

# Imaging Findings of Fish Bone Complicating as Intraabdominal Abscess with Review of Literature

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**Abstract**—Ingestion of Gastrointestinal (GI) foreign bodies represent a challenging scenario since the patient usually do not remember unintentional ingestion of foreign body. Accidentally ingested foreign body for the most part pass through the GI tract [1,2]. Fish bones are one of the most commonly ingested foreign objects. If complications occur due to the impaction/perforation owing to their sharp pointed edges and secondary complications thereof – they are rarely diagnosed preoperatively as the clinical symptoms are non-specific and may mimic more commoner acute abdominal conditions like appendicitis or diverticulitis . Increased morbidity as a result of delayed diagnosis is a challenge to be overcome[5] and early diagnosis with appropriate clinical history and radiological investigations has to be made for timely treatment.

We describe a rare case of a 45 year old male patient with foreign body (FB) i.e fish bone ingestion presenting with nonspecific abdominal pain for a week duration. Abdominal ultrasound and Computed tomography(CT) scan showed an ill-defined intraperitoneal mass in the mid abdomen with a foreign body measuring 46mm in length suspicious for fish bone. On laparotomy an intraabdominal abscess containing a fish bone was resected.

**Index Terms**— CT , Ultrasound ,Fish bone, Intraabdominal abscess.

## I. INTRODUCTION

Accidental unintentional foreign body ingestion is common in clinical practice with most ingested foreign bodies passing out through the GI tract within 1 week[6]. If complications occur, then perforation of the GI tract is the most frequent complication[7,8,9] occurring in <1% with Ileum, sigmoid colon and rectum being most commonly involved[1,2].

Patients with perforation present as acute emergency and those presenting late as intraabdominal abscess/ foreign body granulation formation . Late presenters are usually unaware of the foreign body ingestion rendering preoperative diagnosis a real challenging process.

A definite preoperative diagnosis can be made based on clinical history, gastro endoscopy, colonoscopy, CT and surgical exploration . However CT is considered the method of choice for preoperative diagnosis and their complications because of multiplanar capability and high resolution[10-14]. Fish bones are usually not visible on plain radiograph films, thus CT being imaging modality of choice for preoperative

diagnosis of foreign body , more specifically fish bone ingestion and their intraabdominal complications.

Here we report a case of large bowel perforation, involving transverse colon caused by a long fish bone complicating as intraabdominal abscess which was diagnosed preoperatively with CT and treated surgically. 45 year old otherwise healthy patient presented to our hospital with complaints of dull aching abdominal pain since 1 month with bouts of vomiting. History of fever for one month was elicited for which patient had consumed fishes as means of domestic remedy. No recollection of fish bone ingestion was made by the patient. On clinical examination tenderness was elicited in the mid abdominal region. Patient vitals - pulse rate, blood pressure were within normal limits. Laboratory investigations revealed high total leukocyte count of 15,000 cells. Platelets, liver function parameters, serum amylase and lipase levels were within normal limits. Later patient was subjected to contrast CT abdomen , where the diagnosis of intraabdominal abscess with linear hyperdense foreign body , most probably fish bone was done. Retrospectively Ultrasound abdomen was done to locate the abscess with fish bone and for guided aspiration of pus.

## II. REVIEW OF LITERATURE

Foreign bodies usually pass through the gastrointestinal tract without problems once beyond the esophagus[1,2]. Most ingested foreign bodies pass through the gastrointestinal (GI) tract uneventfully within 1 week [6]. Perforation occurs in about 1% of all foreign bodies ingested usually due to long and sharp object such as fish bones, toothpicks, chicken bones and needles [1,2].

Terminal ileum, sigmoid colon, and rectum are the most frequent perforation sites [4]. Foreign body perforations of the GI tract have diverse clinical manifestations and the correct preoperative diagnosis have been seldom made.

The first case of hepatic abscess as a result of a gastrointestinal perforation caused by a foreign body was published by Lambert in 1898[15].

The incidence of foreign bodies requiring operative removal varies greatly in the literature. Figures ranging from 1% to 14% have been reported [3]. Increased morbidity and mortality are the price for the delayed diagnosis of complications and subsequent timely treatment [5].

