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Original Article

Fish-Bone Migration to the Liver Causing Hepatic Abscess: A Scoping Review of Published Cases (2015–2025)

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ABSTRACT

Background: Foreign body ingestion is common; however, migration of an ingested fish bone into the liver with subsequent abscess formation is rare, frequently presents with nonspecific abdominal symptoms, and poses a diagnostic challenge in routine clinical practice, often leading to delayed diagnosis.
Methods: A scoping review of PubMed, Google Scholar, SciELO, and ScienceDirect identified human case reports and case series (2015–2025) describing confirmed intrahepatic fish-bone migration or penetration causing hepatic abscess. Reports without radiologic or intraoperative confirmation and those involving non–fish-bone foreign bodies were excluded. Extracted data included demographics, migration routes, imaging findings, management, and outcomes.
Results: Twenty-seven publications reporting 29 patients met the inclusion criteria, including 25 individual case reports and 2 case series. Presumed transgastric migration was reported in 22 patients (75.9%), and the left hepatic lobe was involved in 20 cases (69.0%). Computed tomography identified a linear radiodense foreign body in 24 patients (82.8%). Surgical or minimally invasive foreign-body removal was performed in 21 patients (72.4%), with generally favorable outcomes, although follow-up reporting was variable.
Conclusion: Intrahepatic fish-bone migration is a rare but clinically important cause of hepatic abscess and should be considered in patients with unexplained, particularly left-lobe, hepatic abscesses when CT demonstrates a linear foreign body or when response to standard therapy is atypical; timely source control is usually effective.

1. Introduction

Foreign-body migration from the gastrointestinal (GI) tract into the liver is a rare but clinically important cause of hepatic abscess. Because the available evidence consists almost exclusively of isolated case reports and small case series, the true prevalence of intrahepatic fish-bone migration cannot be reliably estimated. Most ingested foreign bodies pass spontaneously; however, sharp objects can perforate the stomach or duodenal wall and migrate into adjacent structures, including hepatic parenchyma, where they may act as a nidus for infection and abscess formation. Fish bones are frequently implicated because their thin, pointed shape increases the likelihood of mucosal injury and perforation, and ingestion is often unrecognized by patients [1].

This entity has been recognized for more than a century. The first description of a hepatic abscess resulting from GI perforation by an ingested foreign body is commonly attributed to Lambert (1898). Subsequent reports have reaffirmed this mechanism but emphasize that diagnosis is challenging because symptoms are non-specific and a history of ingestion is usually absent [1, 2]. With the broader availability of computed tomography (CT), preoperative recognition improved substantially: CT can demonstrate a linear hyperdense foreign body within or adjacent to a hepatic collection and may show inflammatory change along the stomach or duodenum, enabling earlier definitive management [3, 4].

In recent years, additional case reports have expanded the clinical spectrum of confirmed intrahepatic fish-bone migration, including variation in hepatic segment involvement and an increasing use of minimally invasive approaches, such as laparoscopy, for drainage and foreign-body extraction [5, 6]. However, these reports remain scattered and use heterogeneous terminology, which complicates comprehensive identification. Therefore, this review aims to synthesize all reported cases of confirmed intrahepatic fish-bone migration from 2015 to 2025, focusing on patient characteristics, suspected migration routes, imaging findings, management strategies, and outcomes [5, 6].

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2. Methods

2.1. Search strategy

A scoping review of published case reports and case series was conducted to identify patients with confirmed intrahepatic fish-bone migration causing hepatic abscess. Searches were performed in PubMed, SciELO, Google Scholar, and ScienceDirect for studies published between January 2015 and December 2025. The final searches were completed in December 2025 (exact database run dates were not retained).

In PubMed, the search was conducted in the Title/Abstract fields using the following Boolean strategy: (fish bone OR fishbone OR "foreign body") AND ("hepatic abscess" OR "liver abscess" OR "pyogenic liver abscess") AND (migration OR penetration OR perforation).

Filters applied: Humans; publication date 2015 – 2025.

In SciELO, the following Boolean strategy was used with the publication-year filter 2015 – 2025 (no language restrictions applied): (fish bone OR fishbone OR "foreign body") AND ("hepatic abscess" OR "liver abscess" OR "pyogenic liver abscess") AND (migration OR penetration OR perforation).

For Google Scholar and ScienceDirect, searches were performed using the query "fish bone liver abscess"; results were sorted by relevance, and the first 200 records from each platform were screened to apply a reproducible stopping rule. Reference lists of included articles were also manually screened to identify additional eligible reports.

