



Contents lists available at ScienceDirect

## International Journal of Surgery Case Reports

journal homepage: [www.casereports.com](http://www.casereports.com)

## Diagnostic dilemmas due to fish bone ingestion: Case report & literature review



Suzanne M. Beecher\*, Donal Peter O'Leary, Ray McLaughlin

Department of Surgery, University College Hospital Galway, Galway, Ireland

### ARTICLE INFO

#### Article history:

Received 25 March 2015

Received in revised form 1 May 2015

Accepted 27 June 2015

Available online 10 July 2015

### ABSTRACT

**INTRODUCTION:** The diagnosis of abdominal complications due to fish bone ingestion is particularly difficult as the presentation may mimic common abdominal pathologies.

**PRESENTATION OF CASE:** 65 year-old male presented with a two day history of right iliac fossa pain. He denied any nausea and vomiting. He had no systemic systems including fever, change in bowel habit. He had tenderness and guarding localized to the right iliac fossa. He had raised inflammatory markers. A CT scan of the abdomen was performed which showed fat standing in proximity to the terminal ileum, with the appearance of Crohn's disease. The clinical picture did not match the imaging and so the patient underwent a diagnostic laparoscopy. Findings included an acutely inflamed terminal ileum. A foreign body was identified piercing through at the small bowel wall at the terminal ileum. The foreign body was removed and revealed a fish bone. Intracorporeal sutures were inserted at the site of the microperforation. The patient was discharged well two days post operatively.

**DISCUSSION:** Fish bone perforation is not a common cause of gastrointestinal perforation. Unfortunately the history is often non-specific and these people can be misdiagnosed with acute appendicitis & other pathologies. CT scans can be useful to aid diagnostics. It is not however fully sensitive in detecting complications arising from fishbone ingestion.

**CONCLUSION:** Management therefore, should be based taking into account primarily the clinical picture & may necessitate diagnostic laparoscopy.

© 2015 The Authors. Published by Elsevier Ltd. on behalf of Surgical Associates Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

### 1. Introduction

Gastrointestinal tract perforation due to ingestion of a foreign body is not a common occurrence. Although the ingestion of foreign bodies is relatively common, the incidence of complications & bowel perforation arising from ingestion is extremely low. Objects that cause perforation are usually sharp, pointed or elongated, such as a fishbone. The perforation can occur anywhere along the gastrointestinal tract, however it usually occurs at areas of angulation or narrowing such as the terminal ileum. Depending on the type of foreign body ingested and the location of perforation, the presentation can vary considerably. It often causes confusion at presentation and can masquerade as a myriad of differential diagnoses.

In this study we present a case of fish bone perforation of the terminal ileum in which the diagnosis was not clear. We also reviewed the literature of similar obscure presentations & difficulties in diagnosis.

### 2. Presentation of case

A 65 year-old male presented to hospital with a two day history of right iliac fossa pain. The pain was localized to the right iliac fossa was sudden in onset and described as sharp and being 8/10 in severity. The pain was constant but described as being exacerbated by movements. He denied any nausea and vomiting. He had no systemic systems including fever, change in bowel habit and bleeding per rectum. He also denied urinary symptoms. In his medical history he had suffered a myocardial infarction 10 years previous and had undergone percutaneous coronary intervention with two stents inserted. He had no other relevant medical history. He was on regular aspirin, bisoprolol, and atorvastatin. He had never undergone any abdominal surgery. He had no family history of any colonic carcinoma or inflammatory bowel disease. He was an ex smoker with a 15 pack year history and worked as a cab driver.

On examination, the patient was obese, he was afebrile and haemodynamically stable. He had tenderness and guarding localized to the right iliac fossa. There was no rebound tenderness and Rovsing's sign was negative. There were no scrotal swellings. Digital rectal examination was normal and negative for occult blood.

Haematological investigations revealed a mildly elevated white cell count 11.1, with a neutrophilia of 7. His haemoglobin was

\* Corresponding author.

E-mail address: [suzub@hotmail.com](mailto:suzub@hotmail.com) (S.M. Beecher).



Fig. 1. Sagittal CT view of the abdomen – fat stranding in right iliac fossa.



Fig. 2. (a) Image at laparoscopy.



Fig. 3. Fish bone after retrieval.

normal at 13.2. He had elevated inflammatory markers including a CRP 66. His amylase was normal. Urine dipstick was normal. The erect chest radiograph and plain film of the abdomen were both normal. A CT scan of the abdomen was performed (Fig. 1). This showed right iliac fossa fat stranding in proximity to the terminal ileum. The appendix was visualized and reported as normal. The differential diagnosis at this point in time was the possibility of Crohn's disease.

