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Hepatic abscess: An uncommon complication after laparoscopic appendectomy



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Hepatic abscess: An uncommon complication after laparoscopic appendectomy

AIM: Laparoscopic appendectomy is currently the treatment of choice for acute appendicitis in emergency setting. When appendicitis is clinically suspected, an appendicolith can be found in 30% of the patients. Retained or dropped appendicoliths are an uncommon complication that may occur as a consequence of stone expulsion from the appendix, before or during laparoscopic appendectomies. This is very rare with only 30 reported cases of intra-abdominal abscess secondary to an appendicolith in the literature over the past 40 years. The objective of this case report is to illustrate an intrahepatic localization of a dropped appendicolith causing liver abscess.

CASE PRESENTATION: A 23-year-old female was admitted to the emergency department of our hospital for an acute appendicitis with coprolite obstructing the lumen and periappendicular effusion. Laparoscopic appendectomy was performed. Persistent liver abscess due to appendicolith was a rare complication treated by percutaneous drainage. The appendicolith was successfully removed from the liver parenchyma by Dormia basket recovery system.

DISCUSSION: Treatment options include percutaneous, open, or laparoscopic drainage of the abscess and retrieval of the fecalith, as antibiotics and drainage alone are usually insufficient.

CONCLUSION: Only a handful of cases of hepatic abscess formation as a result of dropped appendicoliths have been reported in literature. Our proposal of treatment was the percutaneous approach. There was no need for a surgical procedure to remove the intrahepatic appendicolith.

KEY WORDS: Dormia basket, Intrahepatic abscess, Laparoscopic appendectomy, Percutaneous drainage

Introduction

In 2002, Navarra et al.¹ aimed to demonstrate the advantages of the laparoscopic approach for acute appendicitis in terms of complication reduction and diagnostic capability. Currently, laparoscopic appendectomy is the treatment of choice for acute appendicitis in emergency setting. When appendicitis is clinically suspected, an appendicolith can be found in 30% of the patients ².

Appendicoliths are formed by calcium salts and faecal debris layered and lodged within the appendix. They are detected on unenhanced x-rays in less than 10% of patients with appendicitis ³. An appendicolith may be retained post-operatively ('dropped appendicolith') due to previous perforation, non-recognition during surgery or the impossibility to remove it ².

The objective of this case report is to illustrate an intrahepatic localization of a dropped appendicolith causing liver abscess. This is an uncommon complication after laparoscopic appendectomy, treated by percutaneous drainage and Dormia basket recovery system to remove the intrahepatic appendicolith, in order to avoid a more invasive surgical procedure.

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Case Report

A 23-year-old female with no past medical history significant for diseases or interventions was admitted to the emergency department of our hospital following a 3-day history of abdominal pain and vomit. On admission, the physical examination revealed tachycardia, a blood pressure of 90/80 mmHg, pale and dehydrated skin. The patient had no fever. Laboratory findings revealed elevation of the white blood cell count (WBC) to 17000/mm³, and C-reactive protein (CRP) 0,59 mg/dl. Abdominal examination showed widespread pain and positive McBurney and Blumberg maneuvers. The patient underwent abdominal ultrasonography (US), which was not decisive for the diagnosis. A contrast-enhanced computed tomography (CT) revealed an acute appendicitis with coprolite obstructing the lumen and peri-appendicular effusion (Fig. 1).

The patient received amoxicillin/clavulanic acid as an antibiotic therapy and underwent emergency laparoscopic appendectomy with peritoneal lavage and drainage for diffuse purulent peritonitis. The appendix was sectioned through a single ligature at the appendiceal base and the appendicolith escaped into the right paracolic gutter. After careful laparoscopic abdominal exploration it was not recognizable and impossible to remove.

Post-operative course was characterized by a subfebrile state of the patient. In the 7th post-operative day (POD) there were fever and increased inflammatory indexes.

