

# World Journal of *Clinical Cases*

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## Pyogenic liver abscess secondary to gastric perforation of an ingested toothpick: A case report

Yeshong Park, Ho-Seong Han, Yoo-Seok Yoon, Jai Young Cho, Boram Lee, MeeYoung Kang, Jinju Kim, Hae Won Lee

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### Abstract

#### BACKGROUND

Liver abscess due to foreign body-induced gastrointestinal tract perforation is a rare event that could be misdiagnosed due to low suspicion. Less than 100 cases have been reported to date.

#### CASE SUMMARY

We report a case of a 53-year old female patient with pyogenic liver abscess secondary to ingestion of a toothpick with penetration through the lesser curvature of the stomach. The patient presented with persistent epigastric pain. Abdominal computed tomography demonstrated the presence of a linear radiopaque object associated with abscess formation in the left liver lobe. Inflammatory changes in the lesser curvature of the stomach indicated gastric wall penetration by the object. As the abscess was refractory to antibiotic treatment, laparoscopic liver resection was performed to remove the foreign body and adjacent liver parenchyma. Following surgery, symptoms fully resolved without any sequelae.

#### CONCLUSION

This rare case demonstrates the importance of considering foreign body penetration as a cause of pyogenic liver abscess, particularly in abscesses of unknown origin that are resistant to antibiotic therapy. Clinical suspicion, early diagnosis, and prompt removal of the foreign body could lead to improved outcomes in these patients.

**Key Words:** Foreign body ingestion; Liver abscess; Pyogenic liver abscess; Liver resection; Case report

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**Core Tip:** Most ingested foreign bodies can be managed without intervention. In rare occasions, sharp objects might directly penetrate from the gastrointestinal tract into the liver. In such cases, early diagnosis and proper surgical management are necessary. We present a rare case of pyogenic liver abscess secondary to penetration of the stomach by an ingested toothpick. After administration of systemic antibiotics, laparoscopic removal of the foreign body was pursued. As the foreign body was not visible from the liver surface, left lateral sectionectomy was performed. Postoperative recovery was uneventful. In refractory liver abscesses, clinical suspicion for foreign body ingestion should be maintained.

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## INTRODUCTION

Foreign body ingestion is often encountered in clinical practice, particularly in the emergency department. Most foreign bodies either pass through the gastrointestinal (GI) tract uneventfully or can be successfully removed by endoscopy. Less than 1% of patients require surgical management due to severe complications including GI perforation or obstruction[1].

Depending on composition, foreign bodies may be difficult to detect on plain radiography or computed tomography (CT) scans due to their radiolucent nature. This may contribute to delays in diagnosis or definitive treatment. Rarely, recurrent events of intra-abdominal abscess, peritonitis, or even sepsis may later be attributed to foreign body ingestion and consequent GI complications[2]. Herein, we present a case of hepatic abscess secondary to toothpick-induced gastric perforation with direct penetration into adjacent liver tissue.

## CASE PRESENTATION

### Chief complaints

A 53-year-old female patient was admitted to our emergency department for evaluation of an intrahepatic foreign body.

### History of present illness

The patient had attended an outside hospital on the same day with a two-week history of persistent epigastric pain. Abdominal CT had revealed a needle-like structure in the left liver lobe. Esophagogastroduodenoscopy had demonstrated a fungating mass-like lesion with central depression on the anterior wall of the lesser curvature of the stomach without ulceration or perforation (Figure 1). At the time of evaluation at our center, she complained of persistent epigastric pain accompanied by vomiting. She denied any history of fever or chills.

### History of past illness

The patient denied any past illnesses.

### Personal and family history

The patient denied any personal or family history of related diseases.

