



ISSN: 2091-2749 (Print)  
2091-2757 (Online)

#### Correspondence

Dr. Saroj Dhital  
Department of Surgery,  
Kathmandu Model Hospital,  
Kathmandu, Nepal

Email: drsdhital@gmail.com  
Phone: +977-9851033101

#### Peer Reviewers

Dr. Jay N Shah  
Patan Academy of Health  
Sciences

Dr. Ashis Shrestha  
Patan Academy of Health  
Sciences

## Appendicoliths: the neglected stones

Saroj Dhital, Udaya Koirala, Bijendra Dhoj Joshi, Amit Mani Upadhyaya, Arbin Joshi

Department of Surgery, Kathmandu Model Hospital, Kathmandu, Nepal

### ABSTRACT

**Introductions:** Cases of colic of the vermiform appendix have been rarely described or diagnosed. Appendicoliths cause acute appendicitis and appendicular perforation. It is still not clear whether appendicoliths cause appendicular colic in the absence of acute appendicitis.

**Methods:** A cross sectional study that included appendectomy done for recurrent appendicitis or chronic right iliac fossa pain. Histology reports were reviewed. The presence of an appendicolith in the report was noted.

**Results:** Thirty-two cases of recurrent appendicitis and chronic right iliac fossa pain were included. Twenty-four patients (75%) had fecoliths in the histology specimens. Eight patients (25%) who presented with appendicular colic without signs of appendicitis were further evaluated.

**Conclusions:** Majority of patients with chronic or colicky right iliac fossa pain had appendicoliths.

**Keywords:** appendicoliths, chronic right iliac fossa pain, recurrent appendicitis

## INTRODUCTIONS

Appendicitis is the most common indication for emergency laparotomy. Although its etiology is controversial, in the majority of patients, appendicitis is thought to be provoked by obstruction of the appendiceal lumen caused by fecolith impaction, lymphoid hyperplasia, or other processes.<sup>1</sup>

The formation of true calculi within the lumen of the vermiform appendix is uncommon. However, the condition is of clinical importance because of the frequency with which such calculi give rise to serious complications. Many patients who have appendiceal calculi present to clinician with features of appendicular colic without features of appendicitis. These patients are likely to be under diagnosed or misdiagnosed without proper management.

There is paucity of literature in this regard and as this condition is usually recognized post operatively, the recognition of this disease seems to be difficult clinically. We aim to analyze the presence of appendicoliths in patients with chronic right iliac fossa pain or chronic appendicitis.

## METHODS

A cross sectional study was done in the patients visiting the surgery department, Kathmandu Model Hospital, from March 2015 to October 2015. Patients with chronic pain in right iliac fossa or diagnosed as recurrent subacute appendicitis were included in the study. Patients with acute appendicitis were excluded. Clinical details and histology reports were collected prospectively. Clinical details were supplemented by selected case note review as needed. Pathology team was blinded for the study. We looked into the histopathology reports for mention of appendicolith, fecal sludge or concretions.

Working definition of chronic pain in right iliac fossa was pain localized to right iliac fossa in more than two separate occasions for more

than three months of duration. Recurrent appendicitis was defined as hospital admission with diagnosis of appendicitis at least once before the current episode.

## RESULTS

Out of 102 appendectomies 32 patients had chronic right iliac fossa pain or diagnosed as recurrent appendicitis. These 32 patients formed the sample size for this study. Age ranged from 16 to 65 years (mean 35), male (12) to female (20) ratio was 1:1.66. Twenty-four patients (75%) had clear fecoliths or fecal sludge or fecal concretions (Figure 1).

In eight patients with right iliac fossa colicky pain without signs of appendicitis, seven (87%) had appendicolith, (Table 1).

Laparoscopic appendectomy was done in 13 and open appendectomy in 19.

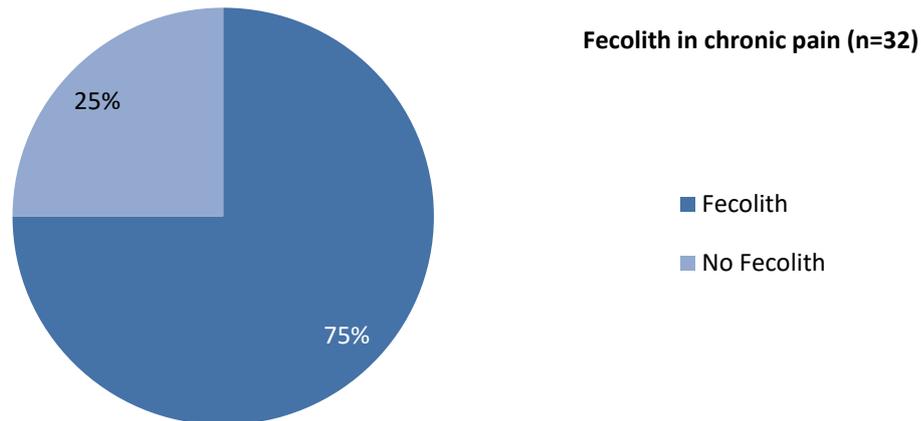
## DISCUSSIONS

In our study, 75 % (24 out of 32) patients with recurrent right iliac fossa pain or who were diagnosed with recurrent appendicitis had fecolith, which highlights the common occurrence of appendicoliths in our population.

Appendicolith is not commonly reported. It seems to have been neglected in diagnosis and management when comparing to other stone diseases. Some of the patients with appendicoliths have a difficult time for the proper diagnosis of the disease. Approximately 10% of patients with acute appendicitis have a radiographically visible appendicolith. One third of surgically removed appendix, contain an appendicoliths and commonly found in necrotic appendicitis and perforation.<sup>2</sup> The colicky pain may be part of the presentation but it is rarely seen as the main presenting complaint.<sup>3,4</sup> These patients are often subjected to a bunch of investigations, and end up moving from one center to another in search of proper management of their pain.

