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**OLGU SUNUMU/CASE REPORT**

# Intestinal perforation due to ingestion of fish bone

## Balık kılçığına bağlı intestinal perforasyon

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**Abstract**

Perforation of the gastrointestinal tract by accidently ingested foreign bodies is rare, occurring in less than 1% of the patients. Fish bones are the most common foreign bodies leading gastrointestinal tract perforation due to their elongated shape end sharp ends. Preoperative diagnosis of the gastrointestinal tract perforation by foreign body is challenging since the patients present with a wide and nonspecific spectrum of symptoms and usually don't recall ingestion of the foreign body. It should always be kept in mind in cases with acute abdominal complaint. Herein, we present multidetector computed tomography findings of a case with bowel perforation due to fish bone. Thus, computed tomography scan revealed the foreign body with perforated intestinal segment, led prompt diagnosis and optimal surgical treatment even in a patient with no preoperative history of foreign body ingestion.

**Key words:** Fish bone, imaging, multidetector computed tomography, perforation

**Öz**

Gastrointestinal sistemin yabancı cisim yutmaya bağlı gelişen perforasyonu %1 den az görülen nadir bir durumdur. Balık kılçığı, uzun ve keskin uçlu olması nedeniyle gastrointestinal system perforasyonuna en sık yol açan yabancı cisimdir. Yabancı cisim yutmaya bağlı gelişen perforasyon, belirtilerinin nonspesifik ve geniş bir spektrumda olması ve hastaların genellikle yabancı cisim yuttuğunu hatırlamaması nedeniyle operasyon öncesinde koyulması zor bir tanıdır. Ancak akut abdominal bulgularla baş vuran hastalarda her zaman akılda tutulmalıdır. Bu olgu sunumunda, balık kılçığına bağlı intestinal perforasyon olgusunun çok kesitli blgisayarlı tomografi bulguları sunulacaktır. Çok kesitli blgisayarlı tomografi sayesinde, yabancı cisim yutma öyküsü bulunmayan hastada operasyon öncesinde yabancı cisme bağlı intestinal perforasyon tanısı koyulmuş ve derhal uygun cerrahi tedavi yapılmıştır.

**Anahtar kelimeler**: Balık kılçığı, çok kesitli bilgisayarlı tomografi, görüntüleme, perforasyon

## INTRODUCTION

Perforation of the gastrointestinal (GI) tract by accidently ingested foreign bodies is rare condition, detected in less than 1% of the patients[1]. The most common foreign bodies leading GI tract perforation are fish bones due to their elongated shape end sharp ends[2]. The patients present with a wide and nonspecific spectrum of symptoms such as abdominal pain, fever, localized peritonitis, nausea, vomiting, hematochezia and melena[3]. Bowel perforation by foreign body can also mimic other conditions causing surgical abdominal diseases, such as perforated peptic ulcer, diverticulitis or acute appendicitis[4]. In addition to its nonspecific clinical presentation, the inability to obtain a history of foreign body ingestion makes preoperative diagnosis complicated[2]. We report a case of bowel perforation due to fish bone and diagnosed preoperatively with multidetector computed tomography (MDCT) scan.

## CASE

A 76-year-old female patient with no previous abdominal complaints, presented to the emergency room of our hospital with a 2-day history of increasing generalized abdominal pain. On physical examination, she had generalized abdominal

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tenderness. Her body temperature was normal (36ºC) and the laboratory data other than mildly elevated white cell count (12.6 x $10^9$/l) were within normal limits. An immediate non-contrast enhanced abdominal MDCT scan was requested by the clinician. MDCT scan disclosed focal intestinal wall thickening and mesenteric fatty infiltration around it. Coranal and axial images showed a thin linear hyperdens structure penetrating the wall of swollen intestinal segment and suspected to be a foreign body (Figure 1). Exploratory laparotomy was performed. 10 cm of swollen jejunal segment with erythematous change, inflammation and perforated regions was detected and resected (Figure 2). The foreign body was a sharp and thick bone of a fish head which the patient ate two days ago. She had an uneventful postoperative recovery and was discharged six days after the surgery.

