**Title page**

**Case of Giant Appendicolith: A Common Ailment With a Rare Finding.**

**Niranjan Thapa1\*, Oshan Shrestha1, Sunil Basukala2, Kala Shrestha1, Nabaraj Bhugai1, Niraj Joshi1, Shiva Kumar Regmi1 , Sagun Karki1, Suman Gurung3**

1 Nepalese Army Institute of Health Sciences, Kathmandu, Nepal

2Department of Surgery, Nepalese Army Institute of Health Sciences, Kathmandu, Nepal

Word count (excluding abstract and references): 1163

Figure count: 3

**\*Correspondence**

**Email:** [niranjan.thapa06@naihs.edu.np](mailto:niranjan.thapa06@naihs.edu.np)

**Phone:** +9779866041066

**Declarations:**

**Consent:** Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

**Conflict of interests:** No conflict of interests.

**Funding:** This article didn’t receive any grants.

**Ethical approval:** N/A

**Clinical trial registration:** N/A

**Data availability:** All the findings are present within the manuscript.

**Author’s contributions:**

Niranjan Thapa (PP) and Oshan Shrestha (OS) contributed to the conception and design of the study. NT, Kala Shrestha (KS) Nabaraj Bhugai (NB), Niraj Joshi (NJ), and Shiva Kumar Regmi (SKR) contributed to acquiring patients’ detailed information. NT performed the literature review and contributed to the initial manuscript drafting. Sagun Karki (SK), Suman Gurung(SG) and Sunil Basukala (SB) guided throughout the study and edited intellectually. All authors were involved in drafting and revising the manuscript and approved the final version.

**Author’s information:**

**NT** Nepalese Army Institute of Health Sciences, Kathmandu-44600, Nepal

**Email:** [niranjan.thapa06@naihs.edu.np](mailto:niranjan.thapa06@naihs.edu.np)

ORCiD: 0000-0001-9043-3368

**OS** Nepalese Army Institute of Health Sciences, Kathmandu-44600, Nepal

**Email:** [shresthaoshan93@gmail.com](mailto:shresthaoshan93@gmail.com)

ORCid: 0000-0002-8655-9168

**SB** Department of Surgery, Nepalese Army Institute of Health Sciences, Kathmandu-44600, Nepal

**Email:** [sunil.basukala@naihs.edu.np](mailto:sunil.basukala@naihs.edu.np)

**KS** Nepalese Army Institute of Health Sciences, Kathmandu-44600, Nepal

**Email:** [kalasth04@gmail.com](mailto:kalasth04@gmail.com)

**NB** Nepalese Army Institute of Health Sciences, Kathmandu-44600, Nepal

**Email:** [nabarajbhugai@gmail.com](mailto:nabarajbhugai@gmail.com)

**NJ** Nepalese Army Institute of Health Sciences, Kathmandu-44600, Nepal

**Email:** [imniraj95@gmail.com](mailto:imniraj95@gmail.com)

**SKR** Nepalese Army Institute of Health Sciences, Kathmandu-44600, Nepal

**Email:** [shivkeshab6@gmail.com](mailto:shivkeshab6@gmail.com)

**SK** Nepalese Army Institute of Health Sciences, Kathmandu-44600, Nepal

**Email:** [sagunrise12@gmail.com](mailto:sagunrise12@gmail.com)

**SG** Department of Pathology , Nepalese Army Institute of Health Sciences, Kathmandu-44600, Nepal

**Email:** [kathmandu38@gmail.com](mailto:kathmandu38@gmail.com)

**Abstract**

Acute appendicitis is one of the most prevalent causes of acute abdomen. Although the precise cause of appendicitis is unknown, appendicoliths are a common etiology, and the concept of luminal obstruction is widely accepted. Appendicoliths are mineralized deposits that are typically less than 1 cm in diameter and are found inside the appendiceal lumen. Giant appendicoliths are rare appendicoliths with the largest diameter of more than 2 cm. We present a case of a young male with an uncommon definitive pathology diagnosis for a right iliac fossa calcification that may be indicative of a gallstone ileus in the setting of an acute abdomen with a rare trans operative finding.

**Keywords:** Appendicitis, Appendicolith, Fecalith, Abdominal Calcification

1. **Introduction**

Appendicitis is one of the most common causes of emergency surgery accounting for all surgical operations. The diagnosis is based largely on clinical judgment however, laboratory values and radiologic imaging are often used to increase diagnostic accuracy. (1) Appendicular lumen obstruction either by lymphoid hyperplasia appendicoliths, tumours, or foreign bodies explains the pathophysiology of acute appendicitis in most cases. This results in a rise in intraluminal pressure, the collapse of lymphatic vessels, collapsed veins and decreased arterial flow, and consequently, leads to necrosis and perforation. (2,3)

