealed ten patients that underwent surgery for diverticular disease of the caecum.

In all cases, the correct diagnosis of diverticulitis was confirmed by histopathological examination. The data collected

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included age, gender, presenting signs, symptoms, and clinical parameters. Preoperative laboratory values, including full blood count, renal panel and urine analysis were also recorded. In addition, indication for surgery, operative findings and interventions, perioperative complications, operative procedures performed, postoperative mortality and morbidity, and length of hospital stay were documented.

RESULTS

Ten cases of CD were identified. The clinical data of these ten cases are summarized in Table 1. Patient age ranged from 21 to 79 years (mean, 38.9 years). There were 5 female and 5 male patients. Nine patients were admitted to hospital with a presumed clinical diagnosis of acute appendicitis. All cases presented with abdominal pain that localized in the right iliac fossa (7 out of 10), diffuse abdominal pain (2 out of 10) or hypogastrium (1 out of 10). Fever ($>38^{\circ}\text{C}$) was present in six out of 10 patients. Further symptoms were palpable abdominal mass (1 out of 10), nausea (7 out of 10), and vomiting (2 out of 10). Moreover, no urinary symptoms or history of inflammatory bowel diseases presented. The duration of the symptoms until admission to the clinic ranged between 12h and 4 days (mean 36h).

Eight patients had leukocytosis with polymorphonucleosis. Leucocyte count ranged from 8,500 to 18,100/dl (mean 12,800/dl). Only one patient had a history of appendectomy. Preoperative abdominal ultrasonography (US) were performed in all patients. US showed inflammation findings in the right iliac fossa (5 out of 10), a mass in the lower cecum (1 out of 10), free fluid between intestinal loops in the right lower quadrant and mesenchymal lymphadenopathy (1 out of 10) and normal findings (3 out of 10). Preoperative abdominal computed tomography (CT) scans were performed in three cases, showing circumferential thickening of the right colon with surrounding inflammatory changes.

All patients were applied intravenous therapy (antibiotic-sec-

Table 1. The clinic data of 10 patients

Age (yr)	21–79 (38.9)
Gender ratio	5/5 (50%)
Duration time	12h–4d (36h)
Abdominal pain	
Right iliac fossa	70%
Diffuse	20%
Hypogastrium	10%
Nausea	70%
Vomiting	20%
Leukocytosis ratio	80%
White blood cells ($\times 10^3/\text{L}$)	8.5–18.1 (mean 12.8)
Mean hospital stay	5 d

ond generation cephalosporin-, fluids, antiemetic -as needed for patient comfort-) and were also ordered a fasting from food and fluids in the preoperative period. The decision for surgical treatment was made for ten patients who had acute abdomen signs, persistent complaints, and unimproved laboratory findings despite the applied medical treatment. All patients with the diagnosis of acute abdomen were operated within the first 24–48h of admission. In nine patients, our initial diagnosis was acute appendicitis. In the patient who had a history of appendectomy, we considered CD or Meckel's diverticulitis as a probable diagnosis for acute abdomen. A McBurney's incision was conducted in nine patients while a lower right quadrant transverse incision was performed in one patient. In one of these cases, tube cecostomy was additionally performed due to vulnerable caecal wall, utilizing a thick Foley catheter (Fig. 1a). One patient had a perforated small diverticulum with limited inflammatory reaction. This patient was subjected to closure of the ruptured site in two layers with interrupted Vicryl 3/0 sutures and drainage of the region. All patients were treated successfully with di-