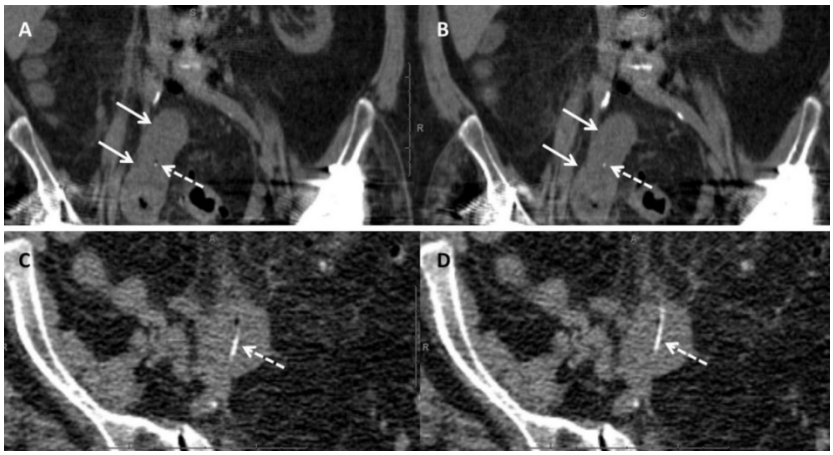


**Figure 1. Coronal reformatted image of abdominal MDCT scan showed focal intestinal wall thickening (arrows) and mesenteric fatty infiltration around it. Coranal and axial images showed a linear radiopaque structure penetrating the bowel wall and suspected to be a foreign body (dashed arrows).**

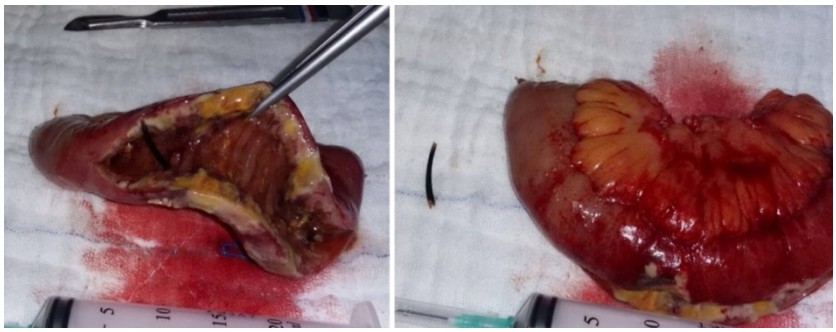

**Figure 2. Photograph of the gross specimen shows swollen jejunal segment with erythematous change, inflammation, perforated regions and a sharp fragment of ingested fish bone penetrating the bowel wall.**

## DISCUSSION

Fish bone ingestion is more common in eastern countries and in some populations that people prefer to eat all parts of the fish[5]. Psychiatric patients, prison inmates, alcoholics, drug abusers and children are others in the risk group[6]. However, the only significant risk factor proven by the present analysis is the wearing of dentures for it eliminates the tactile sensation of the palatal surface[7]. In our case the patient was wearing denture as well.

Preoperative diagnosis of the GI tract perforation by foreign body is challenging since patients do not recall ingestion of the foreign body and the diagnosis is not confirmed until after the surgery as in this case. The areas of acute angulation, immobile

and rigid nature or narrow lumen such as terminal ileum, duodenal C-loop and rectosigmoid junctions are more common sites of perforation[6]. Perforation of jejunum as in our case is rare with an incidence of 14.3%[2].

Non-metallic foreign bodies, such as fish bones and other bone fragments, pose a unique diagnostic callange. Fish bones have variable radio-opacity which depends on the fish species[8]. They are generally minimally radiopaque and difficult to define on radiographs[8]. Furthermore even if they are sufficiently radio-opaque, they can be obscured by large soft tissue masses, free fluid or air, particularly in obese patients[2]. A prospective study revealed that the sensitivity of radiography for detecting fish bone is 32%[9]. Another difficulty with radiography is on detection of free gas due to perforation by foreign bodies[10]. Since impaction of the fish bone through the intestinal wall causes progressive erosion covered by fibrin, omentum and adjacent loops of bowel, the passage of large amounts of air into the peritoneal cavity is limited[6]. Consequently, radiographs are not reliable in the diagnosis[10].

Ultrasonography (US) as a radiation-free investigative tool has several advantages over computed tomography (CT) in preoperative detection of foreign bodies. Even non-radiopaque foreign bodies such as fish bones can be identified by their high reflectivity and variable posterior shadowing[11]. US has high flexibility, repeatability, low price and allows a more clinical approach that combines real-time imaging with palpation and helps the clinician to focus their attention on the symptomatic area of the abdomen[12]. Intra-abdominal free fluid and adjacent tissue changes can also be seen using US[3]. However, it may be challenging to evaluate deeper areas of the abdomen depending on the patient's morphological characteristics, the location of the perforation, and the performance of the operator[12].