Appendicolith is a mass formed by the concretion of calcified deposits in the appendix made of packed stool and occasionally mineral deposits. Appendicoliths are present in 3% of the general population and 10% of appendicitis cases. Appendicoliths are more common in male patients under 35 years of age, with retrocaecal appendix. (4–6) Most cases of appendicoliths are asymptomatic. However, it represents a well-known cause of acute appendicitis, the reason for intermittent chronic abdominal pain, and is associated with an increased risk of perforation or abscess formation. (7–9) It may also present as a colicky pain, in which urolithiasis may be considered a differential diagnosis. (10)

Appendicolith is termed a giant when it is more than 2cm in size and is extremely rare. (11,12)

A case of a giant appendicolith is presented within the context of an acute abdomen. This case report is in line with CARE guidelines. (13)

1. **Case report**

A 21-year-old Hindu male with no known co-morbidities presented to the Shree Birendra Hospital (SBH) Emergency Department with a complaint of pain abdomen for 1 day. The pain initially started in the umbilical region and migrated to the Right Iliac Fossa (RIF). It was acute in onset, pricking, and continuous which was relieved under painkillers, associated with 2 episodes of non-projectile, non-bile stained, and non-blood-stained vomiting, with vomitus being food particles. The patient has no history of fever or change in bowel and bladder habits. He was otherwise well with no significant past medical or surgical history or family history.

On physical examination, his general condition was fair, and his vitals were within normal range. The abdomen was soft, with tenderness and rebound tenderness present over RIF, non-distended with guarding present. The Psoas test, Obturator test, and Rovsing sign were negative. The modified ALVARADO score was 7/9. Heart sounds and lung fields were unaltered, and the patient was grossly neurologically intact.

* 1. **Diagnostic assessments**

Complete blood count: on admission, the WBC was 15\*10^3(N = 88%) which was raised to 17\*10^3 (N=90%) after 7 hours and then after 2 days it was 10.8\*10^3 (N = 84.1%). Hemoglobin within normal limit

Ultra Sonography (Focused scan of RIF and Right Hypochondriac Region): Dilated tubular, thick-walled structure with echogenic thick content and calculus of approx. 16 mm in size with diffuse surrounding inflammatory changes.

CECT (A+P): The appendix is well distended, measuring 26mm in diameter and 6.5 cm in longitudinal dimension. There is a mild post-contrast enhancement of the appendicular wall. A fecalith measuring up to 18 mm in longitudinal dimension is seen within. A bubble of gas is seen within towards the tip. Peri-appendicular inflammation is seen in the form of fat stranding, and minimal fluid. Few edematous bowel loops are seen in superior aspects. Overall, an ill-defined lump measuring 2.6\*4.0\*4.7 cm is forming in RIF.

Renal Function Tests: All within normal limits

Liver Function Tests: all within normal limits with slightly raised ALP

**Treatment**

The patient was initially managed in ER, he was kept Nil Per Oral (NPO) and fluid was managed by Normal Saline. Pain managed by Hyoscine butyl bromide, along with Pantoprazole. Ceftriaxone and Metronidazole IV were the antibiotics given. And the patient was shifted to the ward and managed conservatively with Ceftriaxone, Paracetamol, Metronidazole and Pantoprazole. Fluids being given were Dextrose NS and Ringer Lactate over 24 hours and kept under observation until the confirmation of appendicitis.

After the reports of Focused USG and CECT, the diagnosis was made i.e., Acute appendicitis and for which emergency appendectomy was done under spinal anesthesia, and the specimen was sent for Histopathological examination. **(Figure 1)**

Intraoperative findings were: Retrocecal Appendix of approximately 7 cm in length, healthy base with an inflamed tip, and appendicolith of approximately 2cm in length **(Figure 2 & 3)**. He was kept under observation in the post-operative ward and kept NPO for 6 hours following the surgery and then shifted to the ward after 12 hours. He started on a liquid diet after 6 hours and tolerated it well.

* 1. **Follow up.**

He was discharged with Antibiotics (Cefixime and Metronidazole), Paracetamol, and Pantoprazole after 72 hours only after the pain resolved and he made full recovery. The patient was advised for alternate day dressing with suture out on the 10th postoperative day. No adverse events were countered during his follow-ups.

1. **Discussion**

Appendicoliths are solid deposits within the appendiceal lumen that are composed of fecal matter and mineral deposits. (14) They are usually less than 1 cm in size. If their size is greater than 2 cm, then they are termed giant appendicoliths. (14) The giant appendicolith reported in the literature was 3.5 cm in diameter in a patient with Crohn's disease and stump appendicitis.