Computed tomography (CT), especially multidetector CT (MDCT), is considered the method of choice for preoperative diagnoses of ingested foreign bodies and their complications due to its high-quality multiplanar capabilities and high resolution [10-14]. CT in the detection of intraabdominal fish bones was 71.4% for initial reports but improved to 100% on

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retrospective review of CT scans [12].

### III. IMAGING FINDINGS

Patient was submitted to a plain abdominal radiograph to rule out hollow viscus perforation. No evidence of free air under diaphragm, abnormal air fluid levels/dilated bowel loops was seen. No abnormal radiopaque densities seen.

Abdominal ultrasound revealed an ill-defined heterogeneously hypo echoic mass lesion in the mid abdomen (left paraumbilical region) with a linear hyper echoic foreign body like structure within. Adjacent bowel loops showed inflammatory changes. No free fluid in abdomen. Guided aspiration of the mass revealed abscess.

Abdominal contrast enhanced CT revealed an ill-defined heterogeneously enhancing hypodense intraperitoneal mass lesion measuring 8.2x6.2x6.6cm in the mid abdomen at paraumbilical region. The lesion showed multiple non enhancing necrotic areas within suggestive of abscess. A linear hyper dense structure measuring approximately 4.6 cm in length was seen within the lesion. Adjacent transverse colon showed wall thickening measuring 12mm in thickness. No pneumoperitoneum or ascites was seen. Diagnosis of a foreign body, probably fish bone complicating as intrabdominal inflammatory abscess was made.

Laparotomy confirmed a fish bone penetrating the transverse colonic wall and complicating as an ill-defined intraabdominal abscess, adjacent to the transverse colon. The fish bone was removed and primary repair of the perforation site was performed. Post-operative course was uneventful.



Fig 1: Ultrasound scan of abdomen showing a heterogeneously hypoechoic mass with a linear hyperechoic structure within suspicious of a foreign body.

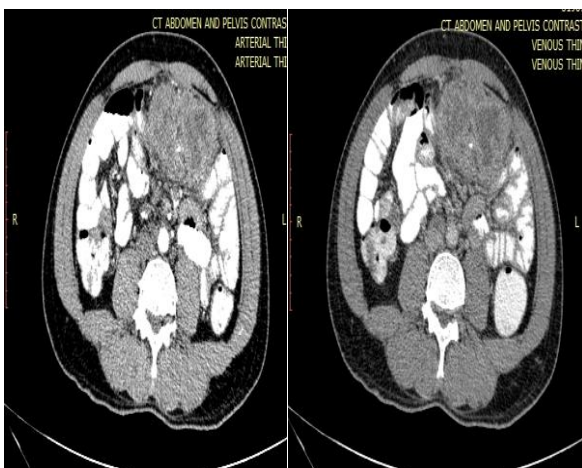


Fig 2(a)



Fig 2(b)

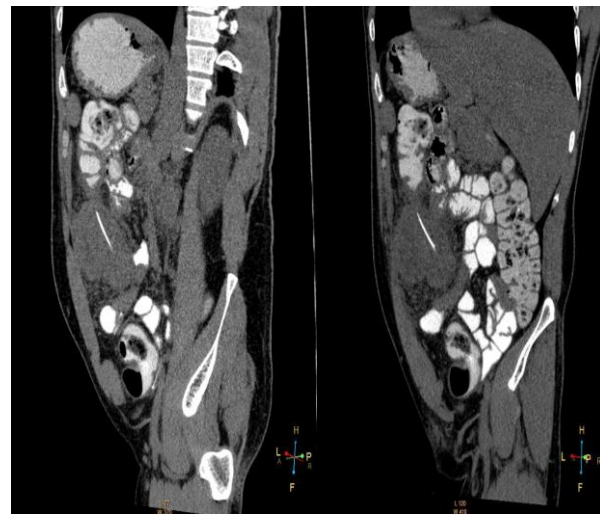


Fig 2(c)

Fig 2: Axial (2a),coronal(2b- arterial phase and bone window) and sagittal oblique (2c) reformatted CECT abdomen revealed an ill defined inflammatory mass lesion with necrotic areas and a linear hyperdense structure within suggestive of a foreign body most probably FISH BONE abutting the transverse colon.

