CASE REPORT

Gastric Penetration by an Ingested Toothpick Successfully Managed with Computed Tomography and Endoscopy

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Abstract

A 31-year-old woman who had ingested a toothpick consulted our hospital because of epigastralgia. An abdominal computed tomography (CT) demonstrated a toothpick penetrating the gastric wall. Endoscopic examination demonstrated an ingested toothpick protruding from the prepyloric antrum. The whole toothpick was removed using a basket catheter without complications. CT images were useful to acquire clinical information such as location of the toothpick end. Unintentional ingestion of toothpicks must be considered potentially dangerous. The locations of both ends of the toothpick should be confirmed by CT or ultrasonography; and then, the toothpick should be removed as soon as possible.

Key words: gastrointestinal tract, foreign body, basket catheter, abdominal imaging

(Introduction: 10.2169/internalmedicine.46.0037)

Introduction

Most ingested foreign bodies that reach the stomach pass safely through the intestinal tract. If the objects are long, hard and sharp, like pins or toothpicks, the risk of perforation of the gastrointestinal wall is higher (1). A gastric perforation can cause acute symptoms with signs of peritonitis and can sometimes lead to death. Herein, we describe a case of gastric penetration due to the ingestion of a toothpick that diagnosed by computed tomography (CT) and successfully treated with an endoscopic technique.

Case Report

The patient was a 32-year-old woman, 157 cm tall and weighing 50 kg. She consulted our hospital for epigastralgia and fever. She experienced dull continuous abdominal pain for one day with no specific aggravating or relieving factors. She reported having accidentally swallowed a toothpick on the previous day. The patient had been in good health and there was no contributory past medical, or drug history. She denied any history of excessive alcohol consumption. Her body temperature was 37.6°C, blood pressure was 142/70 mmHg, and radial pulse rate was 70 beats/min and regular. She had neither anemia nor jaundice. Laboratory tests showed a red blood cell count of 446 × 10^4/μl, a white blood cell count of 9,800/μl (normal range; 4,000-9,000/μl), and a platelet count of 18.2 × 10^4/μl. Hemoglobin concentration was 13.2 g/dl. Liver function tests demonstrated: aspartate aminotransferase 20 IU/l, alanine aminotransferase 17 IU/l, alkaline phosphatase 190 IU/l, γ-glutamyltranspeptidase 17 IU/l, lactate dehydrogenase 164 IU/l and total bilirubin 0.68 mg/dl. Test for C reactive protein demonstrated 0.1 mg/dl. In renal function tests, blood urea nitrogen was 10.6 mg/dl, and creatinine 0.8 mg/dl. Plain abdominal X-ray did not show any abnormal findings including free air (Fig. 1). However, an abdominal plain CT scan revealed a toothpick penetrating gastric posterior wall (Fig. 2A, B). The gastric posterior wall in the antrum was thicker than anterior wall (Fig. 2A). The ends of the toothpick were far from the liver and major vessels. The ends of the toothpick were also far from the lesser omentum (Fig. 2B). There was no evidence of inflammation in the gastric mesenteric fat and greater omentum. No major vessel injury was seen on CT findings (Fig. 2A, B). Endoscopic examination of the stomach revealed an ingested toothpick protruding from the prepyloric antrum (Fig. 3A). The toothpick was deeply fixed into the antral wall. The whole toothpick (2.0 cm long) was removed using a basket catheter without damage to the gastrointestinal wall, bleeding or other complications (Figs. 3B, 3C). The toothpick had been transfixied in the stomach wall for a...
Figure 1. A plain abdominal X-ray on arrival did not show any abnormal findings.

Figure 2. Abdominal computed tomography (CT) images. Horizontal view (A) and sagittal view (B) demonstrated a low-density foreign object penetrating the gastric wall (white arrows). The gastric posterior wall in the antrum was thicker than the anterior wall (A). There was no evidence of severe inflammation or major vessel injury in the abdomen (A, B).