### Physical examination

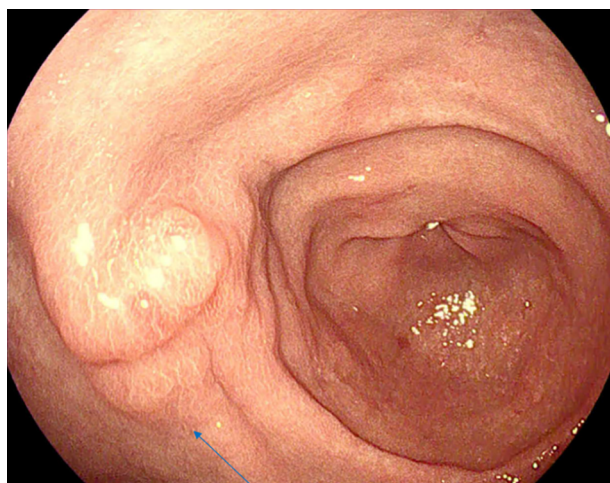
On arrival at the emergency department, her vital signs were stable with a blood pressure of 126/81 mmHg, pulse rate of 80 beats per minutes, respiratory rate of 18 breaths per minutes, and body temperature of 36.9 °C. Physical examination revealed no signs of peritonitis, with a soft, flat abdomen without any focal tenderness.

### Laboratory examinations

Laboratory studies demonstrated a white blood cell count of 13120/μL with 83.4% neutrophils, a hemoglobin level of 13.4 g/dL, and a serum C-reactive protein (CRP) concentration of 17.70 mg/dL. Mild increases in serum liver enzyme levels were observed with a serum aspartate transaminase level of 45 IU/L and serum alanine transaminase level of 46 IU/L. Blood cultures yielded no bacterial growth.

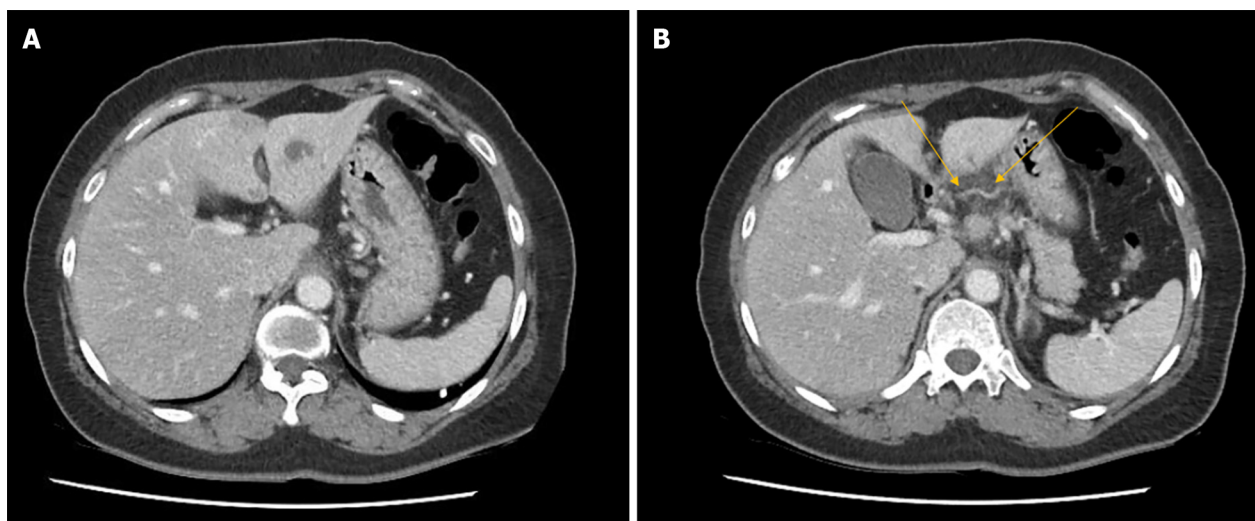
### Imaging examinations

Chest and abdominal plain radiography were unremarkable. CT images from the outside hospital were re-evaluated by our radiologists and demonstrated a thin linear radiopaque lesion with an adjacent low attenuating lesion in S3 of the liver (Figure 2). Mild infiltration was observed along the lesser curvature of the stomach adjacent to the S3 Lesion. Accordingly, foreign body penetration from the stomach to the liver was suspected. The patient was unable to recall the event of foreign body ingestion. She was admitted for conservative management including intravenous antibiotic therapy



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**Figure 1 Esophagogastroduodenoscopy result of the patient.** A fungating mass-like lesion with central depression on the anterior wall of the lesser curvature of the stomach was noted (blue arrow).



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**Figure 2 Abdominal computed tomography scan results of the patient.** A: Thin linear radiopaque lesion with adjacent low attenuating lesion in the S3 segment of liver; B: Mild infiltration at lesser curvature side of stomach antrum (orange arrows), suggesting foreign body penetration from stomach to liver.