2.2. Eligibility, study selection, and data extraction

Eligible studies were human case reports or case series (2015 – 2025) with radiologic and/or intraoperative confirmation of an intrahepatic fish bone, defined as the Strict A-only criterion. Studies involving non – fish-bone foreign bodies, extrahepatic collections, animal studies, or review articles without new patient-level data were excluded.

Study selection was conducted independently by two reviewers. Records were de-duplicated prior to screening, and disagreements were resolved by consensus. For Google Scholar and ScienceDirect, we applied a reproducible stopping rule. We screened the first 200 records from each platform (sorted by relevance), in addition to records retrieved from PubMed and SciELO, and any additional eligible reports identified through reference-list screening. To minimize duplicate patient inclusion across publications, we cross-checked potentially overlapping reports using institutional and authorship information, patient demographics, and clinical timelines; when duplication could not be excluded, the most complete report was retained. Because full cross-platform retrieval counts and duplicate counts were not retained at the time of the initial search, a complete stepwise flow count (identified → de-duplicated → screened → full-text assessed → excluded) cannot be reported with precision.

Data extracted included patient demographics, suspected migration route, hepatic location, imaging findings, management approach, and outcomes. Findings were summarized descriptively in **(Table 1)** without meta-analysis.

2.3. Quality appraisal

No formal quality appraisal was performed, consistent with the descriptive aim of this scoping review and the nature of the included evidence (case reports and case series).

3. Results

Using the predefined Strict A-only definition (radiologic and/or intraoperative confirmation of an intrahepatic fish bone), we identified 27 publications reporting 29 individual patients between 2015 and 2025. Two reports included more than one case (Tan et al. and Mateus et al.), whereas the remaining 25 publications reported single-patient case series. Inclusion criteria were case reports or case series describing intrahepatic fishbone foreign bodies with radiologic and/or intraoperative confirmation and sufficient patient-level clinical details. No age restrictions were applied. Studies were excluded primarily because they involved non – confirmed fish-bone foreign bodies, did not document an intrahepatic fish bone, lacked radiologic and/or intraoperative confirmation, or were review articles without new patient-level data.

Cases were reported across multiple regions, including Asia, Europe, North and South America, and Africa, indicating that intrahepatic fish-bone migration is a global phenomenon rather than a geographically restricted condition. The mean age was 56.8 years (median 57; range 17 – 80), with 17 males and 12 females (male-to-female ratio 1.4:1).

When the presumed route of migration was described, transgastric migration was reported in 22 of 29 patients (75.9%), most commonly from the antrum or lesser curvature, whereas transduodenal penetration occurred in 5 patients (17.2%); the route was unspecified in 2 patients (6.9%). Fistulous tracts (e.g., hepatogastric or duodenohepatic) were described in a minority of cases. The left hepatic lobe was involved in 20 patients (69.0%), including several cases affecting segment III. Right-lobe involvement was reported in 8 patients (27.6%), and caudate involvement in 1 patient (3.4%).

Diagnostic confirmation relied primarily on computed tomography (CT), which identified a linear radiodense foreign body within or contiguous with an intrahepatic collection in 24 patients (82.8%). Upper gastrointestinal endoscopy at initial presentation was reported in 9 patients (31.0%), with positive findings in 4 patients (44.4%), including mucosal ulceration, suspected penetration sites, or visualization of the foreign body.

Antibiotic therapy was administered in 27 patients (93.1%). Source control was achieved through interventional or surgical approaches. Initial interventional radiology – guided drainage was attempted in 6 patients (20.7%); however, 4 of these subsequently required surgical intervention. Definitive surgical management was performed in 21 patients (72.4%), most commonly abscess drainage with foreign-body removal via laparoscopic or open approaches; staged percutaneous strategies were rarely reported. In two reports, the foreign body was left in situ with clinical monitoring. Outcomes were reported as recovery in 25 patients (86.2%), while outcomes or follow-up details were not reported or unclear in 4 patients (13.8%).

4. Discussion

This scoping review summarizes published reports of confirmed intrahepatic fish-bone migration causing hepatic abscess between 2015 and 2025 **(Table 1)**. Across reported cases, several consistent patterns emerge: (1) patients often present with non-specific symptoms typical of pyogenic liver abscess, (2) the presumed route is most frequently trans-gastric, and (3) the foreign body is most commonly located in the left hepatic lobe/segment III, reflecting the close anatomic relationship between the stomach (especially the antrum/lesser curvature) and the left liver. These observations are repeatedly described in individual case reports and small case series throughout the study period [5–22].