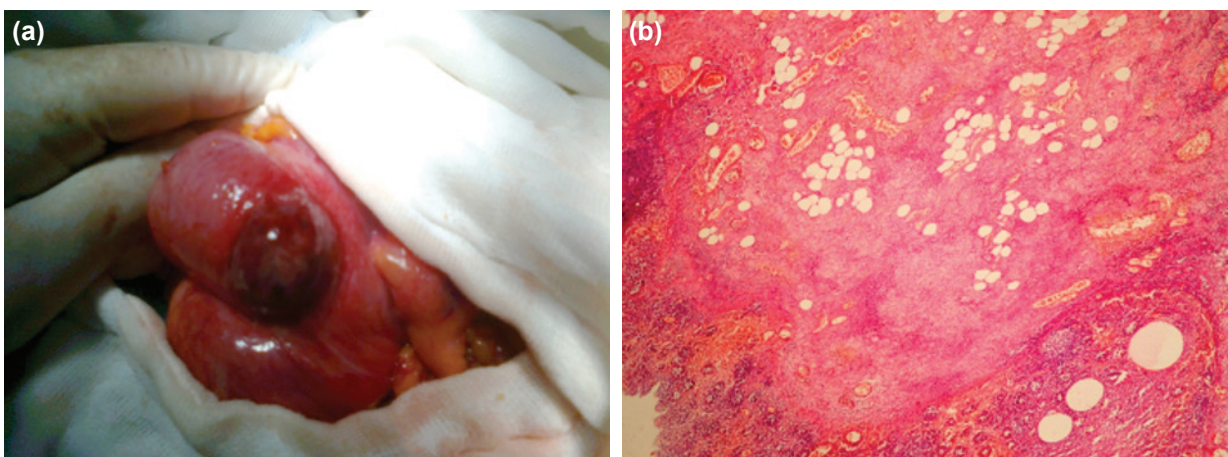


Figure 1. (a) Photograph of perforated ceceal diverticula. (b) Histopathological appearance of perforated ceceal diverticula (Hematoxylin eosin, x40).

verticectomy. Nine patients were additionally subjected to appendectomy. Pathological examination showed single caecal diverticula with diverticulitis (Fig. 1b). The postoperative course of all patients was uneventful. Oral feeding was started after the mobilization of the bowel. From the moment of diagnosis, the average stay in hospital was five days, and no death or serious postoperative complication was observed. At (long term) follow up (mean 5,1 years, range 1–8 years) all patients were alive.

DISCUSSION

Most solitary cecum diverticulum cases originate from the anterior aspect of the cecum, and they generally perforate when they are inflamed and cause peritonitis. On the other hand, posteriorly localized CD does not cause peritonitis and can be confused with perforated cancer as it may generate a mass. More than 70% of CD cases have false diagnosis when they are taken to surgery because of acute appendicitis.^[5,8]

Although contrast enema is useful for the diagnosis of cecum diverticulum, its usage is limited as it can cause perforation in asymptomatic patients during acute exacerbation. Recently recommended diagnostic methods for differentiation of CD from acute abdomen pathologies before the surgery are CT, US, and magnetic resonance imaging (MRI).^[9]

Although US was performed to all cases presented in our study, any specific finding related to CD was not determined. However, US is operator dependent, not as accurate as CT for identifying alternative diagnosis, and not as useful for surgical planning when intervention is required. Furthermore, US may be totally unsuccessful, and may not show the colon in obese patients or in patients with bowel gas. Although CT is a safer diagnostic procedure rather than US in CD diagnosis,^[8] CT scans were performed in only three cases in our study since we did not consider CD primarily. Additionally, CT can eliminate complications and have prognostic importance in response to medical treatment and relapse. Besides, CT is helpful for the percutaneous drainage of abscess.^[10,11] Recently, a study reported that multi-detector CT has become the best imaging modality to evaluate patients presenting with right lower quadrant abdominal pain or suspected acute cecal pathology.^[12] MRI can be a valuable alternative to CT in young or pregnant patients who have suspected appendicitis and an uncertain US result.^[13]

Low incidence of nausea, vomiting, and anorexia; also variable point of maximum tenderness of abdominal pain during palpation examination are important clinical findings that make us think of CD rather than acute appendicitis.^[14] In our study, nausea and vomiting complaints were also rare. True preoperative clinical diagnosis occurs in 4% to 16% of CD cases, and the reported incidence of finding CD during presumed appendectomy is quoted at 1 in 300 cases.^[14] In our study, we performed almost 8000 appendectomies in the same 8-year

period. The frequency of CD was low (1 in 800 appendectomies). We believe that the reason for this is excluding patients who received medical treatment only.