(ceftriaxone 2 g/d and metronidazole 500 mg every 8 h) and analgesia. Follow-up CT was performed on the second day of admission. An interval increase in size of the adjacent complicated fluid collection was noted, indicating formation of a liver abscess.

## FINAL DIAGNOSIS

The patient was diagnosed with pyogenic liver abscess secondary to foreign body penetration from stomach to liver.

## TREATMENT

As the patient developed fever, antibiotic therapy was changed to ampicillin/sulbactam 3000 mg every 6 h. Due to the development of sepsis, a delayed operation was planned for removal of the foreign body. Fever persisted for four days, and the operation was performed one week after admission as the patients' body temperature was maintained in normal range. On laparoscopic inspection, the foreign body could not be identified from the liver surface on the suspected segment. Laparoscopic left lateral sectionectomy of the liver was therefore performed. Upon removal of the specimen, the foreign body was identified as a wooden toothpick (Figure 3). The patient was discharged on the fifth postoperative day





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**Figure 3** Toothpick surgically removed from the liver.

without complications. Treatment with an oral antibiotic (cefpodoxime 200 mg bid) was continued for a further week.

## OUTCOME AND FOLLOW-UP

Outpatient clinic follow-up confirmed the resolution of all symptoms and the return of serum CRP levels to within normal limits.

## DISCUSSION

Most ingested foreign bodies are excreted without injury to the GI tract, and foreign body-induced GI tract perforation is a rare event occurring in less than 1% of all cases[3]. Liver abscess formation due to foreign body-induced GI perforation is even rarer, with less than 100 cases reported to date[4,5]. As most patients fail to recall the event of foreign body ingestion, foreign bodies migrating to the liver often remain unnoticed until signs of systemic infection develop. Delayed diagnosis may increase the risk of morbidity and mortality, with foreign objects occasionally found only upon autopsy after patients have died from sepsis with an uncertain focus[6].

Although the type of foreign body ingested varies according to personal dietary habits, sociocultural features, and established psychiatric illnesses, fish bones and toothpicks are the most commonly discovered objects[7,8]. However, the identification of ingested radiolucent foreign bodies remains a radiologic challenge compared to metallic objects as they are not detectable by plain abdominal radiography[7,9]. Ultrasonography and CT are the preferred modalities in such cases and should always be considered when there is clinical suspicion of foreign body ingestion[10,11]. In the present case, the patient had ingested an entire wooden toothpick without any marks of mastication. Although the exact mechanism by which the toothpick entered the patients' GI tract was unclear, this involuntary ingestion may have been related to the Korean food culture of drinking soup. The toothpick may have been mixed in with soup ingredients and then accidentally swallowed.

The key aspects of treatment for hepatic abscesses caused by foreign body-induced GI perforation is early diagnosis and prompt removal of the foreign body[2,10]. Simple percutaneous drainage of the abscess may transiently alleviate symptoms; however, recurrent episodes of sepsis might follow and surgical removal of the foreign body is likely to be required in the end[12]. The removal of foreign bodies from the liver can be performed by endoscopic procedures, laparoscopic surgery, or open surgery[13]. In cases where the foreign body is in transit between the GI tract and the liver, the foreign body may be visible and therefore removed by endoscopy[14]. When penetration into liver tissue is suspected, surgical removal accompanied by abscess drainage may be necessary[2]. Intra-operative ultrasonography may have utility in identifying the location of intra-parenchymal foreign bodies[14]. For objects located deep in the liver parenchyma, resection of the affected liver segment has been reported using both laparoscopic and open approaches according to the general condition of the patient[5,10].

## CONCLUSION

We report a case of successful treatment of a hepatic abscess caused by foreign body-induced GI perforation with laparoscopic liver resection. Hepatic abscesses caused by migration of an ingested toothpick are extremely rare, with less than 20 cases officially reported. Diagnosis is often delayed due to patients being unable to recall foreign body ingestion and

low awareness of this rare condition among clinicians. The present case emphasizes the importance of considering ingested foreign bodies in the differential diagnosis of cases of pyogenic liver abscess, particularly in previously healthy individuals presenting with left-sided abscesses refractory to aspiration and antibiotic therapy.

## FOOTNOTES

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