In several studies, appendicoliths have been reported as the cause of 20–40% of acute appendicitis. It usually occurs in male patients under 35 years of age who have a retrocecal appendix.(15) The obstruction of the proximal appendiceal lumen results in closed-loop obstruction, which leads to an increase in luminal pressure. This increase in luminal pressure can lead to a series of events, from congestion and ischemia of the appendiceal wall to gangrene and perforation if unresolved. (16) The prevalence of perforation and abscess formation in appendicitis associated with appendicoliths is 39.4 – 50 %. (16)

It may also have an atypical presentation with symptoms like colicky pain, which may be confused with urolithiasis. The diagnosis of appendicitis is based on clinical findings, but laboratory investigations and radiological imaging studies are often used to increase diagnostic accuracy. In various studies, appendicoliths were suggested to have 100 percent specificity for the diagnosis of acute appendicitis, although some researchers have demonstrated the possibility of an appendicolith without acute appendicitis. The finding of an appendicular stone in CT has a 65 percent sensitivity, an 86 percent specificity, and a 74% positive predictive value for acute appendicitis diagnosis. (15)

There is a debate between open appendectomy (OA) or laparoscopic appendectomy (LA) versus non-surgical management with antibiotics for the treatment of appendicitis. But various studies have found that patients treated with non-operative management for appendicitis associated with an appendicolith have a higher rate of complications.(16) To those findings, we were able to safely manage our patient with an open appendectomy with no short-term morbidity.

1. **Conclusion**

The case of giant appendicoliths is rare and their clinical presentation can sometimes be not so apparent. However, when complicated, they can associate acute appendicitis with the risk of perforation, for which emergency appendectomy is preferred.

**Patient perspective:** The patient was anxious about his health condition but was assured that he would get better after the operation. The patient was positive and had come for the follow-up.

**Consent of the patient:**

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

**Author’s contributions:**

Niranjan Thapa (PP) and Oshan Shrestha (OS) contributed to the conception and design of the study. NT, Kala Shrestha (KS) Nabaraj Bhugai (NB), Niraj Joshi (NJ) and Shiva Kumar Regmi (SKR) contributed to acquiring patients’ detailed information. Niranjan Thapa performed the literature review and contributed to initial manuscript drafting. Sagun Karki (SK), Suman Gurung(SG) and Sunil Basukala (SB) guided throughout the study and edited intellectually. All authors were involved in drafting and revising the manuscript and approved the final version.

References:

1. Pahissa RA, Lin-Hurtubise KM. Giant appendicolith: A case report and review of the literature. Military Medicine. 2020;185(9–10):E1851–3.

2. Flum DR. Acute Appendicitis — Appendectomy or the “Antibiotics First” Strategy. New England Journal of Medicine. 2015;372(20):1937–43.

3. Petroianu A, Villar Barroso TV. Pathophysiology of Acute Appendicitis. JSM Gastroenterology And Hepatology. 2016;4(3):4–7.

4. Kaya B, Eris C. Different clinical presentation of appendicolithiasis. The report of three cases and review of the literature. Clinical Medicine Insights: Pathology. 2011;(4):1–4.

5. Singh JP, Mariadason JG. Role of the faecolith in modern-day appendicitis. Annals of the Royal College of Surgeons of England. 2013;95(1):48–51.

6. Engin O, Muratli A, Ucar AD, Tekin V, Calik B, Tosun A. The importance of Fecaliths in the aetiology of acute appendicitis. Chirurgia (Romania). 2012;109(6):756–60.

7. Grimes C, Chin D, Bailey C, Gergely S, Harris A. Appendiceal faecaliths are associated with right iliac fossa pain. Annals of the Royal College of Surgeons of England. 2010;92(1):61–4.

8. Jones BA, Demetriades D, Segal I, Burkitt DP. The prevalence of appendiceal fecaliths in patients with and without appendicitis. A comparative study from Canada and South Africa. Annals of Surgery. 1985;202(1):80–2.

9. Vyas RC, Sides C, Klein DJ, Reddy SY, Santos MC. The ectopic appendicolith from perforated appendicitis as a cause of tubo-ovarian abscess. Pediatric Radiology. 2008;38(9):1006–8.

10. Teke Z, Kabay B, Erbiş H, Tuncay ÖL. Appendicolithiasis causing diagnostic dilemma: A rare cause of acute appendicitis (report of a case). Ulusal Travma ve Acil Cerrahi Dergisi. 2008;14(4):323–5.

11. Ishiyama M, Yanase F, Taketa T, Makidono A, Suzuki K, Omata F, et al. Significance of size and location of appendicoliths as exacerbating factor of acute appendicitis. Emergency Radiology. 2013;20(2):125–30.

12. Scroggie DL, Al-Whouhayb M. Asymptomatic giant appendicolith managed conservatively. Journal of Surgical Case Reports. 2015;2015(11):rjv149.

13. Riley DS, Barber MS, Kienle GS, Aronson JK, Schoen-Angerer T von, Tugwell P, et al. CARE guidelines for case reports: explanation and elaboration document. Journal of Clinical Epidemiology. 2017 Sep 1;89:218–35.

14. Rampersad CA, Rampersad FS, Ramraj PR, Seetahal VV. Case of a Giant Appendicolith. Cureus. 2022 Feb;14(2):e22034.

15. Giant Appendicolith in Acute Exacerbation of Chronic Appendicitis: Case Report and Literature Review [Internet]. [cited 2023 Mar 23]. Available from: https://www.scirp.org/journal/PaperInformation.aspx?PaperID=80365

16. Pahissa RA, Lin-Hurtubise KM. Giant Appendicolith: A Case Report and Review of the Literature. Military Medicine. 2020 Sep 18;185(9–10):e1851–3.