Turkish Journal of Trauma & Emergency Surgery
Ulus Travma Acil Cerrahi Derg 2013;19 (1):86-88
Case Report
Olgu Sunumu
doi: 10.5505/tjtes.2013.39327

Barolith as a rare cause of acute appendicitis: a case report

Akut apandisitin nadir bir nedeni; baryum taşı: Olgu sunumu

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A barolith consists of inspissated barium associated with feces and is seen, rarely, after barium studies for imaging the gastrointestinal system. The barium used in such studies can enter the appendiceal lumen and, rarely, cause appendicitis by obliterating or narrowing the lumen of the appendix. The appendix fills with barium and the entire appendix is visualized in 80-90% of barium swallow or enema studies, and this is accepted as a reliable sign of a non-diseased appendix Post-examination retention of barium in the appendix is very common (90~95%), and 10% of the patients retain barium in the appendix beyond 72 hours. If the barium is retained for more than two months, complicated appendicitis can result. We present a 46-year-old male who was diagnosed with acute appendicitis due to a barolith and required an appendectomy three months after a double-contrast barium enema study. After barium studies, patients should be informed regarding retention of barium in the appendix and the possibility that it can cause acute appendicitis. Thus, if abdominal pain develops, the patient can be referred quickly to a medical center for the appropriate treatment and the complications of acute appendicitis can be prevented with early intervention.

Key Words: Appendicitis; barium; barolith; fecalith.

Baryum taşı, yoğunlaşmış baryum ile feçesten oluşur ve gastrointestinal sistem (GİS) görüntüleme çalışmalarından sonra nadiren görülür. Bu tür görüntüleme yöntemlerinde kullanılan baryum apendiks lümenine girebilir ve lümeni daraltarak ya da tıkayarak nadiren akut apandisite sebep olabilir. Baryum yutularak ya da lavmanla yapılan bu görüntüleme tetkiklerinde, baryum %80-90 apendiks lümenini doldurur ve apendiks görüntülenir ve bu sağlıklı apendiks bulgusu olarak kabul edilir. İnceleme sonrası %90-95 oranında baryum apendikste kalır ve bu kalma süresi hastaların %10'unda 72 saatten uzundur. Baryumun apendikste kalışı 2 aydan uzun sürerse komplike apendisitle sonuçlanabilir. Bu yazıda, baryumlu çift kontrast kolon grafisinden 3 ay sonra, baryum taşına bağlı akut apandisit tanısı alan ve apendektomi yapılan 46 yaşında erkek hasta sunuldu. Baryumlu görüntülemelerden sonra baryumun apendikste kalarak akut apandisite sebep olabileceği yönünden hastalar bilgilendirilmeli ki eğer karın ağrısı gelişirse, hızlı bir şekilde uygun tedavi için bir sağlık merkezine yönlendirilebilir ve erken girişimle akut apandisitin komplikasyonları önlenebilir.

Anahtar Sözcükler: Apandisit; baryum; baryum taşı; fekalit.

A barolith consists of inspissated barium associated with feces, and is seen, rarely, after barium studies for imaging the gastrointestinal system. It may cause different clinical conditions, depending on its location in the gastrointestinal system, including volvulus, intussusception, colonic obstruction, ulceration or perforation, and appendicitis.[1]

We present a patient who developed appendicitis due to a barolith three months after a barium swallow for an upper intestinal series and a double-contrast barium enema.

CASE REPORT

A 46-year-old male was admitted to our clinic complaining of abdominal pain in the right lower quadrant for one week. He had undergone an upper intestinal series and double-contrast barium enema to investigate the etiology of his chronic diarrhea three months previously, and these had been reported as normal. An opacity was seen in the right lower quadrant, at the location of the appendix, on an abdominal X-ray (Fig. 1a). We reviewed the double-contrast barium enema performed three months earlier and saw that the