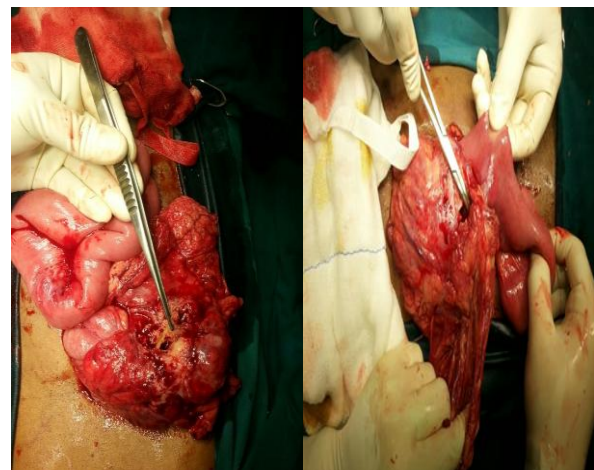


Fig 3: Inflammatory mass containing fish bone(held by the forceps) with the site of perforation in the transverse colon(artery forceps).

### IV. DISCUSSION

Perforation can occur in any segment of the gastrointestinal tract, with distal ileum[16] being the most common site for

perforation followed by, ileocecal junction, left colon and at rectosigmoid junction due to their greater angulations. Ingestion of foreign bodies is mainly found in individuals with psychiatric disorders such as bipolar disorder, depression, or post-traumatic stress disorder. Alcoholism, psychiatric illness, age extremes and the use of dentures are also risk factors for foreign body ingestion. Certain predisposing factors for ingestion of foreign bodies may be due to defective sensation of tongue, cerebro-vascular accident, stenosis due to previous surgery, adhesions and diverticula predisposing to impaction. Over and rapid eating, may also be contributing factors for ingesting fish or chicken bones [17].

Intestinal perforation by fish bones are rare with risk of perforation related to length and shape. The average time from ingestion of the foreign body to perforation is 10.4 days [18]. As the patient usually does not remember fish bone ingestion, diagnosis can be delayed, by months between ingestion and perforation [19].

Bowel perforations caused by foreign body may present with abdominal pain (95%), fever (81%) or peritonitis (39%) mimicking acute abdominal conditions like acute appendicitis, acute diverticulitis, and perforated peptic ulcer. Most commonly seen complications from fish bone ingestion are liver abscess from Perforation of the gastrointestinal tract, esophageal perforation with deep neck or mediastinal abscess formation [20] or rarely perforation through hernia sac, Meckel's diverticulum and appendix [21].

Plain radiography is helpful in locating metallic foreign bodies and pneumoperitoneum. Only 20% of the cases present with Foreign bodies complicating as pneumoperitoneum as the perforation hole is small and normally covered with omentum [19].

Ultrasound is useful as initial imaging modality for diagnosing intrabdominal abscess with fish bone seen as linear echogenic structure. US has several advantages being high flexibility, repeatability, low cost, lack of radiation and real-time imaging of abdomen. Guided aspiration of pus can be done for culture sensitivity and for confirmation of findings.

CT scan is most accurate for fish bones, appearing as linear calcified density within inflamed area. Preoperative diagnosis can be missed if clinical suspicion is not made and lack of awareness. MDCT was used in our patient to diagnose fish bone complicating as inflammatory abscess by fish bone with high degree of suspicion. Fish bone was seen as linear hyperdense structure with in the inflammatory abscess. Region of perforation is seen as thickened bowel wall, intestinal obstruction, localized pneumoperitoneum and regional fatty infiltration.

Main limitation of CT in the detection of FBs is lack of proper history and awareness by the observer. Use of thinner CT slices allows for better detection of foreign bodies than thicker slices. Orientation of fish bone with respect to an axial section affects the observer perception which can be overcome by multiplanar reconstruction of MDCT. Oral contrast can obscure fish bones in the intestinal lumen, that can be overcome by using plain water if strong suspicion of foreign body is made. Extra luminal fish bones can be mistaken for

blood vessels when IV contrast media are used that can be overcome by window alteration as fish bones have more attenuation than contrast media.

## V. CONCLUSION

Ingested Foreign bodies pass uneventfully through the GI tract in most cases with a potential to cause severe complications. Foreign body ingestion are overlooked radiologically as history is not always available and may present with nonspecific symptoms. Intestinal perforation by fish bones are rare (<1%) and usually presents with intrabdominal abscess formation. MDCT is best imaging modality for preoperative detection of fish bone with intrabdominal complications compared to plain radiographs or ultrasound. High index of suspicion and observer awareness can make timely diagnosis of fish bone and its intraabdominal complications preoperatively for surgical intervention.

