



A Giant Appendicolith Causing Complicated Appendicitis: A Case Report

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ABSTRACT

Background: Appendicoliths are calcified masses within the appendix and may cause obstruction, acute appendicitis, perforation, and abscess formation. Giant appendicoliths measuring more than 2 cm are rare. This case highlights a giant appendicolith presenting with complicated acute appendicitis.

Methods: An 81-year-old male presented to the emergency department with sudden-onset lower abdominal pain for four days, associated with inability to pass flatus and stools, loss of appetite, and vomiting. Clinical examination, laboratory investigations, abdominal X-ray, and non-contrast computed tomography were performed for evaluation.

Results: Examination revealed abdominal distension, right lower quadrant tenderness, and generalized guarding. Laboratory investigations showed a white blood cell count of 15,000/mm³, blood urea of 134 mg/dL, and serum creatinine of 4.3 mg/dL. Abdominal X-ray demonstrated a radiopaque shadow in the right lower quadrant. Non-contrast CT revealed a 2.5 cm appendicolith with appendiceal wall thickening and surrounding inflammation. The patient received intravenous fluids, analgesics, piperacillin-tazobactam, and metronidazole, followed by exploratory laparotomy. Intraoperatively, 150 mL of pus, a retrocecal appendix with a large appendicolith, and rupture at the appendiceal base were identified. Appendectomy and intraperitoneal drainage were performed. The patient improved clinically, the drain was removed on the third postoperative day, and he was discharged on the fourth postoperative day without complications. Histopathology confirmed appendicitis with periappendicitis.

Conclusion: A giant appendicolith can cause complicated acute appendicitis with perforation and peritonitis. Early recognition using appropriate imaging and timely surgical intervention are important for preventing serious complications and achieving favourable outcomes.

Key-words: Appendicular Perforation, Peritonitis, Giant Appendicolith, Acute Appendicitis

INTRODUCTION

Appendicitis is inflammation of the vermiform appendix and is one of the common surgical emergencies encountered in clinical practice. It is generally characterized by obstruction of the appendiceal lumen, which leads to accumulation of fluids and mucus within

the appendix and a progressive rise in intraluminal pressure ^[1]. As the obstruction persists, increasing pressure compromises lymphatic and venous drainage and subsequently reduces arterial blood flow to the appendiceal wall. These vascular changes may result in ischemia, inflammation, necrosis, and, if untreated, perforation of the appendix ^[2]. Appendiceal lumen obstruction may occur due to several causes, including lymphoid hyperplasia, appendicoliths, tumours, and foreign bodies, with obstruction playing a central role in the pathophysiology of acute appendicitis ^[1,2]. Among the various causes of appendiceal obstruction, appendicoliths are of particular clinical importance.

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Appendicoliths are calcified masses within the appendiceal lumen, generally formed by aggregation of inspissated faecal material and mineral deposits [3]. They may be detected incidentally in asymptomatic individuals but are also associated with acute appendicitis and its complications. Appendicoliths are reported in approximately 3% of the general population and in nearly 10% of patients with appendicitis [3]. An appendicolith measuring more than 2 cm is generally described as a giant appendicolith and is considered an uncommon finding [1,4].

The clinical significance of appendicoliths is related not only to their presence but also to their size and potential to produce persistent luminal obstruction. Larger appendicoliths may be associated with more severe inflammatory changes and an increased risk of complicated appendicitis. They have been reported more frequently among younger male patients and in patients with a retrocaecal appendix [4]. Although many appendicoliths remain asymptomatic, they may occasionally be associated with intermittent or chronic abdominal pain [3]. They can also produce colicky abdominal pain, which may create diagnostic difficulty and necessitate consideration of other causes, including urolithiasis, in the differential diagnosis [3].

The presence of an appendicolith in a patient with acute appendicitis is clinically important because persistent obstruction may promote progression from uncomplicated inflammation to ischemia, gangrene, perforation, and abscess formation. The reported prevalence of perforation and abscess formation in appendicitis associated with appendicoliths ranges from 39.4% to 50% [5]. Giant appendicoliths may therefore represent a particular challenge because of their potential association with complicated disease. In selected asymptomatic patients, conservative management may be considered; however, symptomatic patients or those presenting with acute appendicitis require careful assessment and appropriate intervention [1].

Imaging plays an important role in identifying appendicoliths and assessing associated appendiceal inflammation. A plain abdominal radiograph may occasionally demonstrate a radiopaque structure in the right lower quadrant, although such a finding can mimic urinary or biliary calculi [6]. Ultrasonography may provide useful information but can be limited by bowel gas and

other technical factors. In patients with diagnostic uncertainty or suspected complications, computed tomography provides more comprehensive evaluation of the appendix, appendicolith, surrounding inflammatory changes, and complications such as perforation or abscess formation [5,6].

