

Case Report

Acute appendicitis caused by foreign body: report of two cases

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Abstract

Acute appendicitis caused by foreign body is an exceptional event. In a literature review over 100 year period of time, 256 cases were documented until the end of 1995. Thereafter, only few sporadic cases have been reported. We added additional two cases to the literature. Various objects acting as foreign bodies have been reported, including bird shot, bullets, fishing lines, screws, bone fragments, coins, toothbrush, pins, bristle, pins, keys and intrauterine devices. Interestingly, condom fragments were retrieved from the appendix of a patient. The latency time between the ingestion of the foreign body and the onset of symptoms could be measured in years.

Key words: Acute appendicitis; foreign body; perforation; probiotics; lead poisoning.

Introduction

The function of the appendix is thought to be equivalent to Bursa Fabricius in birds [1]. During the early years of development, the appendix has been shown to function as B lymphoid organs, assisting with the maturation of B lymphocytes. Researches have shown that appendix is involved in the production of molecules that help to direct the production of molecules leading to direct the movement of lymphocytes to various organs in the body. In addition, the appendix was found to supply the probiotics to the intestine when they are depleted due to diseases [2].

Appendix was thought to be the useless vestigial organ, and was often routinely removed and discarded during other abdominal surgery to prevent any possibility of later attack of acute appendicitis. Today, the appendix has been successfully used for reconstructive surgery in the field of urology [3, 4].

Worldwide appendectomy for acute appendicitis is the most common emergency surgical procedure [5]. The food particles, passing through gastrointestinal tract, can accidentally enter into the vermiform appendix. The particles found no way to come out of it. Thus, the stagnated material putrefied, and produced toxic substance, leading to severe inflammation. If the condition is ignored, the

inflamed tube may burst and releases harmful contents to the sensitive internal organs, and may even cause the death of the victim.

During my training year in the United States 50 years ago, negative appendectomy rate was used by tissue committee in the hospital as an indicator to monitor the performance of the surgeons. If the negative appendectomy rate was over that was set by the hospital, the surgeon's privilege would be suspended for a certain period of time.

In the process of reviewing the negative appendectomy rate at our hospital, we encountered two cases of acute appendicitis caused by foreign bodies. Here in we reported these two cases and share our experience.

Case report

Case 1

This 75 year-old man was admitted through the emergency room, because of the right lower abdominal pain one day prior to admission. In the emergency room, he complained of right lower abdominal pain without rebound tenderness. He denied of nausea and vomiting. His vital signs were normal. His body temperature was 36.7°C, with a normal leukocyte count. His biochemical studies including electrolytes were within the normal limits. However, his serum level of C-reactive protein (CRP) was 6 mg/dl (reference range: 0.1-0.3 mg/dl). He underwent the examination using computed tomography (CT) which revealed evidence of

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acute appendicitis. A radiopaque material was found within the appendix (Figure 1).

An open appendectomy was performed. The appendix has been perforated by a T shaped nail. The wall of the appendix was wrapped with fibrous tissue to form a mass (Figure 2). Microscopic examination revealed perforated acute appendicitis resulting in localized peritonitis.

Case 2

A 52-year-old man started periumbilical pain 10 days prior to admission. He sought help by a local practicing physician without relief. He came to our emergency department. On physical examination, his body temperature was 38°C, with a normal blood pressure and respiration rate. His white blood cell count was 12,000 /ul with left shift. His biochemical studies were unremarkable. The patient underwent a series of imaging studies. His abdominal computed tomography (CT) revealed a radiopaque spot in the appendix which was surrounded by dense fibrous tissue (Figure 3).

Diagnosis of ruptured acute appendicitis was rendered. He underwent an open appendectomy. The appendix was perforated by two long fish bone wrapped by fibrous tissue and formed a tumor mass [Figure 4]. On opening the mass, an abscess was found. Microscopic sections showed perforating acute appendix, resulting in an abscess with localized peritonitis [Figure 5, A&B].

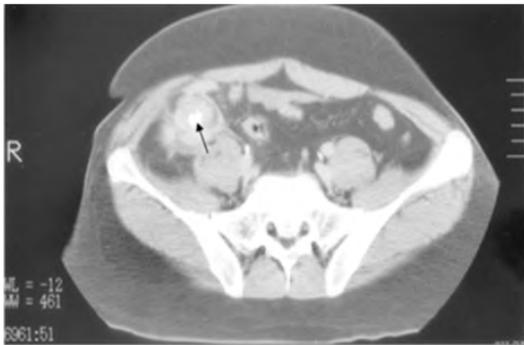


Figure 1: A radiopaque material was found within the appendix, arrow (Computed tomography).



Figure 2: A nail was retrieved from the appendix with abscess.

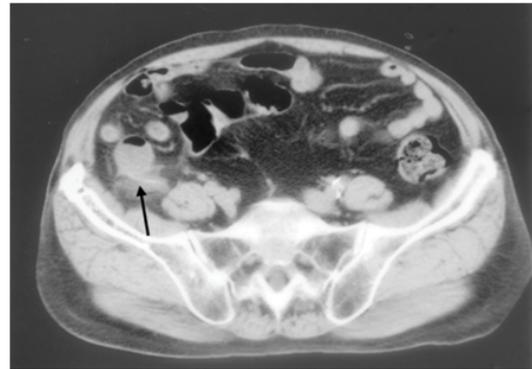


Figure 3: Abdominal computed tomography (CT) revealed an elongated radiopaque material (arrow) in the appendix which was surrounded by dense fibrous tissue.