## REFERENCES

- [1] Sierra-Solis A. [Bowel perforations due to fish bones: rare and curious]. *Semergen* 2013; 39: 117-118.
- [2] 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.
- [3] N. G. Velitchkov, G. I. Grigorov, J. E. Losanoff, and K. T. Kjossev, "Ingested foreign bodies of the gastrointestinal tract: retrospective analysis of 542 cases," *World Journal of Surgery* 1996; vol. 20:1001-1005.
- [4] J. I. Rodriguez-Hermosa, A. Codina-Cazador, J. M. Sirvent, A. Martin, J. Girones, and E. Garsot, "Surgically treated perforations of the gastrointestinal tract caused by ingested foreign bodies," *Colorectal Disease* 2008; 10:701-707.
- [5] A. Ayantunde and T. Oke, "A review of gastrointestinal foreign bodies," *International Journal of Clinical Practice* 2006; 60:735-739.
- [6] McCance DE, Kurchin A, Hinshaw JR. Gastrointestinal foreign bodies. *Am J Surg* 1981; 142:335-337.
- [7] Puia IC, Puia VR, Andreescu A, Cristea PG. Ascending colon perforation by ingested fruit stones. *Chirurgia (Bucur)* 2011; 106: 825-827.
- [8] Chiu JJ, Chen TL, Zhan YL. Perforation of the transverse colon by a fish bone: a case report. *J Emerg Med* 2009; 36: 345-347.
- [9] Sierra-Solis A et al. Bowel perforations due to fish bones: rare and curious. *Semergen* 2013; 39: 117-118.
- [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; 14:1918-1925.
- [11] Gonzalez JG, Gonzalez RR, Patino JV, Garcia AT, Alvarez CP, Pedrosa GSA. CT findings in gastrointestinal perforation by ingested fish bones. *J Comput Assist Tomogr* 1988; 12:88-90.
- [12] Goh BK, Tan YM, Lin SE, et al. CT in the preoperative diagnosis of fish bone perforation of the gastrointestinal tract. *AJR Am J Roentgenol* 2006; 187:710-714.
- [13] Takada M, Kashiwagi R, Sakane M, Tabata F, Kuroda Y. 3D-CT diagnosis for ingested foreign bodies. *Am J Emerg Med* 2000; 18:192-193.
- [14] Taourel P, Kessler N, Lesnik A, Blayac PM, Morcos L, Bruel JM. Non-traumatic abdominal emergencies: imaging of acute intestinal obstruction. *Eur Radiol* 2002; 12:2151-2160.
- [15] Lambert A et al. Abscess of the liver of unusual origin. *NY Med J* 1898; 177-178.
- [16] Goh BK, Chow PK, Quah HM, Ong HS, Eu KW, Ooi LL, Wong WK. Perforation of the tract secondary to ingestion of foreign bodies. *World J Surg* 2006; 30: 372-377.
- [17] Vijay Kalimuthu, Jawahar Krishnaswamy et al., Pericolic abscess due to large bowel perforation by fish bone - a case report. *International Journal of Recent Trends in Science and Technology* 2015; 13:516-518.
- [18] Sarliève P, Delabrousse E, Michalakis D, Robert A, Guichard G, Kastler B. Multidetector CT diagnosis of jejunal perforation by a chicken bone. *JBR-BTR* 2004; 87: 294-295.
- [19] Chuan-Xing Wu, Bao-Qiang Wu, Yun-Fei Duan, Dong-Lin Sun, Yong Jiang. Rare case of omentum-wrapped abscess caused by a fish bone

penetrating the terminal ileum. World J Gastroenterol 2014 August 28; 20(32):11456-11459.

- [20] Chien-Kan Chen a, Yu-Jang Su a,b,\* , Yen-Chun Lai b,c, Henry Kam-Hong Cheng a, Wen-Han Chang .Fish bone-related intra-abdominal abscess in an elderly patient 1016/j.ijid.2009;03.024.
- [21] Ginzburg L, Beller AJ. The clinical manifestations of non-metallic perforating intestinal foreign bodies. Ann Surg 1927; 86:918–939.