



Science

## **FISH BONE PERFORATION OF SMALL BOWEL MIMICKING ACUTE APPENDICITIS**

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### **ABSTRACT**

*Accidental ingestion of foreign bodies is a commonly encountered event in clinical practice. However, small bowel perforation due to a fish bone is a rare phenomenon. Often, the exact diagnosis is missed preoperatively and is revealed only at laparotomy. Delay in diagnosis and treatment can be associated with significant morbidity and mortality. We report a case of 54-year male who presented with right lower quadrant pain with nausea and vomiting. Clinically, Acute appendicitis was diagnosed. Computerized tomography (CT) of the abdomen confirmed pockets of free air in the right lower quadrant with fat streaking suggestive of perforated ileum. On exploratory laparotomy, the ileal perforation was confirmed secondary to a fish bone. Although rare, foreign body perforation of the small bowel should be entertained in the differential diagnosis in certain groups of patients presenting with acute abdomen.*

#### **Keywords:**

*Small bowel perforation, fish bone or foreign body perforation of small bowel.*

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### **1. INTRODUCTION**

Ingestion of a sharp foreign body (fish bone) is mostly accidental. Most of the swallowed foreign bodies are expelled out of the body in stool without causing any problem. Perforation due to fish bone ingestion can occur at any site along the gastro-intestinal (GI) tract [1]. In only 1% of patients, the foreign body perforates the distal ileum [2]. Preoperative diagnosis of fish bone induced perforation of small bowel is rarely made because the clinical presentation is non-specific and it can mimic a number of surgical conditions like appendicitis and diverticulitis. An

erect chest X-ray may show free gas under the diaphragm and abdominal X-ray often shows no specific findings as non-metallic objects are rarely visualised. Computerized tomography (CT) scan may identify the foreign body and its associated complications - micro-perforation, fistulisation or obstruction. Early intervention should be taken to prevent further morbidity and mortality.

## 2. THE CASE

A 63 year old diabetic male presented to the emergency department with 3-day history of right iliac fossa pain which worsened over the last 6 hours. The patient also had nausea, vomiting but no fever or diarrhoea. On examination, he was ill looking, with pink, moist mucous membranes. He had a pulse of 102/min but normotensive. He was markedly obese with a BMI of 40. There was guarding and rebound tenderness over the Mc Burney's point; the bowel sounds were hypoactive. Rectal examination was normal.

The white blood count was  $19 \times 10^3 / \mu\text{L}$  (reference: 4.0-11) and Hb was 13.8 g / dL.

Erect Chest X-ray revealed no free air under right diaphragm. Plain abdominal radiography showed localized ileus in the right lower quadrant.

Computerized tomography scan revealed a pocket of free air in right lower quadrant (fig. 1). The terminal ileum was moderately distended and there also was mild fat streaking. Of note a linear foreign body was noted to be penetrating out of the small bowel (fig. 2). The appendix was normal.

A clinical diagnosis of ruptured appendix was suspected. The patient was resuscitated and started on broad spectrum antibiotic.

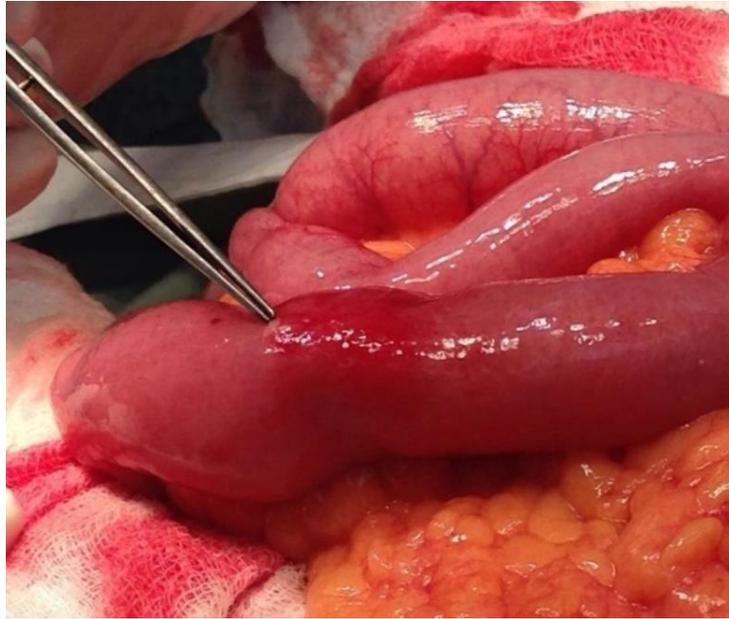
The patient was carried for emergency exploratory laparotomy. The abdomen was opened by midline incision. The localized collection of pus in right lower quadrant was sucked out. The terminal ileum was distended, edematous, and adjacent to a fish bone perforation 20 cm from the ileo-caecal valve (fig. 3). The foreign body was removed and it was noted to be a fish bone (fig. 4). The margins of the perforation were excised and primary closure was performed. The patient recovered well and was discharged on the 5th postoperative day. On interrogation the patient acknowledged that he incidentally swallowed a piece of fish bone 4days ago. At 6 months follow up our patient has no recurring abdominal symptoms and presently doing well.



