Chronic Appendicitis Caused by a Perforating Fish Bone: Case Report and Brief Literature Review

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Abstract. Background: Appendicitis caused by a foreign body is extremely rare. We report a case of chronic appendicitis caused by a perforating fish bone. Case Report: The patient was a 50-year-old Japanese man. He felt dull lower abdominal pain for 2 months and diagnosed as appendicitis caused by a perforating fish bone. He underwent emergency laparoscopic surgery. The fish bone had perforated through the appendix wall. The fish bone was initially removed followed by laparoscopic appendectomy. Pathological investigation revealed a transmural cut line of approximately 0.5 mm that was surrounded by fibrous tissue with inflammation. Conclusion: This is the first reported case of fish bone-induced chronic appendicitis that underwent laparoscopic appendectomy. For optimum outcome, a correct diagnosis based on a detailed consultation and imaging tests, and an operation performed after careful planning are needed.

Foreign bodies in the gastrointestinal tract are often seen in clinical practice. Almost all of them pass through the gastrointestinal tract and are discharged; however, they cause a perforation in approximately 1% of cases (1). Various types of foreign bodies are found in the gastrointestinal tract, such as small bones and toothpicks; however, fish bones are the most common cause of perforation of the gastrointestinal tract (2). It is known that mental illness, imprisonment, inflammatory bowel conditions, and dentures are risk factors for the accidental ingestion of foreign bodies (3).

Appendicitis is a common disease that is mainly caused by direct luminal obstruction, such as by a fecolith, lymphoid hyperplasia, impacted stool, and appendiceal or cecal tumor; however, the full range of specific causes remains unknown (4). Acute appendicitis is the usual kind of appendicitis that is often encountered, and many physicians have difficulty in recognizing appendicitis as a chronic illness. A study showed that among 225 patients who underwent an appendectomy, 16 (7%) patients had findings suggestive of chronic, recurrent, or subacute appendicitis (5). Moreover, there are few reports on appendicitis caused by foreign bodies, especially fish bones.

We describe the diagnosis and operative management of a case of late-onset appendicitis caused by the perforation of the appendix by a fish bone.

Case Report

A 50-year-old Japanese man felt a dull lower abdominal pain for 2 months and was referred to our hospital from a nearby hospital. His C-reactive protein level was high (5.67 mg/dl) and abdominal computed tomography (CT) showed a swollen appendix, which contained a sharp linear area of high density (Figure 1A and B). He was diagnosed with appendicitis caused by perforation due to a fish bone and underwent emergency laparoscopic surgery. The appendix showed remarkable swelling and rigidly adhered to the abdominal wall, greater omentum, and small intestine. After we dissected the adhesion around the appendix, we confirmed the presence of a sharp foreign body perforating the appendix wall (Figure 2A). The sharp foreign body, which was identified to be a sharp fish bone, was firstly removed followed by laparoscopic...
appendectomy. In addition, we placed a drain in Douglas’ pouch. The appendix specimen showed swelling and a rigid wall. The fish bone length was approximately 10 mm (Figure 2B). The patient had a good recovery and was discharged 6 days after the operation. Pathological investigation indicated that the fish bone was composed of eosinophilic lamellae of mature bone without viable osteocytes (Figure 3A). A transmural cut line of approximately 0.5 mm that was surrounded by fibrous tissue with inflammation was observed (Figure 3B). Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

**Discussion**

Foreign bodies usually pass through the gastrointestinal tract and are discharged; however, gastrointestinal tract perforation occurs in approximately 1% of cases (1). Various foreign bodies can cause perforation, including fish bones (63%), other bones or bone fragments (23%), and toothpicks (9%) (2). The terminal ileum and duodenal C-loop are the most frequent sites of gastrointestinal tract perforation due to the accidental ingestion of sharp foreign bodies (6). After perforation, the fish bone usually enters through the gastrointestinal wall into the intraperitoneal cavity, or in rare
cases, is discharged from the anus. Sometimes, the perforating fish bone moves to another organ, such as the liver, omentum, abdominal wall, and urethra, and causes further abscesses (7, 8).

Risk factors for the accidental ingestion of foreign bodies include mental illness, imprisonment, inflammatory bowel conditions, and dentures (3). In the current case, chronic appendicitis caused by accidental fish bone ingestion occurred.

Table 1. Review of four reported cases (including this case) of appendicitis caused by a fish bone.

<table>
<thead>
<tr>
<th>Authors, year of publication (reference number)</th>
<th>Age, sex</th>
<th>Onset</th>
<th>How to diagnose foreign body</th>
<th>Treatment</th>
<th>Complications</th>
<th>Length of stay after surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bababekov et al., 2015 (8)</td>
<td>63, M</td>
<td>1 week</td>
<td>CT</td>
<td>LA</td>
<td>None</td>
<td>2 days</td>
</tr>
<tr>
<td>Beh et al., 2016 (10)</td>
<td>72, M</td>
<td>3 days</td>
<td>CT</td>
<td>LA</td>
<td>None</td>
<td>3 days</td>
</tr>
<tr>
<td>Harhar et al., 2021 (9)</td>
<td>18, F</td>
<td>Emergency</td>
<td>CT</td>
<td>OA</td>
<td>None</td>
<td>2 days</td>
</tr>
<tr>
<td>Uchihara et al., 2021 (Current case)</td>
<td>50, M</td>
<td>2 months</td>
<td>CT</td>
<td>LA</td>
<td>None</td>
<td>6 days</td>
</tr>
</tbody>
</table>

CT: Computed tomography; M: male; F: female; LA: laparoscopic appendectomy; OA: open appendectomy.

Figure 3. Pathological findings of the resected appendix. (A) Hematoxylin and eosin staining of the fish bone. The fish bone comprises eosinophilic lamellae of mature bone without viable osteocytes. (B) Hematoxylin and eosin staining of the appendix. A transmural cut line of approximately 0.5 mm that is surrounded by fibrous tissue with inflammation is seen.
even though the patient was not elderly and did not have a mental illness. While chronic appendicitis caused by a fish bone is extremely rare, we should consider it as a differential diagnosis when imaging tests show gastrointestinal perforation. A fish bone can be detected by CT as a sharp linear area of high density, and CT is therefore effective for the diagnosis of appendicitis caused by a fish bone.

Appendicitis caused by a perforating fish bone is extremely uncommon. To our knowledge, only 4 cases (including this case) of perforated appendicitis caused by a fish bone have been reported in the literature (8–10). According to our literature review (Table I), all cases were diagnosed as appendicitis caused by a foreign body by CT and the post-operative recovery was uneventful. Of note, the current case is the only case that was diagnosed 2 months after the onset of abdominal pain. We strongly suspected that the fish bone caused the appendicitis, and the fish bone could not be removed without an operation. After surgery, our case showed a good course to recovery, as was seen in the other acute or sub-acute cases. For a good outcome, a correct diagnosis based on a detailed consultation and imaging tests, and an operation performed after careful planning are needed.

Conclusion

In summary, chronic appendicitis caused by fish bone ingestion should be considered in abdominal emergency cases.

Conflicts of Interest

The Authors have no conflicts of interest or financial ties to disclose in relation to this study.

Authors’ Contributions

TU, KY, and KA carried out the acquisition of data and drafted the manuscript. SU, NH, YK and HB gave final approval of the version to be published. All Authors read and approved the final manuscript.

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References


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