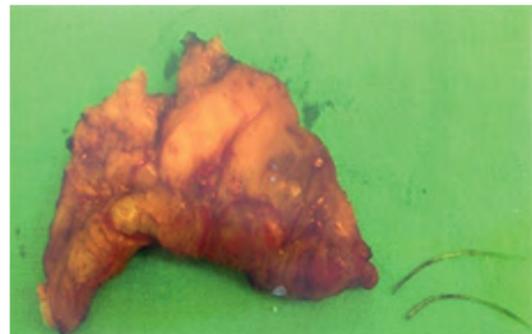


Figure 4: The appendix was perforated by two long fish bone wrapped by fibrous tissue and formed a tumor mass.

Discussion

At our hospital, the clinicians used to diagnose acute appendicitis based on Alvarado score. The negative appendectomy rate was around 15%. More recently, the clinicians have increasingly relied on radiologic imaging preoperatively, and decreased the negative appendectomy rate to 4.5% [6]. According to the statement of WSES Jerusalem guidelines for diagnosis and treatment of acute appendicitis [7], Alvarado score (with cut-off score <5) is sufficiently sensitive to rule out acute appendicitis. The Alvarado score is not sufficiently specific in diagnosing acute appendicitis.

The first reported appendectomy for acute appendicitis caused by foreign body was performed in 1736 on an 11-year-old boy at St. George's Hospital in London by Claudius Amyand during which a sewing pin was found to have perforated the appendix [8]. Acute appendicitis caused by foreign bodies is very rare. The prevalence is approximately 0.0005%. [9]. Most patients are children and mentally retarded adults, and the majority of these cases happen accidentally. In most instances, the ingestion of foreign bodies travels safely through the gastrointestinal tract, without causing symptoms, but bleeding, perforation, erosion and ulceration of the gastrointestinal tract can occur by sharp or

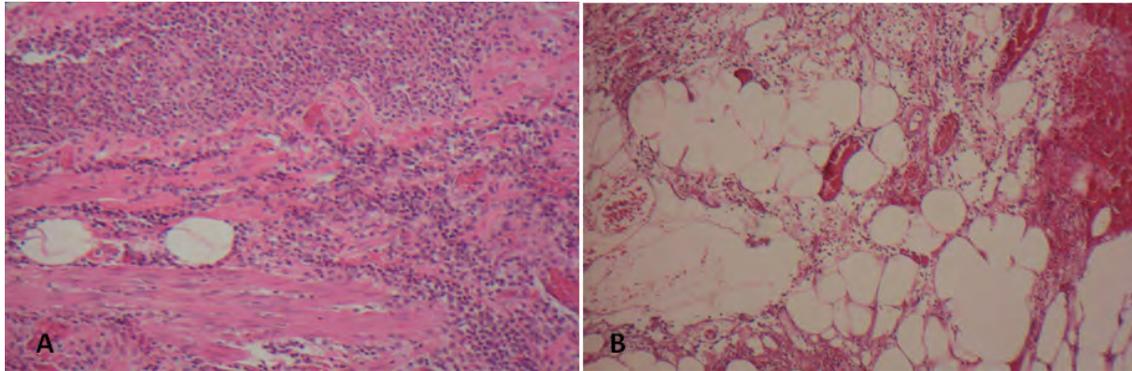


Figure 5: A) Microscopic examination revealed acute inflammation of the appendiceal wall with abscess (H & E stain, x200). B) At the vicinity of perforation, localized peritonitis was found (H & E stain, x200)

pointed foreign objects such as toothpick [10]. The complication rate of ingested foreign bodies is estimated to be less than 1 % [11]. In an article by Klingler et al, they did a 100-year review of the literature, and collected a total of 256 cases. Various objects acting as foreign bodies have been reported, including bird shot, bullets, fishing lines, screws, bone fragments, coins, toothbrush, pins, bristle, pins, keys and intrauterine devices [11]. A case report in the recent literature demonstrated an unusual foreign body, a condom, causing acute appendicitis [12]. Arya et al. [13] reported that multiple pieces of condom were retrieved from the bronchus of a 27-year-old woman. She inhaled the condom during oral sex. In the old days, women had the practice of holding needles and pins between their lips while sewing or pinning, accidental swallowing occurred occasionally. Those hunters eating wild game meat containing pellets was also a common reason of appendiceal foreign bodies [14-16]. Lodging of lead pellet or bullet shot in the body could cause lead poisoning [17]. A 39-year-old male was injured by shot gun 15 years prior to develop lead poisoning. He was successfully treated with chelating agent and removal of the fragmented bullets in his body.

If the weight of the foreign bodies is greater than the bowel fecal content, they arrest in the cecum during transit and gravitate toward its dependent portion [11]. The chance of entry to the lumen of the appendix depends on whether the orifice is tight or widely open. In case of a retrocecal appendix, there is almost no possibility for an object to enter the appendiceal lumen [10]. The foreign body may remain immobile in the appendix without stimulating as inflammatory process or cause an inflammatory reaction with or without perforation. The period of latency between ingestion of the foreign body and the onset of symptoms varies from hours to year's [18]. In some patients, formation of a fecal coat around the foreign body can control development of inflammatory process [19].

In our two cases, there were no histories of foreign body ingestion during clinical evaluation. In case 1 in our report, the patient was not mentally retarded, and could not remember

ingesting metallic object.

Depending on the size, the foreign body may pass the stomach the same velocity as the food the patient eat. Attempt should be made to retrieve them endoscopically within 24 hours [20]. If foreign body failed to be removed by endoscope, then surgery is indicated [21].

Conclusion

Acute appendicitis caused by foreign body is an exceptional event. Case reports over 100 year period of time until the end of 1995 was reviewed [11]. Thereafter, only few sporadic cases have been reported [9, 12, 14, 16, 18, 21-23]. We add two additional cases to the literature.

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