Management depends on the clinical presentation, severity of disease, presence of complications, and overall patient condition. While conservative management may be appropriate in selected patients, appendicolith-associated complicated appendicitis may require urgent surgical intervention. Laparoscopic appendectomy is generally an effective surgical approach, although open surgery may be required depending on the clinical circumstances and operative findings [3,5]. Therefore, early recognition of an appendicolith, appropriate imaging, careful assessment of disease severity, and timely treatment are important in preventing serious complications.

The present case describes an elderly patient with acute complicated appendicitis associated with a giant appendicolith, highlighting its unusual presentation, radiological identification, operative findings, and the importance of timely surgical management.

CASE PRESENTATION

An 81-year-old male, with no known past medical history and no history of previous surgeries, presented to the emergency department with a complaint of lower abdominal pain for the last 4 days associated with inability to pass flatus and stools. The pain had a sudden onset and gradually worsened, associated with loss of appetite and vomiting. On clinical examination, the abdomen was distended, with tenderness on deep palpation of the right lower quadrant of the abdomen and generalized guarding. Laboratory findings showed a haemoglobin (Hb) level of 12.4 g/dl, white blood cell (WBC) count of 15000/mm³ and differential leukocyte count (DLC) shows neutrophils-90, lymphocytes- 8, monophils- 1, basophils- 1, blood urea- 134mg/dl, serum creatinine- 4.3mg/dl. Subsequently, a plain abdominal X-ray was performed in an upright position, revealing a radiopaque finding in the right lower quadrant of the abdomen (Fig. 1). As the ultrasonography was inconclusive due to gaseous abdomen, the decision was made for the patient to undergo a non-contrast

computed tomography scan of the abdomen (because of deranged renal function) (Fig. 2).



Fig. 1: Plain X-ray Abdomen Showing a Radiopaque Shadow in the Right Lower Quadrant

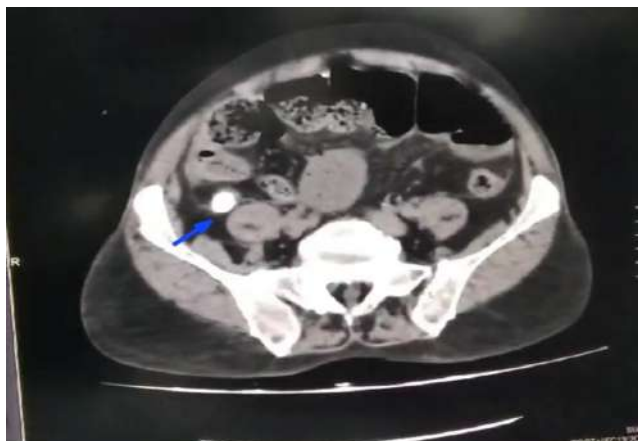


Fig. 2: Computed Tomography Image Showing a Giant Appendicolith

The results revealed the presence of an appendicolith in the lumen of the appendix, measuring approximately 2.5 cm, along with radiological findings consistent with acute appendicitis, including thickening of the appendiceal wall and inflammation of the surrounding visceral fat. The patient was initiated on intravenous fluid administration, analgesics, and antibiotic treatment with piperacillin-tazobactam and metronidazole.

After obtaining the patient's informed consent, an exploratory laparotomy was done. Intra-operatively, 150ml of pus was present in the peritoneal cavity with pus flakes over the small bowel. The Small bowel was grossly distended. The appendix was retrocecal in position with a large appendolith (~2.5 cm) and ruptured at the base (Fig. 3). Following appendectomy, an intraperitoneal drain was placed in the pelvis.



Fig. 3: Specimen of Inflamed Appendix with Appendicolith after Appendectomy

The patient responded well to treatment, with resolution of symptoms, normalization of laboratory parameters, and clinical improvement. On the third postoperative day, the drain output was minimal, and the abdominal drain was removed. The patient was discharged from the hospital on the fourth postoperative day in stable condition. The histopathology report showed appendicitis with periappendicitis. On follow-up, there were no complications.

DISCUSSION

Acute appendicitis is a common surgical emergency affecting approximately 7% of the general population and is frequently associated with obstruction of the appendiceal lumen by an appendicolith^[3]. Obstruction of the proximal appendiceal lumen produces a closed-loop obstruction, resulting in progressive accumulation of secretions and an increase in intraluminal pressure. Persistent elevation of luminal pressure compromises venous and lymphatic drainage and subsequently reduces arterial perfusion, leading to congestion, ischemia, gangrene, and, if unresolved, appendiceal perforation^[3,4]. The presence and characteristics of an

appendicolith are clinically important because larger appendicoliths and those located near the appendiceal base have been associated with an increased risk of complicated appendicitis [4]. In a recent large cohort, complicated appendicitis occurred more frequently in patients with an appendicolith than in those without one, and increasing appendicolith diameter was associated with greater disease severity.