**Figure 1:** CT scan of abdomen and pelvis showing pockets of free air in right iliac fossa



**Figure 2:** CT scan of abdomen and pelvis showing the presence of a hyper dense lesion within the lumen of the distended ileum



**Figure 3:** Intraoperative photo showing the perforation of the terminal ileum



**Figure 4:** Picture of the fish bone (after removal from the lumen of the ileum)

### 3. DISCUSSION

Foreign body (FB) ingestion is a common problem worldwide with an estimated incidence of 120 per million populations and it accounts almost 1500 deaths each year [3].

FB ingestion is seen in both adults and children. Toddlers are the most frequently affected [4]. Although rare in conscious and stable adults, it is fairly a common problem in psychiatric patients [3, 5, 6]. In normal adults foreign body ingestion is mostly accidental. The exact

aetiology in these groups is not well understood. Certain risk factors increase the chances of swallowing foreign bodies; these include advanced age, rushed, overeating, rapid eating habits as in our case, or a voracious appetite, defective tactile sensation of the palate, previous gastric surgery enhancing the passage of foreign bodies or causing stenosis and adhesions, achlorhydria where the foreign body passes unaltered from the stomach, and diverticula predisposing to impaction [3, 6, 7].

Intentional foreign body ingestion is commonly reported in certain adult populations. Velitchkov et al in his series of 542 patients from 1973 to 1993 from Bulgaria noted that 70% of the patients were jail inmates and more than 20% of them had psychiatric conditions [8].

The literature has documented different forms of ingested foreign bodies. Some of them are sharp and some blunt.

Among these, sharp objects i.e- fish bones [9, 10, 11], chicken bones [12, 13, 14, 15]. metallic rods and needles [12, 16], tooth picks [17], pins and needles remain the most common cause of gastro intestinal perforation [2]. Very rarely pens, metal wires, small trocar [18], spoon handle, nail clippers, nails, laundry pegs, dental prosthesis [19, 20, 21], batteries [22], injurious foreign agent [23], wireless capsule endoscopy [24, 25, 26], migrating biliary sent, gossybiopioma [27], schistosomia japonicum [28], unusual FB [29] may also cause gastro intestinal perforations. Several authors have documented that fish bone remains the most common cause of GI perforation [3, 6, 30]. However Pinero Madrona et al documented that chicken bone remains the most common cause of GI perforation in their population.

The most common location of GI perforation is in the angulated areas i.e-ileo-caecal valve or the recto-sigmoid junction; however, it can occur in any part of small bowel. The distal ileum remains the most common location (38.6%) of GI perforation [6, 31]. Occasionally foreign body perforation occurs in the duodeno-jejunal flexure, colonic flexures, hernial sac, appendix, Meckel's or colonic diverticulum and anal sphincter [32, 33]. In cases of sigmoid perforation, diverticulitis or unsuspected colon carcinoma have been reported as a secondary findings [15, 34]. Colorectal or colovesical fistulas have also been reported as being caused by ingested foreign bodies [19, 35]. In our case the perforation occurred approximately 20 cm proximal to the ileo-caecal valve.

In infants, foreign bodies 2 or 3 cm in length may become impacted in the duodenum, however in adults; objects longer than 5 cm can pass through the 'C' loop of the duodenum into the jejunum [12].

