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General Surgery

KEY WORDS: hepatic abscess; pyogenic liver abscess; hepatopleural fistula; empyema; percutaneous catheter drainage; surgical case series

COMPLICATED HEPATIC ABSCESS AT A TERTIARY CARE HOSPITAL OF SOUTH GUJARAT

Krushang Pareshbhai Lathiya yr resident of General Surgery Department, New Civil Hospital and Government Medical College, Surat, Gujarat, India

Ayush. Shah M.B.B.S. student, New Civil Hospital and Government Medical College, Surat, Gujarat, India

Dipen Shah Assistant professor general surgery department, New Civil Hospital and Government Medical College, Surat, Gujarat, India

Sandip Kansal* Additional professor of general surgery, New Civil Hospital and Government Medical College, Surat, Gujarat, India*Corresponding Author

ABSTRACT

Background: Most hepatic abscesses respond well to antibiotics and image-guided drainage, yet it ruptures into neighbouring cavities and follows a more difficult surgical treatment . This report examines 15 admissions for liver abscess treated within one surgical unit, focusing on how complications developed, how far disease spread radiologically, what source-control measures were used, and how patients recover before discharge. **Methods:** Discharge summaries and investigation files were reviewed. Data captured included patient demographics, presenting complaints, blood and biochemical values, imaging findings, coexisting illness, complications encountered, interventions performed, antibiotics prescribed, and status at the time of discharge. Any variable absent from the chart was labelled "not documented" rather than estimated. **Results:** Across the 15 patients , there were 13 men and 2 women aged 20 to 70 years (mean 45.1, median 50). Thoracic involvement was recorded in six patients and frank rupture in six. Bowel-related inflammation — ileocolitis or secondary appendiceal involvement — was noted in five. Eight patients underwent image-guided aspiration or catheter drainage, and two developed hepatic-vein thrombosis. One individual arrived hypotensive with severe metabolic derangement secondary to poorly controlled diabetes. A single, protracted thoracic case yielded repeated pleural and purulent cultures growing multidrug-resistant Pseudomonas aeruginosa. The available records show no in-hospital deaths, but a number of patients left before treatment was finished, against medical advice or by request, which limits what can be concluded about mortality and longer-term recovery. **Conclusion:** Difficulty in this cohort arose not from the abscess itself but from what it did beyond the liver — rupture, spread into the pleura, peritoneal soiling, venous thrombosis, and collections that kept recurring and required repeated drainage. Prompt radiological mapping of extrahepatic spread and thorough source control emerge as recurring themes. Given the modest cohort size and gaps in follow-up, these findings are best treated as descriptive and hypothesis-generating rather than conclusive.

1. INTRODUCTION

Hepatic abscess continues to bring patients to surgical units, especially when the collection is large, well liquefied, multiloculated, or has already tracked beyond the liver capsule. Symptoms at presentation are frequently vague, and the diagnosis usually rests on ultrasonography or contrast-enhanced computed tomography (CT). Most straightforward cases respond to antimicrobial treatment supplemented, where needed, by percutaneous drainage. Management becomes considerably more demanding once the abscess erodes through the liver surface into the peritoneal or pleural space, or gives rise to a chronic organised pleural collection.

This series draws on 15 discharge records from the General Surgery Unit at New Civil Hospital, Surat. Rather than estimating how often complications occur across all liver-abscess patients, the intent here is to characterise how complicated presentations unfolded and were treated within a surgical setting.

2. AIM AND OBJECTIVES

Primary aim: To characterise the spectrum of complications observed among patients with liver abscess treated in a surgical unit.

Secondary objectives: To record clinical presentation and imaging features; to catalogue local and systemic complications noted at admission; to outline the drainage and thoracic interventions used for source control; and to set the observed pattern against previously published series.

3. MATERIALS AND METHODS

Design and setting

A retrospective, descriptive review of discharge cards drawn from the General Surgery Unit, New Civil Hospital, Surat.

Study population

The original record set carried 16 patient . One individual, treated laparoscopically for gallstone disease with a dilated common bile duct but without any documented liver abscess, was excluded, leaving 15 qualifying cases. Two admissions from 2018 belonging to the same individual were counted separately, since each represented a distinct hospital stay.

Inclusion criteria

- Adults aged 18 years or older at admission.
- A liver-abscess diagnosis confirmed in the record and supported by ultrasound and/or contrast-enhanced CT, with a focal hepatic collection described as an abscess, a liquefied or partially liquefied abscess.
- Treatment under the General Surgery Department, at New Civil Hospital, Surat, within the period covered by the available records (September 2017 to August 2026).
- Both uncomplicated and complicated presentations qualified for inclusion; given the study's focus on complications, particular note was taken of rupture, thoracic spread, peritoneal contamination, bowel inflammation, vascular thrombosis, hemodynamic compromise, and thromboembolic events.
- Every distinct hospitalisation was treated as it separate case; a later, separate admission for the same patient was counted independently whenever it reflected a fresh clinical presentation.