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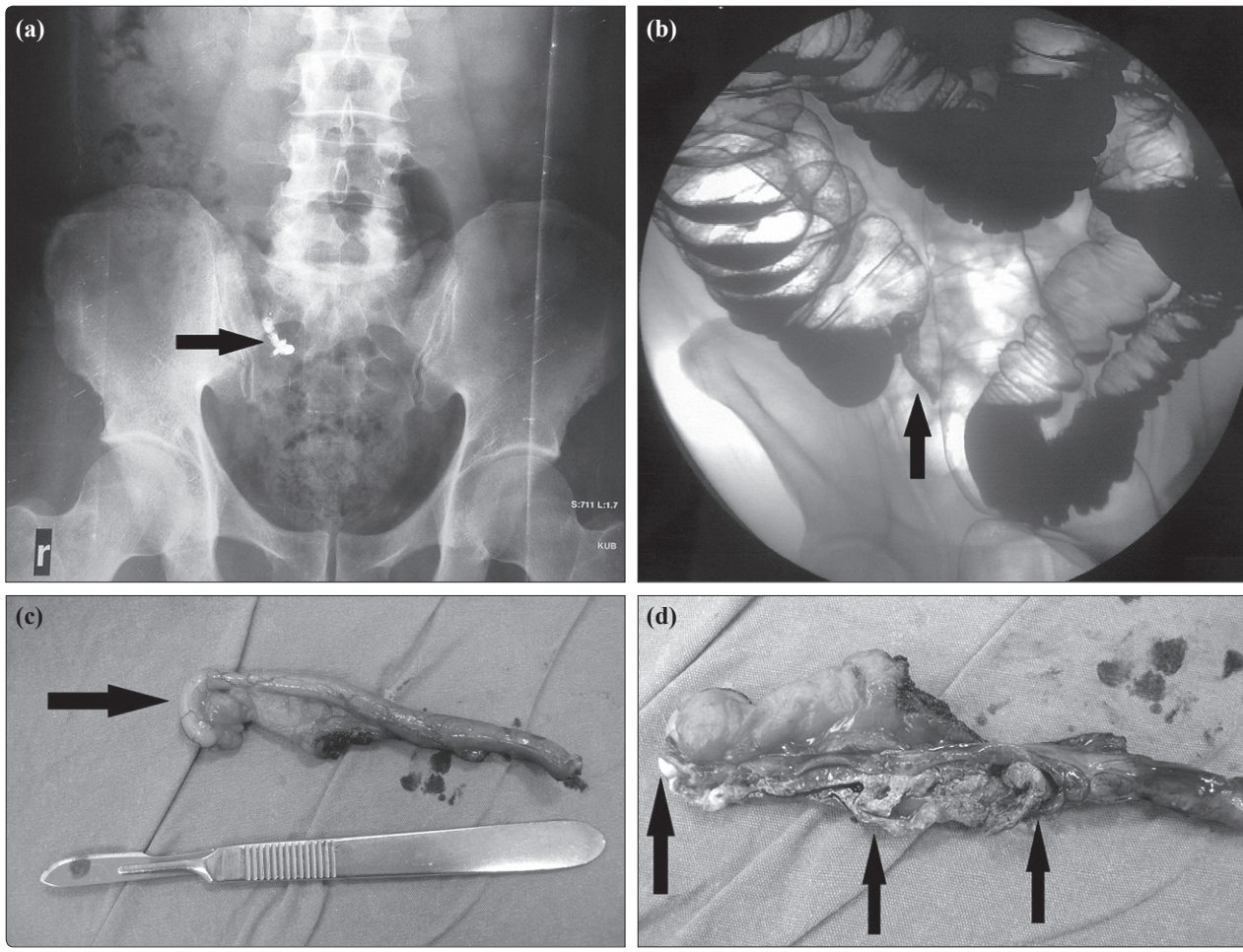

Fig. 1. **(a)** Appearance of the appendix on the abdominal X-ray. **(b)** The appendix is filled with barium during the double-contrast barium enema. **(c)** The appendix is hyperemic and erectile, with a barolith in the distal part. **(d)** The appearance of the barolith and fecalith in the cut appendix.

appendix had been filled with barium (Fig. 1b). The patient was admitted with a diagnosis of acute appendicitis. On physical examination, the patient's vital signs were stable, but he had tenderness, rigidity, and rebound in the right lower quadrant of the abdomen. There were no abnormalities on laboratory testing, so a laparotomy was performed. The appendix was hyperemic and erectile, and a barolith was palpable in the distal section (Fig. 1c). An appendectomy was performed. When the specimen was cut, a barolith was seen in the distal part and a fecalith proximally (Fig. 1d). The postoperative follow-up was uneventful, and the patient was discharged on postoperative day 1.

DISCUSSION

The appendix fills with barium and the entire appendix is visualized in 80-90% of barium swallow or enema studies, and this is accepted as a reliable sign of a non-diseased appendix.[2] Post-examination retention of barium in the appendix is very common (90-95%), and 10% of the patients retain barium in the appendix beyond 72 hours.[3] The interval between a barium study and the presentation of barium appendicitis ranges from four days to four years.[4] If the barium is retained for more than two months, complicated appendicitis can result.[5,6]

The spontaneous evacuation of barium from the appendix in children may take longer than in adults.[6] Patients on a low-residue diet suffering from dehydration have altered colonic motility and are at potential risk of barolith obstruction.[6] In our case, despite increased colonic motility, the barium was retained in the appendix and acute appendicitis developed three months after the examination.

An appendectomy is often performed in patients who present with symptoms of acute appendicitis, regardless of a history of barium imaging. The literature discusses this topic, including the etiology of barium-induced appendicitis and when we should perform an appendectomy.

The pathogenesis of appendicitis due to barium is still unclear, but the consensus holds that inspissated barium triggers inflammation by narrowing or obliterating the appendix lumen, like an appendicolith, and

causes appendicitis or appendix perforation.[1-5] Barium is inert and has little physiological effect on the gastrointestinal tract, so inflammation triggered via chemical irritation is not a more likely possibility.

An appendectomy is not recommended for every patient who has prolonged retention of barium in the appendix; they may be followed unless they become symptomatic.[2,5,6] These patients should be followed closely because the risk of developing complications increases with the duration of barium retention. In our case, the laboratory parameters were normal, while the physical examination was suggestive of acute appendicitis. Consequently, an appendectomy was performed.

In conclusion, after barium studies, patients should be informed regarding possible retention of barium in the appendix, which can cause acute appendicitis. Thus, if abdominal pain develops, the patient can be referred quickly to a medical center for the appropriate treatment, and the complications of acute appendicitis can be prevented with early intervention.

Conflict-of-interest issues regarding the authorship or article: None declared.

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