A chest X-Ray was negative and an abdominal US showed an intrahepatic abscess of the VI liver segment with a maximum diameter of 70 mm. Abdominal Magnetic Resonance Imaging (MRI) confirmed intrahepatic abscess (4x3,5x6 cm) with a 14 mm calcified image in the context (Fig. 2).

Therefore the patient received Tazocin 4,5 gr as an antibiotic therapy. In the 8^{th} POD, a percutaneous drainage of the intrahepatic abscess was performed and a 10 French (FR) drainage tube was positioned.

The procedure was performed in the interventional radiology suite. The microbiological examination of the purulent material was positive for E. Coli (Tazocin-sensitive). In the 17th POD blood tests were normal and the abscess resolved. Therefore, the percutaneus drainage was removed and, after two days without fever and normal blood tests, the antibiotic therapy was stopped.

The patient was discharged on the 19th POD. Three days after discharge (22th POD) the patient returned to our emergency room due to abdominal pain and nausea. Hemodynamically stable, TC 37°C. Laboratory data showed a white-blood cell count of 16230/mm3, serum hemoglobin concentration of 11.4 g/dl and CRP of 2.17 g/dl.

A CT-scan was performed, revealing an abscessualized collection (maximum diameter of 2.5 cm) with air bubbles, corpuscular fluid and an appendicolith in the parenchyma of the VI hepatic segment in the subglissonian site. CT scan also showed endoabdominal effusion with corpuscular features in the pelvic area. The patient was taken to the operating room. An explorative laparoscopy was performed, showing intra-abdominal blood effusion due to salpingitis and an adhesion bridle between the salpinge and the residual appendicular stump. A conversion from laparoscopy to mini-laparotomy was executed to make hemostatic control and an open peritoneal lavage and drainage. Liver exploration revealed a solid lesion inseparable from the parenchyma. The patient was discharged in the 6th POD for outpatient follow-ups, in good health state.

Forty-five days after appendectomy, the patient returned to our ER due to abdominal pain, fever and vomit for a week again. CT-scan revealed a persistent abscessualizated collection in the context of the VI-VII liver segment (60x42 cm), with perihepatic, right iliac fossa and right paracolic gutter effusion (Fig. 3).



Fig. 1: Computed Tomography (CT). Acute appendicitis with coprolite obstructing the lumen and periappendicular effusion.



Fig. 2: Magnetic Resonance Imaging (MRI). Intrahepatic abscess with a calcified image in the context (14mm).



Fig. 3: Computed Tomography (CT). Abscessualizated collection in VI-VII liver segment and perihepatic, right iliac fossa and right paracolic gutter effusion.



Fig. 4: X-Ray Imaging. Fluoroscopic controls of the abscess collection.

The patient underwent percutaneous drainage of the intrahepatic abscess and a 10FR drainage tube was positioned again. Microbiological examination of the purulent material was positive for E. Coli. An antibiotic therapy regimen, with Merrem 1 gr, was given to the patient three times per day. Blood cultures were negative. Six days after the drainage's placement, a first fluoroscopic control of the abscess collection was performed. The control showed reduced collection. The appendicolith was successfully removed with Dormia basket retrieval device in the interventional radiology suite (Fig. 4A). A second fluoroscopic control was performed 12 days after drainage's placement, showing a significant reduction of the abscess collection. For this reason, the drainage was closed and leaved in place and antibiotic therapy was suspended. A CT scan before to removal of the drainage showed the apex of the drainage tube at the site of the collections (hepatic segment VI-VII), greatly reduced in size.

A third fluoroscopic control was performed twenty-two days after drainage's placement. It showed the almost complete resolution of the abscess collection (Fig. 4B). Therefore, the drain tube was removed.