Exclusion criteria

- Patients under 18 years of age.
- Charts in which a liver abscess could not be confirmed clinically or on imaging.
- Non-infective focal hepatic lesions — simple cysts, hydatid cysts, hematomas, necrotic tumours and similar — unless an abscess was also documented.
- Records lacking sufficient detail to confirm the presence of a liver abscess.

Data collection

Data were drawn from recorded history, laboratory reports, ultrasound and CT studies, chest radiographs, procedure notes, microbiology reports, treatment charts, and discharge instructions

A missing variable was marked "not documented"; no attempt was made to back-fill absent laboratory values or to assign a cause not supported by the chart.

Outcome assessment

Outcomes of interest included rupture, thoracic extension, peritoneal contamination, associated bowel inflammation, vascular thrombosis, requirement for percutaneous drainage, requirement for chest-tube drainage, need for repeated or prolonged procedures, and documented status at discharge. Given incomplete long-term follow-up, recurrence and 30-/90-day mortality could not be assessed.

Statistical approach

Findings are summarised descriptively: continuous variables as means and medians where appropriate, categorical variables as counts and percentages. No multivariable modelling was undertaken, given the small and heterogeneous sample. Reported percentages describe the composition of this particular surgical cohort and do not represent population-level incidence..

4. RESULTS

4.1 Cohort profile and summary findings

Table 1. Baseline Features and Principal Outcome Variables Across the 15 Cases Reviewed.

Variable	Finding
Number of clinical episodes	15
Male / female	13 / 2
Age range	20–70 years
Mean age	45.1 years
Median age	50 years
Documented thoracic involvement	6 (40.0%)
Documented rupture	6 (40.0%)
Peritoneal rupture / peritonitis	3 (20.0%)
Bowel inflammation / ileocolitis / secondary appendiceal inflammation	5 (33.3%)
Hepatic-vein thrombosis	2 (13.3%)
Image-guided drainage / aspiration	8 (53.3%)
Documented hypotension / shock physiology	1 (6.7%)
Pulmonary embolism	1 (6.7%)
MDR Pseudomonas aeruginosa documented	1 (6.7%)
Documented in-hospital death	0

Variable	Finding
Reliable long-term outcome available	No

These proportions characterise this particular 15-case cohort and must not be read as the frequency of complications among liver-abscess patients generally, whether in this hospital or elsewhere.

1.1 Composition of the Cohort, Illustrated

The charts below give a visual breakdown of the 15 cases reviewed. Their purpose is descriptive
— to show how this particular surgical cohort was composed
— rather than to estimate how common these features are in the wider population of liver-abscess patients.

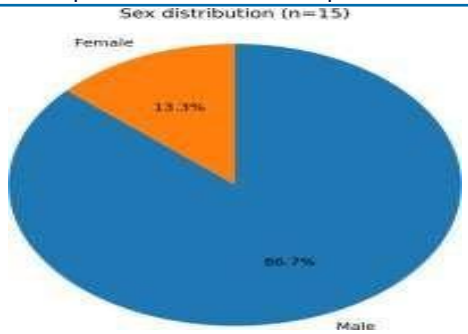

Figure 1. Breakdown of the 15 Clinical Cases by Sex.

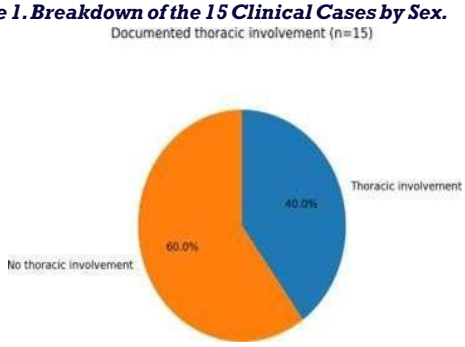

Figure 2. Proportion of Cases with Documented Thoracic Involvement.

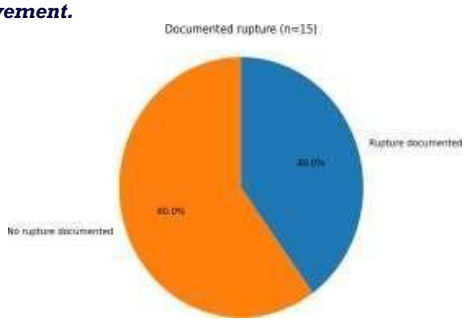

Figure 3. Proportion Oo Cases with Documented Rupture.

2. Case-wise Clinical Analysis

Case 1 — man, 40 years

Diagnosis: Empyema necessitans with liver abscess.

One month of pain at the site of a prior ICD placement, followed by two days of swelling and discharge. Hb

11.4 g/dL, TLC 8,400/mm³, creatinine 0.87 mg/dL, INR 1.0. CT identified a liquefied collection in segments VI–VII abutting the liver surface, alongside a sizeable loculated right pleural collection (roughly 360 cc) and a sinus tract through the chest wall. Ultrasound corroborated a partially liquefied hepatic abscess with a large right thoracic collection and underlying lung collapse. Drainage of both the liver collection and the pleural space was proposed but declined by the patient. He was started on levofloxacin and metronidazole and subsequently left against medical advice with treatment incomplete.