The patient underwent a diagnostic laparoscopy. Findings included an acutely inflamed terminal ileum. There was a small volume of free fluid with an ileal loop adhered to anterior abdominal wall. A foreign body was identified (Fig. 2). It was a long thin material piercing through at the small bowel wall at the terminal ileum. The foreign body was removed and two intracorporeal sutures were inserted at the site of the microperforation. The foreign body was identified as a fish bone (Fig. 3). On questioning the

patient he reported eating fish a week prior to presentation. The patient was discharged well two days post operatively. At review he was well.

### 3. Discussion

The clinical presentation of bowel perforation secondary to fish bone ingestion can be hugely varied. The diagnosis is often difficult due to the large variety of sites of perforation, the frequent lack of awareness of having ingested a foreign body and the various clinical manifestations of perforation. Patients may present with fever and abdominal pain [1]. In some cases the patient may present with an acute abdomen [2]. Conversely, the abdominal pain can be longstanding prior to presentation [3]. The timing of presentation can indicate which part of the bowel is affected, with the small bowel usually presenting acutely [4]. On examination, there may be signs of peritoneal inflammation with guarding, rebound tenderness [5]. The tenderness may be localized to the area of perforation or may be diffuse across the abdomen. The presentations are usually accompanied with deranged inflammatory markers. However, the inflammatory markers may also be normal [4].

Fish bones can cause pathology in any part of the alimentary tract & can also involve adjacent organs. The clinical presentation can vary and can mimic a diverse entity of clinical conditions. Difficulties arise in diagnosing complications arising from fish bone ingestion. Patients may not recall the ingestion of a fish-bone, particularly as passage to the distal gastrointestinal tract may be preceded by a significant lag time. Typically patients have a pre-operative working diagnosis of appendicitis or diverticulitis depending on the site of tenderness. The correct pre-operative diagnosis may be made in as little as 23% of cases [4]. Other differential diagnoses that may masquerade the true diagnosis include peptic ulcer disease, pancreatic carcinoma, gastric submucosal tumour and acute cholecystitis [3,6–8].

Previous reports show 83% of all perforations caused by foreign bodies occur in the ileocecum, followed by the rectosigmoid colon [3]. Perforation in these areas can be complicated by abscess formation and peritonitis. Abscess in these areas may lead to hydronephrosis due to ureteric obstruction [9]. Perforation of a Meckel's diverticulum may also occur due to fish bone ingestion [10,11]. Fish bones can also cloud the picture in cases of incarcerated inguinal hernias or umbilical hernias [4,12]. Other rarer complications secondary to fish bone penetration of the bowel include duodenocaval fistula, bladder perforation hepato-enteric fistula & hepatic abscess formation [13–16]. Perforation in the anorectal area can lead to perianal sepsis and Fourniers gangrene [17,18].

There are multiple risk factors for bowel wall perforation by fish bones. The most important risk factor for fish bone ingestion is the use of dentures, which can be implicated in up to 80% of the cases. Dentures are believed to impair palatal sensory feedback, which otherwise provides a protective mechanism for identifying sharp and hard-textured items in a food bolus. Other less-established risk factors for accidental FB ingestion include rapid eating, extremes of age, alcohol abuse and mental retardation [19,20]. Intrinsic bowel pathology is also a risk factor for perforation by foreign bodies [21]. Fish bone ingestion is especially common in cultures where the consumption of an entire unfileted fish is considered a delicacy [22]. Acute angulations and narrowings in the bowel are the sites most commonly affected. Similarly, patients with abdominal adhesions, resulting in narrowing and acute angulation of bowel loops predisposes to perforation of the bowel wall [4].

Fish bones, unlike other foreign bodies, are not readily diagnosed on plain radiograph of the abdomen. The ability to detect a fishbone depends on the opacity of the bone, which can vary

between species [23]. It is generally considered that plain abdominal radiograph is ineffective at diagnosing fish bone ingestion [21].

Ultrasound may also be useful in detecting the presence of fish bone & associated complications. Ultrasound has a high sensitivity in detecting hyper-reflective foreign bodies, whatever their orientation, including foreign bodies that are radio-transparent. However, it is not always reliable due to factors such as the patient's body habitus, the operator's performance and the site of perforation.