Discussion and Comment

As reported by Dincel et al. ⁴, obstruction in the lumen are the most important factors causing acute appendicitis. Fecalith and lymphoid hyperplasia are the most common factors causing intraluminal obstruction. The use of endoloop is usually our technique of choice for the appendix closure as well as several authors ⁵⁻⁸ reported in their series the use of endoloop for appendix stump closure instead other techniques. Retained or dropped appendicoliths are an uncommon complication that may occur as a consequence of stone expulsion from the appendix, before or during laparoscopic appendectomies, and typically manifest as a focal, subcentimeter area of high attenuation with or without an associated abscess close to the cecum or Morison's ⁹.

In theory, an appendicolith can lodge elsewhere in the abdominal cavity. Even a subcutaneous location has been described in the literature ¹⁰. Retained appendicoliths act as a nidus for infection and are likely to be the source of a postoperative intraperitoneal abscess and should be removed to prevent abscess development and possible overt sepsis. However, this is very rare with only 30 reported cases of intra-abdominal abscess secondary to an appendicolith in the literature over the past 40 years ³. Besides migration of an appendicolith in the free intraabdominal space, it can spontaneously migrate into the liver parenchyma and serve as a nidus for intrahepatic abscess formation². Treatment options include percutaneous, open, or laparoscopic drainage of the abscess and retrieval of the fecalith, as antibiotics and drainage alone are usually insufficient ¹¹. This complication could have been avoided if a systematic division of the appendix had been performed between double ligatures ¹². However, in our opinion a meticulous attention to the time of the appendicular section and an adequate coagulation of the stump may be sufficient to reduce the loss of intraluminal material and thus the postoperative complications rate following laparoscopic appendectomy.

A dropped appendicolith with abscess must be treated by open or laparoscopic surgery removing the appendicolith and draining of the abscess. Successful percutaneous removal of a dropped appendicolith and concomitant abscess drainage has been described in literature. In the setting of abscess drainage with retained appendicolith, abscess recurrence is inevitable ¹³.

O. Buckley et al. ¹⁴ published a retrospective study to evaluate the utility of CT guided percutaneous drainage of appendicolith related abscesses only in the short term. Formal surgical drainage and removal of the appendicolith is required for long-term success ¹⁴.

Conclusions

This paper highlights how essential it is to avoid the loss of a coprolith in the peritoneal cavity, with the aim of reducing the number of possible serious complications. Dropped appendicolith should always be considered as a possible complication after laparoscopic appendectomy and should be removed first at intraoperative time.

Besides migration of an appendicolith in the free intraabdominal space, it can spontaneously migrate into the liver parenchyma and serve as a nidus for intrahepatic abscess formation.

At non-recognition during surgery or the impossibility to remove it, as in our clinical case, abscess recurrence is inevitable.

Our choice of treatment was the percutaneous approach, which avoided another intervention and general anesthesia. The appendicolith was successfully removed from the liver parenchyma and there was no need for a surgical procedure.

Riassunto

L'articolo descrive una complicanza inattesa dopo intervento chirurgico di appendicectomia laparoscopica in urgenza. L'appendicectomia laparoscopica è, attualmente, il trattamento di scelta per l'appendicite acuta. Quando si sospetta clinicamente un'appendicite, si può riscontrare un'appendicolita nel 30% dei pazienti. Gli appendicoliti "ritenuti" o "caduti" sono una complicanza non comune che può verificarsi come conseguenza dell'espulsione del coprolita dall'appendice prima o durante l'appendicectomia, a seguito di perforazione, nonriconoscimento di esso o impossibilità ad essere rimosso. Questo evento è molto raro con solo 30 casi segnalati in letteratura di ascesso intra-addominale secondario a coprolita negli ultimi 40 anni. Oltre alla migrazione nello spazio libero intra-addominale, l'appendicolita può migrare spontaneamente nel parenchima epatico e servire da "nidus" per la formazione di ascessi intraepatici.

L'obiettivo di questo caso clinico è di illustrare una localizzazione intraepatica di un'appendicolita risultante come primum movens di un ascesso epatico.