Figure 3. Endoscopic management of the ingested toothpick. Endoscopic examination revealed an ingested toothpick protruding from the prepyloric antrum (A). The whole toothpick was removed using a basket catheter (B). The removed toothpick was a length of 2.0 cm (C). Clip placement was performed at the toothpick removal site (D).
length of about 1.6 cm. Clip placement was performed at the removal site (Fig. 3D). After endoscopic removal of the toothpick, her epigastralgia resolved. She was admitted to our hospital and treated with a daily dose of proton pump inhibitor (omeprazole 20 mg) and antibiotics for 2 days. Her low-grade fever continued for 2 days’ duration. On the third hospital day, the patient was asymptomatic. Therapy with omeprazole and antibiotics was stopped and she was discharged on the third hospital day. She has been under periodic observation without drugs, and has been free of symptoms for 3 months after discharge.

**Discussion**

Ingested foreign bodies more frequently lodge in the esophagus. Once in the stomach, they usually pass through the intestinal tract without difficulty. Toothpicks, however, by nature are more likely to cause intestinal perforations than other objects because they are long and pointed. About 80-90% of ingested toothpicks pass through the gut without discovery (2). The incidence of “toothpick-related injuries” to the intestinal organs is estimated at 0.2/100,000 population (3). However, some cases of toothpick ingestion may lead to gastrointestinal bleeding, bowel perforation, obstruction (4), sepsis (2) or other diseases (5,6). Indication for surgical treatment are as follows: 1) bowel perforation, 2) peritonitis due to perforation, 3) migration to other organs close to the perforating site, 4) bleeding or severe inflammation in the abdominal cavity, 5) penetration to the vessels, and 6) abscess formation, etc. Endoscopic examination is contraindicated when free air due to perforation is confirmed by abdominal X-ray or CT.

Perforation or penetration due to the foreign body can be asymptomatic, causing later complications in adjacent organs (7). Peristalsis of the intestinal tract will propel the toothpick through the intestinal wall, which can lead to migration to other organs close to the perforating site, thereby demonstrating a very different clinical course such as constrictive pericarditis (8) or liver abscess (5). Thus, swallowed toothpicks should be removed as soon as possible. Fortunately, the toothpick swallowed by the present patient was smoothly removed because she remembered ingestion and consulted our hospital the next day. The reasons why the present patient had a favorable result might be as follows: 1) the whole ingested toothpick could be removed promptly, 2) there was no evidence of severe inflammation in the abdomen, and 3) the ends of toothpick were far from the liver or major vessels.

When ingestion of a foreign body is suspected, we should attempt to determine what the patient swallowed. If the object is long and sharp, it must be removed immediately because the risk of perforation of the gastrointestinal wall is higher. If the object is an alkali battery, gastrointestinal damage may occur due to chemical toxicity. However, there are patients who do not remember ingestion or even using a toothpick (9,10). Thus, foreign body ingestion should be considered during the evaluation of abdominal pain of recent onset. Physicians should also be aware that it is difficult to point out a toothpick in the gastrointestinal wall by plain abdominal X-ray because of its X-ray lucency. In the present case, an abdominal CT scan was performed before endoscopic examination and a toothpick, which had penetrated the gastric wall, appeared as a low-density foreign body. Kanazawa et al (5) reported a patient that had ingested a toothpick one month before liver abscess appeared as a high-density spot on CT. It was not clear why the toothpick of their case appeared as a high-density spot, and they did not mention the reason in the report. We speculate that the ingested toothpick appeared as a low-density object on CT at the onset; however, the CT finding may change because of decay in the body as time goes on. CT images are useful to acquire clinical information regarding: 1) the depth of penetration, 2) location of both ends of the toothpick, 3) bleeding and 4) inflammation in the abdomen (1,5,9,11). Rioux and Langis reported the usefulness of ultrasonography (US) in the detection of the ingested toothpick (1). In the present case, US was not performed because we could confirm the location of the toothpick by CT images. If endoscopic removal is performed before CT or US in a patient with toothpick ingestion, dangerous signs such as penetration to the vessels may be overlooked. Recently, Obinata et al (12) reported a case of toothpick ingestion that led to gastrointestinal artery rupture after endoscopic removal. Thus, in cases of unintentional ingestion of sharp foreign bodies, it is necessary to determine the depth of penetration and location of both ends of foreign body by CT or US before endoscopic removal.

In conclusion, we reported a case of gastric penetration due to the ingestion of a toothpick that was diagnosed by CT and managed by endoscopy. Despite the favorable clinical course of our case, toothpicks must be considered potentially dangerous, just as other pointed objects.

**References**

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