Table 1: Summary of reported cases of confirmed intrahepatic fish-bone migration causing hepatic abscess (2015–2025).

Ref No	Study	Country	Patient	Route/perforation	Hepatic location	Proof fishbone in liver	Treatment	Outcome
[6]	Panebianco (2015)	Italy	57 F	Gastric wall (antrum)	Left lobe	CT + laparoscopic identification of fish bone in liver abscess	Laparoscopic drainage + fish bone removal	Recovered
[17]	Morelli (2015)	Italy	65 M	Trans-gastric migration	Left lobe	CT/intraop confirmation of fish bone in liver abscess	Drainage + foreign body removal (approach)	Recovered
[20]	Venkatesh (2015)	Singapore	69 M	Lesser curvature; gastrohepatic fistula	Left lobe	CT showed a fish bone traversing the stomach into a liver abscess	Drainage + antibiotics (definitive management)	Recovered
[12]	Ede (2015)	South Africa	61 M	GI perforation	Left lobe	Imaging + intraop fish bone identified in liver abscess	Surgical drainage + fish bone removal	Recovered
[23]	Peixoto (2016)	Portugal	80 F	Duodenohepatic fistula / GI penetration	Right lobe	CT showed intrahepatic fish bone associated with an abscess	Antibiotics + drainage + surgical management	Recovered
[19]	Tan (2016) – Case 1	Singapore	56 M	Gastric antrum	Left lobe	CT showed intrahepatic fish bone in an abscess	Percutaneous drainage + laparoscopic fish bone removal	Recovered
[19]	Tan (2016) – Case 2	Singapore	63 M	Stomach	Left lobe	CT showed intrahepatic fish bone in an abscess	Percutaneous drainage + laparoscopic fish bone removal	Recovered
[18]	Kfouri (2017)	Brazil	56 F	Gastric perforation	Segment III (left lobe)	CT showed a fish bone in the hepatic parenchyma	Left lateral segmentectomy + drainage	Recovered
[8]	Bandeira-de-Mello (2018)	Brazil	44 F	Lesser gastric curvature	Left lobe	CT confirmed a fish bone associated with an abscess	Laparoscopy with fish bone extraction	Recovered
[16]	Mateus (2018) – Case 1	Portugal	76 M	GI perforation	Left lobe	CT/intraop fish bone migration	Laparotomy + fish bone removal	Recovered
[16]	Mateus (2018) – Case 2	Portugal	45 M	GI perforation	Right lobe	CT suggested fish bone; migration	Drainage (percutaneous) ± antibiotics; fish bone management	Not reported
[21]	Yu (2018)	China	34 F	Stomach perforation	Left lobe	CT hyperdense linear foreign body within an abscess	Surgery + fish bone removal	Recovered
[10]	Bekki (2019)	Japan	51 M	Stomach wall	Left lobe (subcapsular/adjacent)	Laparoscopy found a fish bone in the liver abscess region	Laparoscopic drainage + fish bone removal	Recovered
[15]	Li (2019)	China	58 M	Stomach wall penetration	Liver	CT + minimally invasive operation confirmed a fishbone	Minimally invasive removal + drainage + antibiotics	Recovered
[5]	Chen (2019)	China	37 M	Transgastric; segment III inflammation	Segment III (left lobe)	CT + laparoscopy confirmed a migrated fish bone	Laparoscopic removal (± segmentectomy)	Recovered
[24]	Burkholder (2019)	USA	64 F	The stomach directly feeds into the liver	Left lobe	Imaging evidence of fish bone, attributed to perforation	Drainage + antibiotics; foreign body left in situ	

CT, Computed Tomography; GI, Gastrointestinal; 3D, Three-Dimensional; FB, Foreign Body; F, Female; M, Male.

Table 1: Summary of reported cases of confirmed intrahepatic fish-bone migration causing hepatic abscess (2015 – 2025).