La presentazione del caso riporta di una giovane donna di 23 anni ricoverata presso il Pronto Soccorso del Dipartimento di Emergenza e Accettazione del Policlinico Umberto I di Roma per un'appendicite acuta con coprolita ostruente il lume e versamento periappendicolare. È stata eseguita un'appendicectomia laparoscopica con lavaggio e drenaggio peritoneale per una peritonite purulenta diffusa. L'appendice è stata sezionata attraverso una singola legatura alla base appendicolare e il coprolita è migrato in doccia parietocolica destra. Dopo un'attenta esplorazione addominale laparoscopica non è stato possibile individuarlo e rimuoverlo.

La gestione postoperatoria è stata molto complessa, necessitando tra l'altro un reintervento chirurgico urgente per emoperitoneo. Tuttavia la permanenza del coprolita ha determinato un ascesso epatico persistente, localizzato al VI segmento parenchimatoso, presentandosi come una complicanza inaspettata, trattata infine con drenaggio percutaneo, in team multidisciplinare con l'equipe della radiologia interventistica. L'appendicolita è stato rimosso con successo dal parenchima epatico mediante un sistema di recupero "Dormia Basket".

Solamente pochi casi di ascesso epatico a seguito di appendicolita ritenuto sono stati riportati in letteratura, ma dovrebbe sempre essere considerato come possibile complicanza dopo un' appendicectomia laparoscopica e, soprattutto, dovrebbe essere rimosso in prima istanza durante il tempo operatorio. Qualora non sia possibile, la nostra proposta di trattamento alternativa, è la rimozione tramite approccio percutaneo, evitando così un' ulteriore e più invasiva procedura chirurgica.

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Commento e Commentary

PROF. NICOLA PICARDI Già Ordinario di Chirurgia Generale

Innanzitutto questa brutta e impegnativa esperienza dovrebbe servire da esempio per indurre ad apporre sempre due lacci o due clips alla base dell'appendice, che verrà poi sezionata tra di esse, come è la procedura corretta nell'appendicectomia "open", anche per evitare che liquame purulento scoli nel cavo peritoneale durante le manovre chirurgiche. In alternativa la clips distale destinata ad essere asportata con l'appendice potrebbe essere sostituita da un grasp che aiuterà ad introdurre il pezzo operatorio nel bag, eliminando ogni involontaria spremitura del lume appendicolare. La proposta di asportazione percutanea del coprolito espulso e ritenuto è proponibile solo nel caso della sua localizzazione in un punto preciso dell'addome, eventualmente con un focolaio ascessuale, se non è stato possibile rendersi conto nel corso dell'appendicectomia e dunque ignorandone l'esistenza prima dello sviluppo della complicanza

suppurativa correttamente riconosciuta nella sua patogenesi. Analoga possibile complicanza può svilupparsi per la perdita di calcoli biliari in caso di involontaria rottura della colecisti nel corso della colecistectomia, ma in tal caso manovre preventive e prevenzione della complicanza seguono altri percorsi.

First of all, this bad and demanding experience should serve as an example to induce to always affix two laces or two clips on the appendix' foot, which will then be sectioned between them, as is the correct procedure in performing a "open" appendectomy, also to prevent purulent sewage drains into the peritoneal cavity during surgical maneuvers. Alternatively, the distal clip intended to be removed with the appendix could be replaced by a grasp that will help introduce the appendix into the bag, eliminating any involuntary squeezing of the appendicular lumen.

The proposed percutaneous removal of the expelled and retained coprolith is only feasible in the case of its localization in a specific point of the abdomen, possibly with an abscess focus, if it was not possible to realize the bad event during the appendectomy and therefore ignoring its existence before the development of the correctly recognized suppurative complication in its pathogenesis.

A similar possible complication can develop for the loss of gallstones in the case of involuntary rupture of the gallbladder during cholecystectomy, but in this case preventive maneuvers and prevention of complication follow other paths.