**Table 1. Presence of fecolith in patients with appendicular colic (n=8)**

Findings	N	Percentage
Male	2	25%
Female	6	75%
Age range years	16-36	
Fecolith	7	87%
Stricture	1	13%
Improvement after appendectomy	8	100%

**Figure 1. Presence of fecolith in patients with chronic appendicitis**

It is the accepted theory of the pathogenesis of appendicitis that it results from obstruction followed by infection. Fecal debris becomes entrapped in the appendiceal lumen and may precipitate with organic salts to form an appendicolith. Once an appendicolith reaches a critical diameter, it obstructs the appendiceal lumen, which causes luminal stasis, increasing intraluminal pressure, and eventually, vascular thrombosis, transmural necrosis, and perforation.

In 1742, Santorini studied the anatomy of the appendix and his descriptions were accompanied by illustrations of fecal concretions and worms which were found in some of his specimens.<sup>5</sup> Wegeler in 1813 used the term “calculosi concrementi” to describe hard fecal concretions, resembling gall-stones, which he found in the lumen of the appendix.<sup>6</sup> Forbes found calculi in 29 out of 1,800 vermiform appendices removed at operation.<sup>7</sup> As quoted by Collins,<sup>5</sup> Hancock, first English surgeon to operate on appendix, found the

lumen of the appendix obstructed by two concretions, and Weisfiog in 1906 preoperatively diagnosed appendicular calculus.

Appendiceal lithiasis are considered to be strong indicators of appendicitis and the complications of appendicitis.<sup>2</sup> Some authors emphasize preventive appendectomy for appendicoliths as they appear cause acute appendicitis, especially complicated appendicitis (perforation and abscess).<sup>8</sup> Giuliano<sup>3</sup> suggested that chronic appendicitis should be included in the differential diagnosis of chronic right lower quadrant pain in patients seen in the emergency room setting. Surgery is curative in such patients, although expectant management is an alternative when tolerated by the patient.

Eight of our patients had colicky right iliac fossa pain without associated features of acute appendicitis. They had already visited at least three other specialists or hospitals before

coming to our hospital. Most of the time clinically they were diagnosed as ureteric colic. Symptoms of these patients easily disappeared with or without analgesic injections before or after coming to emergency department. All investigations including total count, differential count, urine routine and culture, repeated ultrasound of abdomen and pelvis with full bladder were within normal limits. Even CT abdomen and pelvis was normal in one of the patient. Colonoscopy was done in four patients showing normal findings. Diagnostic ureterorenoscopy was done in two patients. All those investigations were normal.

Out of these eight patients, five were subjected to diagnostic laparoscopy and laparoscopic appendectomy. Seven out of these eight patients had appendiceal lithiasis while one had luminal stricture. Preoperative symptom completely resolved in all these patients after appendectomy.

Patients with appendicoliths may only present as appendicular colic without signs of inflammation or infection and all available investigations may appear normal in these patients posing the difficulty for diagnosis. Even diagnostic laparoscopy may show the normal looking appendix and could have fecolith inside.

Some limitations of this study include lack of data and information like preoperative diagnosis of appendicoliths in patient with recurrent appendicitis or appendicular colic, and incidence of gangrenous or perforated appendix in these patients. Short duration and small sample size were other limitations of the study.

Appendicoliths creates diagnostic dilemma in most of the right iliac fossa pain. Clinicians should be more aware of neglected calculi.

## CONCLUSIONS

Among chronic right iliac fossa pain, appendicoliths were seen in 21.87% (7 of 32) and 87% (7 out of 8) with colicky pain in right iliac fossa.

## REFERENCES

1. Swischuk LE, Chung DH, Hawkins HK, Jadhav SP, Radhakrishnan R. Non-fecalith-induced appendicitis: etiology, imaging, and pathology. *Emergency radiology*. 2015 Dec;22(6):643-9. DOI: <http://dx.doi.org/10.1007/s10140-015-1338-1>
2. Izzo L, Riccardi S, Marini M, et al. Appendiceal lithiasis: case report and review of literature. *G Chir*. 2004;25(11-12):398-401. Available from: <https://www.ncbi.nlm.nih.gov/labs/articles/15803814>
3. Giuliano V, Giuliano C, Pinto F, Scaglione M. Chronic appendicitis "syndrome" manifested by an appendicolith and thickened appendix presenting as chronic right lower abdominal pain in adults. *Emergency radiology*. 2006 Mar;12(3):96-8. DOI: <https://doi.org/10.1007/s10140-005-0452-x>
4. Fraser N, Gannon C, Stringer MD. Appendicular colic and the non-inflamed appendix: fact or fiction? *European journal of pediatric surgery*. 2004 Feb;14(01):21-4. DOI: <http://dx.doi.org/10.1055/s-2004-815775>
5. Collins DC. Historic Phases of Appendicitis. *Ann Surg*. 1931 Aug;94(2):179-96. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1391465/pdf/annsurg00649-0020.pdf>
6. Wegeler F. Historia enteritidis malignae et Singularis calculosi concrementi. *J. Med. Chir. Pharm*. 1813;28:384-91. (Quoted by Collins 1931).
7. Forbes GB, Lloyd-Davies RW. Calculous disease of the vermiform appendix. *Gut*. 1966 Dec;7(6):583. DOI: <http://dx.doi.org/10.1136/gut.7.6.583>
8. Nitecki S, Karmeli R, Sarr MG. Appendiceal calculi and fecaliths as indications for appendectomy. *Surg Gynecol Obstet*. 1990 Sep;171(3):185-8. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/2385810>