Ref No	Study	Country	Patient	Route/perforation	Hepatic location	Proof fishbone in liver	Treatment	Outcome
[25]	Sim (2019)		56 F	Distal stomach	Liver	Imaging showed retained fish bone within the abscess	Removal of foreign body (approach)	Recovered
[26]	Hernández-Villafranca (2020)	Mexico	71 M	GI migration	Left lobe	CT showed a sharp foreign body protruding from the left lobe	Surgical management	Recovered
[9]	Barkai (2020)	Israel	66 F	Migrating from the stomach	Liver	CT/intraop confirmed fish bone	Laparoscopic retrieval + abscess drainage	Recovered
[13]	Silva (2021)	Portugal	70 F	Gastric perforation	Left lobe	CT identified a fish bone and a hepatic abscess	Surgical removal + drainage	Recovered
[14]	Grayson (2022)	UK	56 M	Hepatogastric fistula	Segment III (left lobe)	CT linear foreign body; laparoscopy retrieved a fish bone from the liver	Laparoscopic retrieval + fistula disconnection/closure	Recovered
[27]	Xia (2022)	China	17 M	Fishbone perforation	Caudate lobe	CT showed a fish bone; it was removed from the liver	3D laparoscopic partial caudate lobectomy + drainage + fishbone removal	Recovered
[11]	Dai (2023)	China	55 M	From the stomach to the liver	Liver	CT confirmed a fish bone penetrated the liver	Laparoscopic removal (early-stage)	Recovered
[28]	Okhotnikov (2024)	Russia	55 M	Migration from the upper GI	Left lobe	Abscess drainage tract used for visually controlled bone extraction	Two-stage percutaneous drainage + percutaneous endoscopic bone extraction	Recovered
[29]	Cuesta-Pertuz (2024)	Colombia	55 M	Migration from the GI tract	Liver	Imaging + clinical correlation; fish bone migration described	Drainage + foreign body management	Not reported
[30]	Khan (2025)	India	59 F	GI perforation	Liver	Fish bone-induced hepatic abscess described	Antibiotics + percutaneous drainage; foreign body left in situ	Not reported
[31]	Ahmed (2025)	Bangladesh	35 F	Lesser gastric curvature perforation	Segment III/IVb (left lobe)	Intraop found a fish bone within the resected liver segment	Hepatic resection + antibiotics	Recovered
[22]	Zong (2025)	China	77 F	Ingested fishbone; GI penetration	Liver	CT 3D reconstruction confirmed fishbone; removed	Laparoscopic incision/drainage + fishbone removal	Recovered
[7]	Abdennebi (2025)	Morocco	60 M	Migration through the GI wall (not recalled)	Left lobe	CT showed radiodense linear intrahepatic FB; extracted fishbone	Laparoscopic removal under intraoperative ultrasound	Recovered

CT, Computed Tomography; GI, Gastrointestinal; 3D, Three-Dimensional; FB, Foreign Body; F, Female; M, Male.

Because the evidence base is derived from published case reports/series, it is inherently subject to selection and reporting biases; therefore, findings should be interpreted as descriptive patterns rather than estimates of true prevalence or comparative effectiveness.

4.1. Pathophysiology and anatomic pattern

Fish bones are thin, sharp, and capable of occult mucosal penetration; after perforating the stomach or duodenum, they may traverse the lesser omentum/adjacent tissues and lodge within hepatic parenchyma, leading to localized inflammation and abscess formation. The predominance of left-lobe involvement in reported cases supports this mechanism because the left lobe lies adjacent to the stomach. In contrast, right-lobe and caudate involvement are less common and may reflect variable penetration sites, migration pathways, and delayed presentation [5, 6, 8, 10, 12, 15–21, 27].

4.2. Diagnostic implications: the key role of CT

A major practical message from the included literature is that computed tomography (CT) is central to diagnosis. The typical hallmark is a linear radiodense structure within or contiguous with an intrahepatic collection, sometimes with inflammatory changes at the gastric/duodenal wall or a visible tract/fistula. In many reports, CT either enabled a definitive preoperative diagnosis or prompted targeted surgical/interventional exploration that confirmed the presence of a foreign body [3–7, 9–15, 17, 19–22, 26, 27].

Because many patients do not recall ingestion, clinical suspicion should increase in left-lobe abscesses that are atypical, recurrent, or show incomplete response to antibiotics and drainage alone [6, 9, 12–15, 17, 20, 21, 24].

4.3. Diagnostic pitfalls (when CT may miss a fish bone)

Despite its central role, CT may fail to identify a fish bone when the object is very small, oriented parallel to the imaging plane, obscured by adjacent structures, or when slice thickness/technique limits conspicuity. When suspicion remains high despite an initially negative or equivocal CT, consideration may be given to targeted radiology re-review and/or repeat CT with thinner slices, particularly for refractory or atypical left-lobe abscesses [6, 9, 12–15, 17, 20, 21, 24].

