

Conservative Management of Duodenal Perforation with Toothpick in a 9- Year Old Girl; a Case Report

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Abstract

Background

Foreign body ingestion is a relatively common in children. Most ingested foreign bodies spontaneously pass out of the body via the gastrointestinal (GI) system but sharp materials may perforate the GI tract and need to surgical intervention.

Case Presentation

The patient was a 9-year-old girl with progressive abdominal pain for one month and admitted with acute abdomen impression. She underwent esogastroduodenoscopy (EGD) due to severe epigastric tenderness. Upper GI endoscopy revealed duodenal ulceration and perforation by a toothpick while she had no history of foreign body ingestion. Toothpick was removed by endoscopy. She was successfully managed conservatively and had no abdominal pain during the one month follow-up period.

Conclusion

We recommend the endoscopic approach as the preferable method for the extraction of duodenal foreign bodies in children, even in the case of intestinal perforation.

Key Words: Duodenal perforation, Foreign body, Gastrointestinal, Pediatrics.

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1- INTRODUCTION

The ingestion of a foreign body is one of the most frequent childhood accidents requiring urgent care depending on the type and localization (1). The majority of foreign bodies pass harmlessly through the gastrointestinal tract;(2) however, a small proportion (<1%), can cause significant complications such as aspiration and sudden death, perforation, abscess formation and esophagoaortic fistula which needed surgical intervention(3). Only 10% to 20% of foreign bodies require interventions such as endoscopy for removing, and most of them leave the GI tract uneventfully (4).

2- CASE PRESENTATION

A 9-year-old girl was referred to a pediatrician with abdominal pain in the epigastric region in June 2016. He checked *Helicobacter pylori* (*H.pylori*) testing and treated with amoxicillin, metronidazole and omeprazole due to positive anti-*H.pylori* serology. She had poor response to treatment and was referred to pediatric gastroenterologist. On examination, she was alert with mildly epigastric tenderness. Her vital signs were PR=88/min, RR=27/min, BP=100/65 mmHg, T=36.9°C and weight=31kg. According to the previous antibiotics using ranitidine was administered for the patient temporarily

and designed for doing endoscopy two weeks later. Next week the patient was referred to pediatric surgery with severe abdominal pain and likely acute abdomen. The surgeon requested pediatric gastroenterology consultation due to the normal abdominal ultrasound and CT scan. On examination, she was toxic with severely epigastric tenderness. Her vital signs were PR=108/min, RR=34/min, BP=110/74 mmHg, T=37.6°C and weight=30kg. She had no oral tolerance, therefore with likelihood of peptic ulcer disease or pancreatitis, was transferred to the pediatric gastroenterology service for doing endoscopic examination. Laboratory data showed leukocytosis (WBC=21500/mm³) with PMN dominancy (75%), ESR=105/1sthr, CRP=74, and Lipase = 34 u/l. Liver function tests and widal test were normal. Broad spectrum antibiotics (ceftriaxone, metronidazole and gentamicin) were administered for patient and candidate for upper endoscopy. In upper endoscopy esophagus and stomach were normal, but bile reflux was seen. A clean base ulcer 1.5 to 0.8 cm was seen on anterior wall of the duodenum with hitting out a sharp object (like bone) with a length about 14 millimeters (**Figure-1**). Foreign body was removed, but it was a toothpick about 7 cm (**Figure-2**). However, the patient and her family did not take any history of foreign body ingestion.



Fig.1: Duodenal ulcer and perforation with toothpick



Fig.2: Toothpick brought out from duodenum

To prevent the entrance of duodenal secretion into the peritoneal cavity by air inflation with endoscope, the readmission of duodenum was quitted for seeing the toothpick extraction site.

A new history of the patient revealed the accidental swallowing of a toothpick stuck in a gummy candy about one month ago. She didn't have any significant symptoms while swallowing therefore she ignored it.

The patient kept NPO with fixation of nasogastric tube (NGT) and continued antibiotics with daily monitoring. The next day, she had about 500^{cc} bile secretion in gastric bag within 24 hours, which is replaced with half equivalent of normal saline.

On examination she was well and mild epigastric tenderness was reduced than before endoscopy. Ultrasound with a focus on the duodenum on 48hr after Esophagogastroduodenoscopy (EGD), revealed a small collection with dimensions of 11 x 6 mm inferior medial to the second part of duodenum and three hypoechoic lymph nodes in the vicinity to superior of the duodenum. Four days after endoscopy abdominal tenderness was little

and patients WBC counts had fallen to 7500/mm³ with 53% polymorphonuclear leukocytes, but her ESR was increased to 110 mm/1st hr (**Table-1**). Ceftriaxone was changed to meropenem. Pediatrics surgical consultation was requested. The surgeon was ordered abdominal CT scan with oral contrast for detection of likely duodenal perforation and/or abscess.