CT scans in people with acute abdominal pain when the cause is not known is now a regular occurrence. Unfortunately preoperative diagnosis of the fish bone perforation can prove difficult. The diagnosis on CT imaging may also be difficult or unsuccessful. Signs on CT include visualization of a curvilinear foreign body, fat stranding, abscess formation, peritoneal effusion and pneumoperitoneum [5]. CT allows evaluation of other differential diagnoses and shows surrounding organs that may be affected. Signs of resultant bowel perforation however may not always be evident on CT [2]. In our case the CT scan showed terminal ileum fat standing and inflammation.

Our case, in addition to other cases, demonstrates that CT is not always a sensitive tool for the detection of fish bones [24]. The fact that the bone was not visualized brought the radiological diagnosis of Crohn's disease to the fore. However the patient and presentation did not fit the picture of Crohn's disease. The most common reason for overlooking a fishbone is the lack of observer awareness. The faint calcification of fish bones may also be obscured by oral contrast [25]. In cases where intravenous contrast has been given, the bone may also mimic a small blood vessel. Another potential limitation of CT scan is slice thickness. Thick conventional CT reconstructions may not include the image of the bone [21]. High quality multiplanar reconstructions are necessary for accurate diagnosis.

Despite advances in imaging many diagnoses are still made during the operation for occult symptoms of acute abdomen. Laparoscopy may be performed when the diagnosis is in doubt. In cases such as in our case when a foreign body is seen to perforate the bowel wall the decision about conversion to open laparotomy must be considered. However, it is not always necessary to do this. Removal of the fish bone and repair of the perforation may be performed laparoscopically if feasible [26]. In our case there was no peritoneal contamination & so it was managed laparoscopically. The management should be decided on an individual case-by-case basis. Many cases be managed with repair of the bowel wall, however some cases may require bowel resection and stoma formation [8]. It may also be possible to manage the condition endoscopically, provided there is no peritoneal contamination [27].

It may be difficult to operate in the acute phase if there is abscess formation and an intense inflammatory response. In such cases, conservative management with intravenous antibiotics may be employed with operative intervention delayed to a later stage. If the operative management is delayed, imaging should be repeated prior to surgery as the fish bone may migrate from the initial site & possibly arise in complications in adjacent organs [4].

#### 4. Conclusion

Fish bone perforation is not a common cause of gastrointestinal perforation. However it can cause diagnostic challenges. Unfortunately the history is often non-specific and these people can be misdiagnosed with acute appendicitis & other pathologies. In cases of abdominal pain of unknown etiology or where the presentation is obscure, CT scans can be useful to aid diagnostics. It is not however fully sensitive in detecting complications arising from fishbone ingestion. Management, therefore should be based

taking into account primarily the clinical picture and may necessitate diagnostic laparoscopy.

#### Conflict of interest

No conflict of interest.

#### Funding

None.

#### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Author contributions

Suzanne Beecher – Drafting paper.  
D.P. O'Leary – Data collection & drafting paper.  
R. McLaughlin – Editing paper.

