Case Report:
Imaging-Guided Localization for Surgical Retrieval of a Rare Complicated Retained Appendicolith

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Abstract

Background: Retained appendicolith related abscess formation is rare and carries challenging management options. We describe a unique case of a patient who presented with right upper quadrant pain tenderness that is clinically mimicking acute cholecystitis which turned out to be a perihepatic abscess caused by a dropped migrated appendicolith two and half years following a laparoscopic appendectomy.

Aims: To report a case of a perihepatic abscess complicating migrated appendicolith after laparoscopic appendectomy and stress the importance of imaging-guided localization for surgical planning.

Case Report: On January 2012, a 34-year old male patient presented to Montreal General Hospital, Montreal, Quebec, Canada, with a right upper abdominal pain, fever and mild shortness of breath. On physical examination, he was hemodynamically stable, but febrile of 38.9°C. Abdominal examination revealed right upper quadrant tenderness otherwise unremarkable. Blood tests resulted in elevated white blood cells count (16x10^3/µL). Abdominal ultrasound showed normally appearing gallbladder with an unexplained perihepatic collection containing internally air locules and an 8 mm radiopaque appendicolith. Review of his previous imaging revealed a retained appendicolith at right subdiaphragmatic space. The abscess was immediately drained and the patient came back 6 months later for surgical retrieval of this appendicolith after ultrasound guided localisation.

Conclusion: Dropped appendicolith related complication has increased since the introduction of laparoscopic appendectomy. Therefore, it should be suspected in cases of unexplained intraperitoneal abscess formation. Imaging guided localization can ease surgical retrieval.

Key Words: Retained – Dropped appendicolith – Perihepatic abscess.

Introduction

APPENDECTOMY is among the most common emergency surgical procedures worldwide. Intraluminal appendicolith is present in up to 47% to 65% of acute appendicitis in different age groups [1,2]. Appendicolith contains inspissated feces with some mineral deposits where it can result in luminal obstruction and eventually acute mucosal inflammation of the appendix. Recent literature proved that the appendicolith is no longer a 100% specific sign for acute appendicitis as high as 2% of asymptomatic individuals have appendicolith on routine abdominal CT [2].

Although laparoscopic appendectomy is becoming increasingly popular, it is associated with higher chances of postsurgical abscess formation and retained appendicolith.

Case Report

In January 2012, during the researcher’s 2-year “Non-Vascular Intervention and Body MRI” Fellowship at McGill University Health Centre, in Canada, a 34-year-old male patient presented to the Emergency Room of Montreal General Hospital, Montreal, Quebec, with a right upper abdominal pain and mild shortness of breath. He was not known to have significant past medical history apart from laparoscopic appendectomy two and half years earlier.

On physical examination, he was hemodynamically stable, but febrile of 38.9°C. Abdominal examination revealed right upper quadrant tenderness. Blood tests resulted in elevated white blood count of 16x10^3/µL.

Abdominal ultrasound was performed to rule out acute cholecystitis which revealed normally appearing gallbladder with an unexplained 3.7x2.6 cm perihepatic collection containing internally air...
locules and an 8mm radiopaque structure with posterior shadowing (Fig. 1A,B). Fortunately, his previous appendicitis was diagnosed on CT prior to the laparoscopic appendectomy that contained a 0.8cm appendicolith. Additionally, 2 days post-operatively, a follow-up CT (GE LightSpeed VCT 64) was performed to rule abscess formation which was negative. However, the appendicolith has not been removed and migrated to the right subdiaphragmatic space, where it remained till current presentation. Therefore, a diagnosis of “retained migrated appendicolith” was established.

The case was then discussed with the managing surgical team. Due to the high location of the abscess and the active inflammatory process, the plan started with immediate percutaneous drainage under ultrasound guidance and then to be followed-up with CT. The follow-up CT confirmed residual appendicolith with surrounding minimal inflammatory phlegmon (Fig. 1 C). The patient was then discharged for elective open surgical removal of the retained appendicolith with ultrasound guide localization.

Six months later, the patient came to the ultrasound division where ultrasound guided localization of the appendicolith was performed using Harpoon needle (Fig. 1D). A reasonable safe surgical approach via a lower lateral intercostal space was chosen and under sterile condition the Harpoon needle was advanced carefully under ultrasound guidance with its tip hooked deeper to the appendicolith. The patient then was shifted to the theatre, where the surgeon followed the hooked needle and the appendicolith was successfully extracted without complication. The patient was sent home one day later in a good health and was seen in the clinic 3 months later free of symptoms.

**Fig. (1 A):** US scan shows a 3.7-cm abscess in right perihepatic space scalloping the adjacent liver capsule. Arrow points to the 6-mm echogenic focus with posterior shadowing, represents the retained appendicolith.

**Fig. (1B):** US scan high resolution image shows multiple echogenic locules with ring down artefact representing pockets of air (arrow heads) within the abscess cavity (asterisk).

**Fig. (1C):** CT scan follow-up after percutaneous drainage demonstrates persistent appendicolith in a small residual inflammatory phlegmon.

**Fig. (1D):** US scan shows Harpoon wire (thin long arrow) has been deployed at the surface of the liver deeper to the appendicolith (thick arrow).
Discussion

Laparoscopic appendectomy is now widely increasing as an alternative treatment of acutely inflamed appendix. Although the overall postsurgical course is quite better than the traditional open approach, there appears to be two postoperative complications that can occur with greater frequency. One is the dropped appendicolith, and the other is abscess formation, because of higher rupture rate during surgical extraction. The abscess formation has been reported to be five folds compared to conventional open surgery [3,4].

Retained appendicolith is a well-known post-appendectomy complication. It may be increasing in incidence with laparoscopic minimally invasive surgery. It is rare with less than 40 cases of dropped appendicolith in the English literature [3]. Dropped appendicolith may occur secondary to ruptured appendix or during intraoperative manipulation which has increased with laparoscopic appendectomy. Abscess formation related to appendicolith may occur few days to several years after appendectomy [3].

Appendicoliths and related abscess formation are mostly identified in the right side of the peritoneal cavity, including pericecal region, Morrison’s pouch, perihepatic, pelvis and abdominal wall [3]. Computed tomography scan is the most accurate imaging modality detecting such small retained focus. In a symptomatic patient it is typically associated with abscess formation. Correlation between the preoperative imaging, especially CT, and the postoperative scans has been found helpful to exclude retained appendicoliths [3].

Treatment options for symptomatic dropped appendicoliths include open or laparoscopic surgery. Pre-surgical localization has been reported in a single study using Kopans Hookwire under CT guidance [8]. In our patient, ultrasound guided localization was performed using Harpoon needle. A successful percutaneous retrieval of a dropped appendicolith has been described using balloon via pre-existing sinus and using a stone basket has been described in single patient [3,6].

It seems that dropped appendicoliths are increasingly reported corresponding to the wider use of laparoscopic appendectomy as an alternative for open surgery. Several papers have suggested that percutaneous abscess drainage, as an initial approach, before final planning of appendicolith removal due to the surrounding inflammatory changes [3,7].

We encourage radiologist to search carefully the postoperative CT as dropped appendicoliths can be seen in postoperative imaging, which can explain the unusual presentation of abdominal abscess. Also using imaging guided localization could play a role in localizing appendicolith prior to definitive surgical retrieval which can help surgical approach particularly in hidden regions.

References