In nine out of 10 patients, a McBurney incision was performed; whereas, in a 22-year-old female patient, the abdomen was reached via a lower right quadrant transverse incision which provided a better cosmetic result in our study. We recommend a McBurney incision in the presence of suspicious signs of acute appendicitis. This incision may be extended, if necessary, intraoperatively. Treatment of CD is still controversial, varying from conservative therapy to aggressive surgery.^[6,15,16] There is no consensus among surgeons as to the best option. There are studies recommending conservative medical treatment or only diverticectomy, if technically possible, for the treatment of CD cases, and these studies have reported that excisional treatment prevent the relapse of the symptoms.^[15] In the presence of excess inflammatory changes, multiple diverticulum and caecal phlegmon or if cancer cannot be excluded; aggressive resection like right hemicolectomy should be considered. Because, in these patients, surgical treatment can be applied safely without any major complication.^[8,15] Laparoscopic or open surgical procedures may be performed. In 1994, the first laparoscopic diverticectomy was performed.^[17] After that, several reports have demonstrated that laparoscopic resection is feasible in experienced hands.^[18]

In our study, all patients were treated successfully with diverticectomy. If there is no intense inflammation and the area comprising of the diverticulum may be separated from the normal encircling area, diverticectomy (with local resection of the diverticulum) may be safely performed. However, we performed tube cecostomy in one case due to vulnerable caecal wall, utilizing a thick Foley catheter. We recommend tube cecostomy as a safe and effective method of preventing cecal fistula formation and as a necessity for decompressing the distal colon in certain cases, depending on the presence of perforation, patient status and the size of the cavity after diverticectomy.

In conclusion, CD is a rare cause of acute abdomen in our country. Generally, it cannot be distinguished from acute appendicitis clinically and surgeon meets healthy appendicitis and CD. In some cases, they can come with a mass in the right iliac fossa and awareness of the surgeon is very important in this situation. If intraoperative diagnosis is indefinite and especially cancer cannot be eliminated, then limited right hemicolectomy and ileocolic resection can be recommended. The purpose of this study was to increase awareness for CD in patients who have a mass in their right iliac fossa and who have acute appendicitis diagnosis with suspicious clinic. According to our expertise, if the diagnosis is reliable, then, diverticectomy and appendectomy can be an adequate treatment in the cases of solitary CD when inflammation is not so severe.

Conflict of interest: None declared.

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OLGU SERİSİ - ÖZET

Akut apendisite benzeyen soliter çekum divertiküliti

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Soliter çekum divertikülü benign bir oluşumdur ama enflamasyon, perforasyon ve kanama ile komplike bir hale gelebilir. Çekal divertiküllerin en yaygın komplikasyonu olan çekum divertiküliti (ÇD), Asyalılar arasında yüksek insidansa sahip, ama Batı dünyasında ender bir durumdur. Kolonik divertiküler hastalığın insidansı ulusal kökene, kültürel yapı ve beslenme alışkanlığına göre değişir. Çekum divertiküliti ülkemizde yaygın değildir, ama akut apandisit gibi diğer sık görülen akut sağ taraf karın hastalıklarına klinik açıdan çok benzediği için önemli bir durumdur. Cerrahi öncesi tanısı zordur ve bu nedenle güncel sıklığı bilinmez. Çekum divertikülitinin tedavisi tıbbi tedaviden sağ hemikolektomiye kadar değişir. Bu çalışmada son sekiz yılda acil birimimizde cerrahi rezeksiyon uygulanan 10 ÇD olgusunu sunduk. Amacımız cerrahlar arasında bu duruma olan farkındalığı artırarak, ilk deneyimlerinin ameliyathanede olmaması için özen göstermeleridir.

Anahtar sözcükler: Akut karın; çekum divertiküliti, kolonun divertiküler hastalığı.

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