#### References

- [1] C.K. Chen, Y.J. Su, Y.C. Lai, et al., Fish bone-related intra-abdominal abscess in an elderly patient, *Int. J. Infect. Dis.* 14 (2) (2010) e171–e172.
- [2] W.Y. Chiu, Y.J. Chen, P.C. Cheng, et al., Early presentation of bowel perforation due to fish bone ingestion, *QJM* 107 (8) (2014) 679–680.
- [3] J.J. Chiu, T.L. Chen, Y.L. Zhan, Perforation of the transverse colon by a fish bone: a case report, *J. Emerg. Med.* 36 (4) (2009) 345–347.
- [4] B.K.P. Goh, P.K.H. Chow, H.M. Quah, et al., Perforation of the gastrointestinal tract secondary to ingestion of foreign bodies, *World J. Surg.* 30 (3) (2006) 372–377.
- [5] C.E. Costa Almeida, R. Rainho, A. Gouveia, Codfish may cause acute abdomen, *Int. J. Surg. Case Rep.* 4 (11) (2013) 969–971.
- [6] B.K.P. Goh, P.R. Jeyaraj, H.S. Chan, et al., A case of fish bone perforation of the stomach mimicking a locally advanced pancreatic carcinoma, *Digest. Dis. Sci.* 49 (11–12) (2004) 1935–1937.
- [7] S.W. Kim, S.W. Kim, S.K. Song, Gastric pseudotumoral lesion caused by a fish bone mimicking a gastric submucosal tumor, *J. Gastric Cancer* 14 (3) (2014) 204–206.
- [8] A.P. Madrona, J.A.F. Hernández, M.C. Prats, et al., Intestinal perforation by foreign bodies, *Eur. J. Surg.* 166 (4) (2000) 307–309.
- [9] T. Ishimura, A. Takenaka, Y. Sakai, et al., Hydronephrosis caused by intra-abdominal abscess from cecal perforation by an ingested fish bone, *Int. J. Urol.* 13 (10) (2006) 1350–1351.
- [10] I. Dimitriou, N. Evangelou, E. Tavaki, et al., Perforation of Meckel's diverticulum by a fish bone presenting as acute appendicitis: a case report, *J. Med. Case Rep.* 7 (2013).
- [11] N.J. Mouawad, S. Hammond, C. Kaoutzanis, Perforation of Meckel's diverticulum by an intact fish bone, *BMJ Case Rep.* (2013).
- [12] M. Fuentes, M. Morales, M. Brime, et al., Fish bone within an inguinal hernia, *Eur. J. Radiol. Extra* 59 (3) (2006) 115–118.
- [13] D. Brandão, A. Canedo, M. Maia, et al., Duodenocaval fistula as a result of a fish bone perforation, *J. Vasc. Surg.* 51 (5) (2010) 1276–1278.
- [14] M.K. Cho, M.S. Lee, H.Y. Han, et al., Fish bone migration to the urinary bladder after rectosigmoid colon perforation, *World J. Gastroenterol.* 20 (22) (2014) 7075–7078.
- [15] H.K. Chen, J.R. Kuo, Y.H. Uen, et al., Liver abscess secondary to fish bone migration from the duodenum, *ANZ J. Surg.* 81 (3) (2011) 206.
- [16] Y. Kadowaki, R. Tamura, T. Okamoto, et al., Ruptured hepatic abscess caused by fish bone penetration of the duodenal wall: report of a case, *Surg. Today* 37 (11) (2007) 1018–1021.
- [17] A. Hassan, M. Abdul Saboor, F. Haider, et al., Ingested fish bone, unusual cause of perianal sepsis. A case report, *Bahrain Med. Bull.* 23 (2) (2001) 99–100.
- [18] S.K. Al Saad, T.M. Ismail, H. Al Khuder, Small bowel perforation secondary to fish bone ingestion, *Bahrain Med. Bull.* 32 (4) (2010).
- [19] G. Bathla, L.L.S. Teo, S. Dhanda, Pictorial essay: complications of a swallowed fish bone, *Indian J. Radiol. Imaging* 21 (1) (2011) 63–68.
- [20] N.G. Velitchkov, G.I. Grigorov, J.E. Losanoff, et al., Ingested foreign bodies of the gastrointestinal tract: retrospective analysis of 542 cases, *World J. Surg.* 20 (8) (1996) 1001–1005.
- [21] B. Coulier, M.H. Tancredi, A. Ramboux, CT spiral and multidetector-row CT diagnosis of perforation of the small intestine caused by ingested foreign bodies, *Eur. Radiol.* 14 (10) (2004) 1918–1925.

- [22] C.J.Y. Liew, A.C.C. Poh, T.Y. Tan, Finding nemo: imaging findings, pitfalls, and complications of ingested fish bones in the alimentary canal, *Emerg. Radiol.* 20 (4) (2013) 311–322.
- [23] S.R. Ell, A. Sprigg, The radio-opacity of fishbones – species variation, *Clin. Radiol.* 44 (2) (1991) 104–107.
- [24] Y. Choi, G. Kim, C. Shim, et al., Peritonitis with small bowel perforation caused by a fish bone in a healthy patient, *World J. Gastroenterol.* 20 (6) (2014) 1626–1629.
- [25] B.K.P. Goh, Y.M. Tan, S.E. Lin, et al., CT in the preoperative diagnosis of fish bone perforation of the gastrointestinal tract, *Am. J. Roentgenol.* 187 (3) (2006) 710–714.
- [26] W.L. Law, C.Y. Lo, Fishbone perforation of the small bowel: laparoscopic diagnosis and laparoscopically assisted management, *Surg. Lap. Endosc. Perc. Tech.* 13 (6) (2003) 392–393.
- [27] T. Yuki, S. Ishihara, M. Okada, et al., Double-balloon endoscopy for treatment of small bowel penetration by fish bone, *Digest. Endo.* 24 (4) (2012) 281.

#### Open Access

This article is published Open Access at [scimedirect.com](http://scimedirect.com). It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.