CT scan has been helpful in accurate detection of foreign body perforation. Fish bone appears as a linear calcified lesion on CT scans as in our case. It is surrounded by an area of inflammation. Perforation can be recognized on CT scans as localized pneumoperitoneum around a thickened intestinal segment, regional fatty infiltration, or associated intestinal obstruction[2]. The main limitation of CT in the diagnosis of intestinal perforation secondary to ingestion of fish bone is its observer dependence[7]. Fish bone can be missed due to lack of observer awareness or mistaken for a blood vessel on intravenous contrast-enhanced CT[9]. Goh et al. suggested to repeat unenhanced CT the diagnosis is strongly suspected[2]. Although intravenous contrast agents are used routinely during a CT scan of the abdomen in the emergency department of our hospital, MDCT of this case was obtained without contrast medium because she had a history of chronic renal failure. This helped us distinguish the hyperdens foreign body passing through the lumen of the intestine.

Positive oral contrast media and scanning thickness may also obscure the foreign body in the lumen of GI tract[2]. MDCT, in which only water is used to distend the GI tract and thinner CT slices can overcome these problems[2]. Furthermore, MDCT allows multiplanar reconstructions which would be useful in orientation and trace structures such as blood vessels to differentiate from an extraluminal foreign body[13]. In our case 16-MDCT with neutral contrast medium and 2 mm slice thickness was used and coronal reconstruction of the images facilitated the diagnosis.

Preoperative diagnosis of the GI tract perforation by foreign body is challenging since the patients present with a wide and nonspecific spectrum of symptoms and usually don't recall ingestion of the foreign body. It should always be kept in mind in cases with acute abdominal complaint. In our case, MDCT scan revealed the foreign body with perforated intestinal segment, led prompt diagnosis and optimal surgical treatment even in a patient with no preoperative history of foreign body ingestion.

## REFERENCES


1. Sheng-Der Hsu, De-Chuan Chan, Yao-Chi Liu. Small-bowel perforation caused by fish bone. World J Gastroenterol. 2005;11:1884-5.
2. Goh BK, Tan YM, Lin SE, Chow PK, Cheah FK, Ooi LL et al. CT in the preoperative diagnosis of fish bone perforation of the gastrointestinal tract. AJR Am J Roentgenol. 2006;187:710-4.
3. Emir S, Özkan Z, Altınsoy BH, Yazar FM, Sözen S, Bali İ. Ingested bone fragment in the bowel: Two cases and a review of the literature. World J Clin Cases. 2013;1:212-6.
4. Joglekar S, Rajput I, Kamat S, Downey S. Sigmoid perforation caused by an ingested chicken bone presenting as right iliac fossa pain mimicking appendicitis: a case report. J Med Case Rep. 2009;3:7385.
5. Eisen GM, Baron TH, Dominitz JA, Faigel DO,

Goldstein JL, Johanson JF et al. Guideline for the management of ingested foreign bodies. American Society for Gastrointestinal Endoscopy. Gastrointest Endosc. 2002;55:802-6.
6. Madrona AP, Hernández JAF, Prats MC, Riquelme JR, Parrila Paricio P. Intestinal perforation by foreign bodies. Eur J Surg. 2000;166:307-9.
7. Goh BK, Chow PK, Quah HM, Ong HS, Eu KW, Ooi LL et al. Perforation of the gastrointestinal tract secondary to ingestion of foreign bodies. World J Surg. 2006;30:372-7.
8. Ell SR, Sprigg A. The radio-opacity of fish bone species variation. Clin Radiol. 1991;44:104-7.
9. Ngan JH, Fok PJ, Lai EC, Branicki FJ, Wong J. A prospective study on fish bone ingestion. Experience of 358 patients. Ann Surg. 1990;211:459-62.
10. Coulier B, Tancredi MH, Ramboux A. Spiral CT and multidetector-row CT diagnosis of perforation of the small intestine caused by ingested foreign bodies. Eur Radiol. 2004;14:1918-25.
11. Coulier B. Diagnostic ultrasonography of perforating foreign bodies of the digestive tract. J Belge Radiol. 1997;80:1-5.
12. Nylund K, Odegaard S, Hausken T, Folvik G, Lied GA, Viola I, et al. Sonography of the small intestine. World J Gastroenterol. 2009;15:1319-30.
13. Mutlu A, Uysal E, Ulusoy L, Duran C, Selamoğlu D. A fish bone causing ileal perforation in the terminal ileum. Ulus Travma Acil Cerrahi Derg. 2012;18:89-91.