Abdominal CT scan was performed on the third day after endoscopy and was normal. Abdominal tenderness disappeared on fourth days after endoscopy and ESR reduced to 75/1st hr. A Nasogastric tube (NGT) was removed and the patient began to eating and well tolerated. Duodenal ultrasonography was repeated five days after endoscopy and was normal.

Antibiotics were continued and the patient laboratories were repeated every three days. On the tenth day after endoscopy leukocyte count of patients decreased to 8600/mm³ with PMN=36%, CRP=9 and ESR=37mm/1st hr and patient discharged with good condition and oral Lansoprazole (30mg). One month later, she was well with normal CBC, ESR and CRP.

Table-1: Laboratory parameters

Variable	Admission	3rd day	4 th day	8 th day	11 th day	15 th day	Reference value
WBC, $\times 10^9/L$	21.5	13.1	9.9	7.5	7	8.6	4-10
PMN, %	75	74	62	53	33	36	40-60
RBC, $\times 10^6/mm^3$	4	3.8	3.9	3.92	3.8	4.12	4.2-5.4
Hb, g/dl	11	10.4	10.5	10.6	10.6	12	12-16
Hct, %	34	33	33.2	32.4	33	37.5	36-46
MCV, fL	85	86.84	85.13	82.65	86.84	90.5	77-97
MCH, Pgm	27.5	27.37	26.92	27	27.89	29.13	26-32
Plat, $\times 10^9/L$	430	427	371	531	542	523	140-440
ESR, mm/1 st hr	105	100	97	110	50	37	2-20
CRP	74	72	71	39	16	9	<10

3- DISCUSSION

We present a 9-year-old girl with abdominal pain for one month before admission. Upper endoscopy revealed duodenal ulceration and perforation with a long (about 7 cm) toothpick with no history of foreign body ingestion. She had forgotten the ingestion and after expelling the toothpick in a new history she confessed the swallowing of a toothpick which was dipped in a gummy candy about a month ago. The ingestion of a foreign body is a common, but potentially serious condition in children. Up to 90% of foreign bodies in children pass through the gastrointestinal (GI) tract unaided and without complications after reaching the stomach (5). Exceptions are the long, large and sharp foreign bodies that cannot cross the pylorus, duodenum or ileocaecal junction (6) and lead to gastrointestinal perforation sometimes (7). Thus those that are long, sharp, pointed or large in size need removal to avoid serious complications (8).

According to the literature 10% to 20% of foreign bodies require endoscopic removal, whereas only 1% of them will finally need surgical intervention (9). Determining the indications and timing for intervention requires assessment of clinical

symptoms, patient and object size, type of ingested object, location, time since ingestion, and some other factors. The best modality for foreign body removal was controversial over the years but recently endoscopic removal under direct vision with airway protection is recommended to prevent complications (10). The most common sites of intestinal perforations by foreign bodies are the ileocecal and rectosigmoid regions, but duodenal perforation is relatively uncommon (11).

Most of duodenal perforations by foreign bodies have been reported in adult patients and all of them have been managed surgically (12). Our patient is the first case of duodenal perforation with foreign body that has been managed by endoscopic removal and conservative treatment.

We believe that the secret of our success was the first-hand and straight removal of object with suction of air and fluid while going backward. Then we inserted NGT for emptying GI tract secretions and kept the patient NPO with parenteral nutrition. It prevented the excess entrance of air and duodenal secretion into the peritoneal cavity. Broad spectrum antibiotics controlled the created paraduodenal small abscess.

4- CONCLUSION

Endoscopic and conservative management of duodenal perforation and small abscess formation due to sharp subjects was preferred.

5- ABBREVIATION

- PR: Pulse rate,
- RR: Respiratory rate,
- BP: Blood Pressure,
- T: Temperature,
- WBC: With blood cell,
- PMN: Polymorphoneuclear,
- ESR: Erythrocyte sedimentation rate,
- CRP: C-reactive protein,
- RBC: Red blood cell,
- Hb: Hemoglobin,
- Hct: Hematocrit,
- MCV: Mean corpuscular volume,
- MCH: Mean corpuscular hemoglobin.

6- CONFLICT OF INTEREST: None.

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