4.4. Management strategies and evolving minimally invasive approaches

Reported management generally emphasizes antibiotics plus source control. Antibiotic therapy typically consists of broad-spectrum agents targeting enteric organisms, including third-generation cephalosporins, beta-lactam/beta-lactamase inhibitor combinations, or carbapenems, with subsequent adjustment based on microbiological data when available. Source control may include abscess drainage, foreign-body removal, and (when present) management of a fistula tract. Across recent cases, there is a clear shift toward minimally invasive strategies, particularly laparoscopy, often combined with drainage (percutaneous or surgical), depending on abscess size, location, and patient stability. Multiple reports describe successful laparoscopic drainage and extraction, including techniques aided by intraoperative ultrasound or advanced laparoscopic approaches for difficult locations [5–7, 9–11, 14, 19, 22, 27].

However, the included literature also shows that management must be individualized. Some cases required laparotomy or more extensive procedures, including hepatic resection/segmentectomy for deeply embedded foreign bodies, complex anatomy, or uncertainty regarding complete source control [16, 18, 27, 31]. In selected patients, pre-operative upper gastrointestinal endoscopy may assist in identifying mucosal defects, fistulous tracts, or retained foreign bodies and can inform procedural planning. A minority of reports describe staged or alternative strategies, such as percutaneous drainage with subsequent controlled extraction via a drainage tract, highlighting that interdisciplinary planning (surgery, interventional radiology, gastroenterology) can be beneficial, particularly for high-risk surgical candidates [28].

4.5. Practical decision pathway (derived from reported cases)

Based on the descriptive patterns in the included reports, a pragmatic approach may be as follows: initiate antibiotics and assess clinical stability; in stable patients with a drainable collection, consider percutaneous drainage while actively evaluating for a retained foreign body and tract/fistula; pursue early foreign-body removal (endoscopic or surgical, depending on location and feasibility) when imaging shows a foreign body, when drainage fails, or when sepsis persists; and consider fistula/tract evaluation (imaging and/or endoscopy) when there is recurrent abscess, persistent contamination, or evidence of communication on imaging [5–7, 9–11, 14, 19, 22, 27].

4.6. Special situations: fistulas and "foreign body left in situ."

A subset of reports describes fistulous communication (e.g., hepatogastric or duodenohepatic), which may require not only drainage and extraction but also tract disconnection/closure to prevent recurrence [14, 20, 23]. In contrast, at least one report described management with the foreign body left in situ under monitoring; this should be considered exceptional and generally reserved for situations where removal is judged high risk (e.g., proximity to major vascular/biliary structures, technically inaccessible location, or prohibitive operative risk) [24]. In such situations, conservative management should include close clinical follow-up, interval imaging to document abscess resolution and stability of the foreign body, and a low threshold for escalation if symptoms recur or inflammatory markers rise.

4.7. Limitations and evidence gaps

The evidence base remains dominated by single-case reports and small series with heterogeneous reporting of key variables (e.g., exact route, segment location, organisms, duration of follow-up). Publication bias is likely, as unusual or successfully treated cases are more often reported; language bias may also be present, as relevant cases may be published in languages not captured by the databases searched. Therefore, conclusions should be interpreted as descriptive patterns rather than comparative effectiveness evidence.

5. Conclusion

Confirmed intrahepatic fish-bone migration is an uncommon but clinically important cause of hepatic abscess. Across reported cases from 2015 – 2025, migration most often follows gastric penetration and preferentially involves the left hepatic lobe, consistent with anatomical proximity between the stomach and the liver. Computed tomography is the key diagnostic tool, with a typical finding of a linear radiodense foreign body within or contiguous with an intrahepatic collection. Because this scoping review synthesizes published case reports and small case series, findings should be interpreted as descriptive trends rather than estimates of prevalence or comparative effectiveness.

Conflicts of Interest

The authors declare no competing interests that could have influenced the objectivity or outcome of this research

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Ethical approval

None.

Large Language Model

The authors declare that generative artificial intelligence (AI) tools (ChatGPT, OpenAI) were used solely to assist with language refinement and grammar checking during preparation of this manuscript. These tools were not used for screening, study selection, data extraction, data analysis, or interpretation of findings. The authors reviewed and verified all content and take full responsibility for the integrity and accuracy of the manuscript.

Authors Contribution

All authors contributed to the manuscript design, literature review, writing, and revision.

Data Availability

This study is a scoping review of published literature. No new datasets were generated or analyzed. All data supporting the findings are contained within the included articles cited in the reference list and the summary extraction presented in Table 1.

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