Duodenocolic fistula due to safety pin ingestion

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The authors describe the case of a 16-month-old boy with benign duodenocolic fistula due to safety pin ingestion who presented with abdominal pain, diarrhea and weight loss. Etiology, symptomatology, diagnosis and management are discussed and the literature is reviewed. Early diagnosis and surgical management are necessary to avoid serious morbidity.

Key words: benign duodenocolic fistula, safety pin ingestion.

Foreign body ingestion is a relatively common condition in children. Most ingested foreign bodies pass harmlessly through the gastrointestinal tract in children, many probably unknown to parents. However, open safety pins especially usually lodge at one of three locations in the gastrointestinal tract: the esophagus, the duodenum or the cecum[1]. Benign duodenocolic fistula (DCF), defined as a fistula between the duodenum and colon, is an unusual complication of numerous nonmalignant gastrointestinal diseases[2]. In the present case the cause of the DCF was penetration of the duodenum by the swallowed safety pin. Review of the literature revealed only three previously reported cases of DCF secondary to foreign body ingestion, but we did not find any case of DCF due to safety pin ingestion in childhood. To our knowledge this is the first such case in childhood.

Case Report

A 16-month-old was admitted to Farabi Medical School Pediatric Surgery Department with diarrhea, weight loss and intermittent abdominal pain for the previous one month. On physical examination the abdomen was soft and nontender and the bowel sounds were increased. He was moderately dehydrated. His body temperature was 38°C and there was a history of fever for the last four days. Rectal digital examination demonstrated a watery yellow-green stool. Laboratory findings included a white blood count of 13,200/mm^3, hemoglobin level of 9.2 g/dl, and albumin value of 2.8 g/dl. No pathogens were isolated from the feces.

Plain and lateral abdominal X-rays showed a downward oriented (distally) safety pin probably located at the junction of the second and third portions of the duodenum without free air (Fig. 1). To consider the possibility of retroperitoneal perforation of the duodenum, an

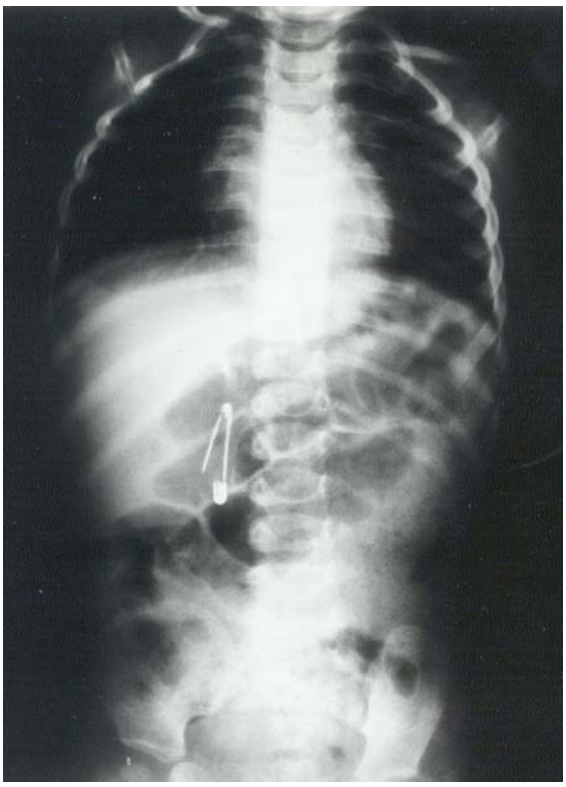

Fig. 1. A lateral abdominal X-ray showing distallly oriented safety pin probbaly located at the junction of the secnod and third portions of the duodenum.

abdominal ultrasonography and computed tomography were performed. No retroperitoneal free air or collection was seen. Gastroduodenoscopy revealed that the tip of the safety pin was penetrating the duodenum and was fixed. At laparotomy the proximal transverse colon was firmly adherent to the duodenum. On mobilization, a fistulous tract was found joining the anterior wall at the junction of the second and third portions of the duodenum to the proximal transverse colon just distal to hepatic flexure. The diameter of the fistula was 0.2 cm. The tract was excised, and the duodenum and the colon were repaired.

Discussion

Benign DCF is a rare complication of a number of gastrointestinal diseases and it is seldom considered in diagnosis[4]. The first case of DCF was decribed in 1863 by Sanderson[2,5]. Benn et al.[2] reviewed the world literature and discovered 125 cases of benign DCF. Causes were duodenal ulcer, Crohn's disease, duodenal diverticulum, tuberculosis, ulcerative colitis, appendicitis and foreign body penetration. The most common were perforated duodenal ulcer and Crohn's disease[2,3]. The frequency of causal factors in reported cases is listed in Table I.

Table I. Etiology and frequencey of DCF in Earlier Published Cases

Etiology	No of cases
Duodenal ulcer[2]	30
Crohn's disease[2]	29
Duodenal diverticulum[2]	15
Tuberculosis[2]	15
Iatrogenic[2]	5
Ulcerative colitis[2]	4
Diverticulosis coli[2]	4
Appendicitis[2]	3
Foreign body penetration[2]	3
Trauma[8]	2
Amebiasis[2]	1
Pseudotumor (hydatid cyst)[2]	1
Idiopathic/spontaneous[2]	15
Typhoid[8]	1
Total	128

DCF: duodenocolic fistula.

Most of the previously described cases have been characterized by weight loss and most by diarrhea, as in our case. Two theories for this have been proposed: passage of the duodenal contents into the colon with bypass of the small bowel; or, the higher intraluminal pressure within the colon causes intermittent retrograde fecal flow into the duodenum, thereby contaminating the proximal gastrointestinal tract, particularly the jejunum[3,5,6]. As a result, diarrhea, malabsorption, hypoproteinemia, and sometimes anemia are common signs and symptoms[3,7]. Our patient had watery stools 3-5 times a day and a 2-kg weight loss in the last month. Additionally, anemia and hypoalbuminemia were noted. Pain commonly occurs in the epigastrium or in the right hypochondrium and may be colicy in character[2,3,8]. Our patient also had intermittent abdominal pain.

Rosenquist and Sjöberg[9] considered that fistulas involving the junction of the second and third parts of the duodenum without pathological evidence of underlying disease might be due to the slow erosion of the duodenal wall by a swallowed foreign body lodged at the bend.

We suggest that a slow enlargement of perforation allowed time for the omentum and colon to cover the anterior wall of the duodenum, and this prevented peritonitis and free air.

The diagnosis is usually established by radiologic studies; barium enema is generally believed to be most reliable, with a sensitivity of 85%-95%[2,3,8]. Gastroduodenoscopy and colonoscopy are also used for diagnosis[2]. Treatment consists of excision of the fistula and repair of the duodenal and colonic defects. Closure of the fistula provides prompt relief[2-5].

Although foreign body ingestion is a relatively common condition in children, it is occasionally complicated by a DCF.

We conclude that a diagnosis of DCF must be considered if abdominal pain, diarrhea or weight loss is associated with persistently located foreign body at the duodenum.

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