The prevalence of perforation and abscess formation in appendicitis associated with appendicoliths has been reported to range from 39.4% to 50% [5]. Appendicoliths may occasionally be identified on plain abdominal radiographs as radiopaque structures in the right lower quadrant; however, these may be mistaken for renal or gallstones, creating a potential diagnostic dilemma [6]. Although plain radiography may provide an initial clue, its diagnostic value is limited. Ultrasonography (USG) is a useful non-invasive imaging modality, but visualization of the appendix may be limited by bowel gas, body habitus, retrocaecal location, or an atypical position of the appendix. Therefore, when USG findings are inconclusive or clinical and radiological findings do not correlate, computed tomography (CT) can provide a more comprehensive assessment of the appendix, appendicolith, periappendiceal inflammation, and complications such as perforation or abscess formation [7-10].

CT is particularly useful in patients with suspected complicated appendicitis because it can demonstrate appendiceal wall changes, periappendiceal fat stranding, free fluid, extraluminal air, collections, and the presence, size, and location of an appendicolith [7,10]. Identification of an appendicolith on CT is clinically relevant because it may influence the choice between operative and non-operative treatment. Recent evidence has demonstrated that appendicoliths are associated with an increased risk of complicated appendicitis, while larger appendicoliths and appendicoliths located at the appendiceal base may further increase this risk [9]. Thus, the radiological assessment should not be limited to simply documenting the presence of an appendicolith but should also consider its size, location, and associated inflammatory changes.

Giant appendicoliths represent an uncommon presentation and are generally described when the appendicolith measures more than 2 cm [1,4]. Although an incidentally detected giant appendicolith in an

asymptomatic patient may sometimes be managed conservatively, particularly when surgical risk is considered high, symptomatic patients presenting with acute appendicitis require careful assessment and timely management [11]. The decision should be individualized according to the clinical condition, severity of inflammation, presence of perforation or abscess, comorbidities, and operative risk. The present case was complicated by acute appendicitis with rupture and intra-abdominal pus, making emergency operative management appropriate.

There remains an ongoing discussion regarding open appendectomy (OA), laparoscopic appendectomy (LA), and non-operative management with antibiotics in acute appendicitis. Compared with OA, LA is generally associated with less postoperative pain, fewer wound infections, shorter hospital stay, and earlier return to normal activity, although the evidence also indicates a possible increased risk of intra-abdominal abscess in some patient groups [12]. Current guidelines generally support LA as the preferred surgical approach when appropriate expertise and resources are available [7]. However, open appendectomy continues to have an important role when laparoscopy is unavailable, contraindicated, or when operative findings and the patient's condition make an open approach more appropriate. In the present case, open appendectomy was performed because the patient had complicated acute appendicitis with appendiceal rupture and peritonitis.

Non-operative treatment with antibiotics has also been investigated as an alternative to immediate appendectomy in selected patients with uncomplicated appendicitis. However, the presence of an appendicolith is an important consideration when selecting patients for conservative treatment. In the CODA randomized trial, patients with appendicoliths who received antibiotics had higher rates of complications and subsequent appendectomy than those without appendicoliths [8]. Similarly, recent evidence indicates that appendicolith-associated appendicitis has a greater risk of treatment failure with non-operative management [8,9]. Therefore, while antibiotics may be considered in appropriately selected uncomplicated cases, the presence of an appendicolith requires greater caution.

The timing of surgical intervention is also important in patients with appendicolith-associated appendicitis. A



retrospective cohort study reported that appendicolith presence was independently associated with perforation and that patients with appendicoliths were more frequently found to have complicated appendicitis early during admission ^[11]. These findings support careful clinical monitoring and consideration of early operative management when clinical or radiological features suggest progression toward complicated disease. Nevertheless, treatment decisions should remain individualized rather than being based solely on the presence of an appendicolith.

In the present case, the giant appendicolith was identified on CT in the setting of acute appendicitis, followed by operative confirmation of a retrocaecal appendix with appendicolith and rupture at the base. The combination of advanced age, clinical features of intestinal obstruction, radiological evidence of a large appendicolith, and intra-abdominal infection emphasized the importance of timely diagnosis and surgical intervention. Overall, giant appendicolith-associated appendicitis requires careful integration of clinical findings, imaging, disease severity, and operative risk when determining the appropriate treatment strategy.

CONCLUSIONS

Patients with acute appendicitis with appendicolith can present with complications like appendiceal perforation and peritonitis. Computed tomography is the diagnostic tool of choice for patients with acute appendicitis with appendicolith, as it helps identify the appendicolith and assess the severity of appendiceal inflammation and complications. Timely surgical intervention should be performed to prevent serious complications, particularly in patients with perforation or peritonitis. Although appendicoliths may remain asymptomatic, their presence can increase the risk of acute appendicitis, perforation, and abscess formation. Giant appendicoliths are rare but may be associated with complicated appendicitis and require careful clinical assessment. The understanding of appendicoliths and their implications continues to evolve. This case reinforces the importance of early recognition, appropriate imaging, timely intervention, and an individualized, patient-centered approach in the management of appendicitis.

CONTRIBUTION OF AUTHORS

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