The clinical presentation is varied from un-seen passage per rectum to severe peritonitis following bowel perforation or acute bowel obstruction. Perforation of the stomach, duodenum or colon tends to have a delayed presentation compared to perforation of the small bowel [36]. Abdominal pain is the most frequently presenting symptom and is usually associated with nausea, vomiting, fever or diarrhoea. Different findings include localized abdominal abscess, inflammatory mass or omental pseudo-tumor, chronic or acute intestinal obstruction, enterovesical, colovesical or colorectal fistula, bleeding, renal or ureteral colic and endocarditis [3, 37, 38].

Foreign body perforation of small bowel presenting as right iliac fossa pain mimicking as an acute appendicitis is very rare. Perforations of the stomach and duodenum by needles can be silent [16]. The most common diagnosis of RIF pain in both male and female is acute appendicitis.

Several investigations can be used for determining foreign body perforation or obstruction in the gastrointestinal tract and each has its distinct advantages. Abdominal X-ray can demonstrate the metallic foreign body, localized ileus or bowel obstruction but may fail to detect nonmetallic objects like ours [39]. Abdominal ultrasound examination can be helpful in detecting any free fluid, localized abscess or any gynecological pathology but it is operator dependent and of limited value in obese patients. The non-radio opaque objects can be detected on USS, because of their background shadowing and high reflection rates [31]. Our patient was very obese hence USS of the abdomen and pelvis was not performed. The computerized tomography (CT) scan of abdomen remains the imaging modality of choice. It can demonstrate the non-metallic foreign body (fish bones), any perforation, fat streaking, localized abscess, intestinal obstruction or other pathology [31, 32, 34]. Multi detector CT offers the best possibility of reapplication with high resolution. It is currently accepted as the first line investigation in patients with acute abdomen and in determination of foreign bodies [37].

In some cases imaging findings can be nonspecific; however, the finding of a foreign body with extra-luminal pockets of free air or an associated mass in patients with clinical signs of peritonitis, mechanical bowel obstruction, or pneumo-peritoneum strongly suggests the diagnosis of foreign body perforation [12, 40]. Finally, endoscopic examination, especially in the upper gastrointestinal tract, can be useful in diagnosis and management of ingested foreign bodies. In our case abdominal CT with contrast agent revealed the perforation caused by the ingested fish bone with a linear lesion with hyper density surrounded by inflamed tissues.

The management of this patient depends on presentation. As perforation generally leads to an acute abdomen, the treatment of choice is surgery. However, the patient with localized tenderness without any temperature spikes or tachycardia and CT evidence of localized abscess, micro-perforation, fistula or ileus can often be managed conservatively with broad spectrum antibiotics along with percutaneous drainage, laparoscopic washout and drainage [9].

At laparotomy, if the perforation site is sealed off and not identifiable, simple suction of the abscess, wash out with placement of a drain is sufficient [9].

However, once the perforation site is identified, the exact nature of the surgery (i.e either excision of the margins with primary repair [11] or segmental resection and anastomosis [10] depends on the size of the perforation, degree of contamination, underlying condition of the bowel and judgement of the surgeon.

Although there are case reports of successful repair of the perforation with the primary repair like ours, most authors recommend segmental resection and anastomosis [11,10].

#### **4. CONCLUSION**

Although rare, foreign body perforation of the small bowel should be entertained in the differential diagnosis in all patients presenting with acute abdomen. History taking should include accidental ingestion of any foreign body in the past in order to consider this diagnosis. Emphasis should be given to early diagnosis and treatment to prevent minimise and mortality

#### **5. LEARNING POINTS**

- Fish bone perforation of small bowel is a rare occurrence.
- The diagnosis of fish bone perforation of the ileum can often be missed.
- However, it should be entertained in all high risk patients presenting with right lower quadrant pain
- A contrast CT scan should be obtained to pinpoint the diagnosis in these patients.
- Aggressive resuscitation and prompt treatment should be done to prevent further morbidity and mortality.

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#### **7. CONFLICTS OF INTEREST**

The authors have declared no conflicts of interest

#### **8. AUTHOR'S DECLARATION**

The authors have nothing to disclose

#### **9. PATIENT'S CONSENT**

Patient consent was obtained for publication of this article

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