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Case Report

Abdominal and Brain Abscesses Secondary to Fish Bone: A Rare Case Report and Review of Literature

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Abstract

Foreign body ingestion is a common emergency in hospitals. Throat injury and gastrointestinal perforation are common complications, but brain abscesses caused by foreign bodies are very rare. Very few studies have been reported in the literature. A 73-year-old male with a history of more than 1-year of repeated dull pain in the right abdomen. He was treated with brain abscess incision and drainage in a local hospital because of a brain abscess two months earlier. In the small intestine, a high-density band with a diameter of approximately 40 mm was observed by Computed Tomography (CT). During surgery, a fish bone was found in the small intestine, 50cm away from the ileocecal valve, and there was pus and necrotic tissue around the fish bone. At 1- and 3-months follow-up, no abdominal pain or complications were noted.

Keywords: Brain abscess; Fish bone; Foreign body; Case report

Introduction

Foreign body ingestion is a common emergency in hospitals. Commonly ingested foreign bodies include fish bones, chicken bones, toothpicks, pig bones, etc., of which fish bones account for 84% of foreign body ingestion [1]. It often occurs in the elderly population, children, prisoners or individuals with mental disorders. Foreign body ingestion may cause symptoms such as abdominal pain, gastrointestinal bleeding, and intestinal obstruction. Bacteria can migrate through the blood circulation and cause liver abscesses, thyroid abscesses, mediastinal abscesses, and abdominal wall abscesses [2-4], but brain abscesses caused by foreign bodies are very rare. In this study, we present a case of abdominal and brain abscesses secondary to fish bone ingestion.

Case History

Primary Complaints

A 73-year-old man was admitted to our hospital because of repeated dull pain in his right abdomen for more than a year. The pain was paroxysmal and obvious when he changed position. There was no vomiting, dysphagia, fever, or diarrhea.

History of Past Illness

The patient was treated with brain abscess incision and drainage in local hospital because of a brain abscess two months earlier (Figure 1). He has a history of chronic hepatitis B for 1 year but did not receive antiviral treatment. He had hypertension for 1 year, the highest blood pressure measured was 160/90mmHg. He regularly took antihypertensive drugs and had no history of abdominal surgery.

Personal and Family History

The patient quit smoking 20 years ago but did not have a history of drinking and his family history was non-contributory.

Physical Examination

The patient's body temperature was 37.1°C, heart rate was 65 beats per minute with a normal rhythm, respiratory rate was 19 breaths per minute, blood pressure was 140/63 mmHg, and the oxygen saturation in room air was 98%. Heart sounds were normal but rales were heard in both lungs. The skin and mucous membranes of the entire body are normal in color, with a supple abdomen, tenderness in the right mid-abdomen, no rebound pain, and negative of shifting dullness. All other signs were negative.

Laboratory Examinations

The patient's blood tests showed that levels of white blood cells, hemoglobin, liver function, and blood coagulation factors were all within the normal range. An Electrocardiograph (ECG) was normal.

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Table 1: Summary of reports on brain abscess secondary to foreign body.

Author	Year	Age/Sex	Country	Foreign body	Location	Treatment	Symptom
Shah et al [13]	2020	10 ma/female	USA	Metal ornament hook	esophageal	Craniotomy+esophagoscopy	Fever, emesis
Sane et al [14]	1998	2yb/male	USA	Metallic needle	Lung	Craniotomy+endoscopy	Irritability, fever, severe retro-orbital pain
Sane et al [14]	1998	2y+3m/male	USA	Sunflower seeds	Right main bronchus	Craniotomy+endoscopy	Fever, leukocytosis, cough
Maramattom et al [15]	2012	52y/female	India	Fish bone	Upper esophagus	Endoscopy	Headache, throat foreign body sensation, neck pain and fever
Agarwal et al [16]	2003	2y/male	USA	Straight pin	Bronchus	Bronchoscopy	Irritability, intermittent emesis and weight loss
Louie et al [17]	2000	13m/male	USA	Coin	Esophagus	Endoscopy+ drain	Vomit and fever
Zhang et al [18]	2017	50y/female	China	Fish bone	Retropharyngeal	Decompressive craniotomy	Vomit and drowsiness

Imaging Examinations

CT examination showed that the small intestine in the lower right abdomen contained a high-density band, with a diameter of approximately 40 mm, the mesentery around it was blurred (Figure 2A/2B). In addition, multiple cysts were observed in the liver, as well as prostatic hyperplasia with calcification.

Initial Diagnosis

Bowel perforation, intra-abdominal infection, postoperation of brain abscess, liver cyst, benign prostatic hyperplasia, and hypertension.

Final Diagnosis

The fish bone pierced the small intestine, resulting in the development of an abscess in the abdominal cavity. Subsequently, bacteria entered the brain via the blood circulation, leading to a brain abscess.

Treatment

CT examination showed a high-density band in the small intestine. Considering the difficulty of endoscopic surgery, exploratory laparotomy was performed on the 3rd day after the patient was admitted to the hospital. During surgery, extensive and dense adhesions were observed between the intestinal tube in the abdominal cavity, omentum and the abdominal wall, like a silkworm cocoon, and many palpable hard nodules were observed in the small intestine. After careful separation of the adhesions, we found a fish bone in the small intestine 50cm from the ileocecal valve. The length of the fish bone was more than 3 cm, and about 20ml of pus had accumulated around the perforation. The fish bone was removed (Figure 3), pus was drained, and about 15cm of necrotic small intestine was removed.

Outcome and Follow-up

After surgery, the patient experienced intermittent vomiting and had diarrhea. Postoperative anti-infective treatment was administered (Imipenem and Cilastatin Sodium for Injection 1.0g every 8 hours) for 1week. The patient recovered and was discharged. At 1- and 3-months follow-up, no abdominal pain or complications were noted.

Discussion

Ingestion of foreign bodies is a common emergency in hospitals and often causes perforation of the digestive tract. Fish bones are the most common foreign bodies that cause gastrointestinal perforation [5]. After the foreign body enters the gastrointestinal tract, it often pierces the intestines at narrows or turns. The most common site of perforation is the terminal ileum, followed by the rectum and sigmoid colon [6]. Most patients visit a doctor within 24 hours after ingesting a foreign body, a few patients try to swallow vegetables, vinegar, or drink water to remove it [7], while others do not pay attention to it because there is no cough or pain. Delayed visits may lead to serious complications and increase mortality [8].

Early diagnosis and treatment of ingested foreign bodies are very important. CT plays an important role in diagnosing and locating foreign bodies, because of the high sensitivity and specificity of the technique [9]. Fish bones cause intestinal perforation on CT and usually appear as curved high-density shadows [10], thickening of the perforated intestinal wall, stranding of the surrounding mesenteric fat tissue and air bubbles is also important evidence for a perforation. In addition, CT can also give a comprehensive assessment of the complications that occur after fish bone ingestion, but some fish bones are radiolucent, so a negative X-ray or CT does not completely rule out the possibility of foreign bodies [11].

Most ingested foreign bodies smoothly pass through the gastrointestinal tract without any complications, but when the gastrointestinal tract is mechanically damaged, symptoms such as abdominal pain, gastrointestinal bleeding, and intestinal obstruction may occur. In some patients with clinical symptoms, foreign bodies can be removed through endoscopic techniques, and only a few cases require surgical intervention [5]. For patients with a perforation, digestive juice and intestinal contents accumulate in the abdominal cavity, and an abdominal abscess may form around the perforation site. When bacteria translocate through the blood circulation, serious complications can occur, such as liver abscesses, lung abscesses, and brain abscesses.

Brain abscesses are focal infections in the brain, most of which are caused by otitis media, mastoiditis, sinusitis, craniocerebral surgery or the entry of bacteria into the brain after trauma [12]. Brain abscesses caused by foreign body ingestion are rarely recorded in the literature: only 7 cases have been reported since 1998 (Table 1). Clinicians should carefully investigate the source of infection when diagnosing brain abscesses, such as skin and mucous membrane infections, tooth infections, etc. This patient was diagnosed with a brain abscess when he was hospitalized in the local hospital because he felt that abdominal pain was intermittent and the pain was not severe. When the doctor asked about the medical history, the patient did not complain of abdominal symptoms, so no source of infection of the brain abscess was found.

Looking back at the patient's entire diagnosis and treatment process, some problems are worth of our deep consideration.

We could have discovered the fish bones hidden in the patient's body earlier. When the patient was hospitalized for the first time because of a brain abscess, the clinician failed to carefully ask for the medical history and physical examination. Secondary brain abscesses caused by foreign body damage to the intestines is extremely rare, and there are few studies reported in the literature. Secondly, after the patient underwent surgical treatment of the brain abscess, there was no further screening for the cause of the brain abscess. After excluding other possible causes of the brain abscess, the patient should be arranged for related B-ultrasound and CT examinations to help facilitate the diagnosis. Failure to treat the root cause of the infection may lead to recurrence of the brain abscesses and other more serious complications.

Conclusion

Most patients accidentally ingest a foreign body. For patients who are suspected of ingesting a foreign body, it is very important to inquire and record the medical history. The most obvious part of abdominal tenderness may be the location of the foreign body, damage to the gastrointestinal tract, therefore, the role of physical examination in preliminary positioning cannot be ignored. A CT scan is the most helpful examination for diagnosing foreign bodies in the abdominal cavity. Three-dimensional reconstruction technology can help surgeons understand the general shape of a foreign body before surgery. Surgery is the most important method to treat foreign body ingestion. Early surgery can reduce the occurrence of serious complications and improve the patient's quality of life.

Author Statements

Conflict of Interest

The authors declare that they have no conflict of interest.

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