Comment: *Hepatopleural disease complicated by an external sinus tract (empyema necessitans); source control remained incomplete because the patient withheld consent.*

Case 2 — Man, 54Years

Diagnosis: Gallstone disease with multiple liver abscesses.

Fifteen days of right upper-quadrant pain. Hb 9.8 g/dL, TLC 8,600/mm³, creatinine 1.0 mg/dL, glucose 177 mg/dL. Imaging (CT and USG) revealed several partially liquefied abscesses concentrated in the right lobe, the largest measuring roughly 2.6 cm on CT and up to 4.3 cm on ultrasound; multiple gallstones were also seen. No rupture or

drainage procedure was recorded. Treatment consisted of cefosulbactam, metronidazole and amikacin, later switched to oral cefixime and metronidazole.

Comment: *Several modest-sized abscesses coexisting with gallstone disease, without any recorded extrahepatic rupture.*

Case 3 — Man, 28 Years
Diagnosis: Appendicitis with liver abscess.

Twenty days of fever with chills, plus ten days of cough and abdominal pain. Hb 7.3 g/dL, TLC 5,600/mm³, creatinine 0.8 mg/dL. Ultrasound showed a large liquefied collection (about 530 cc) in segments VI–VII reaching the liver surface, together with inflammation of the ileocecal junction and appendix. Neither drainage nor appendicectomy was performed during this brief admission; he was discharged against medical advice on oral cefixime and metronidazole.

Comment: *Liver abscess accompanied by inflammatory change in the appendix and ileocecal region.*

Case 4 — Man, 55 Years
Diagnosis: Multiple liver abscesses.
Three days of fever and headache, then one day of abdominal pain. Hb 13.2 g/dL, TLC 7,700/ mm³, creatinine 1.0 mg/dL. Ultrasound demonstrated multiple partially liquefied lesions across both hepatic lobes— several in the right lobe and one in the left. He stayed clinically stable throughout and was managed medically with ceftriaxone, metronidazole and amikacin; discharge occurred at his own request.

Comment: *Bilobar, multifocal disease without any documented major rupture, shock, or thoracic complication.*

Case 5 — Man, 45 Years
Diagnosis: Liver abscess with colitis.

Four days of abdominal pain. Hb 13.5 g/dL, TLC 9,100/mm³, creatinine 0.9 mg/dL. Ultrasound identified a roughly 2.5-cm partially liquefied abscess in the left lobe together with inflammatory thickening spanning the terminal ileum, ileocecal junction, caecum and ascending colon. He was managed conservatively with ceftriaxone and metronidazole and discharged in stable condition.

Comment: *Hepatic abscess occurring alongside concurrent infective or inflammatory bowel changes.*

Case 6 — Man, 24 Years
Diagnosis: Multiple liver abscesses with intraperitoneal and intrathoracic rupture.

One month of abdominal pain. Initial ultrasound showed several large, partially liquefied collections in both lobes, some reaching the capsular surface, with subcapsular extension and free intraperitoneal fluid.

Subsequent CT confirmed multifocal abscesses communicating with subcapsular collections, a tract extending toward the right paracolic gutter with associated peritonitis, and communication between the segment VII collection and the right pleural space consistent with possible intrathoracic rupture; a subdiaphragmatic abscess was also present.

Source control required a Malecot catheter in the primary hepatic collection, a right-sided ICD, and further Malecot catheters in segments 4, 7/8 and 2; initial drainage yielded 100 cc of hepatic pus and 200 cc of pleural pus. Repeated imaging, further drainage and prolonged antibiotics were all required.

Comment: *The most extensive disease pattern in the cohort — bilateral hepatic involvement, subcapsular collections, peritonitis, a paracolic collection, a subdiaphragmatic abscess and rupture into the right pleura.*

Case 7 — Man, 55 Years
Diagnosis: Liquefied liver abscess with hypotension.

Seven days of abdominal pain and three days of breathlessness. Hb 10.7 g/dL, TLC 24,500/mm³, creatinine

2.4 mg/dL, glucose 263 mg/dL, HbA1c 13.4%, serum ketones positive. Ultrasound showed a segment VII abscess reaching the hepatic surface plus a small right pleural collection with underlying consolidation. Management required insulin infusion, fluid resuscitation, and vasopressor support with noradrenaline and vasopressin; a Malecot catheter was placed. Blood pressure was 90/60 mmHg at the time the patient left against medical advice.

Comment: *Marked systemic compromise — pronounced leukocytosis, acute kidney injury and severe, poorly controlled diabetes — in a patient who departed before treatment was complete.*

Case 8 — Man, 70 Years
Diagnosis: Liver abscess with secondary ileocolitis and rupture.

Three days of abdominal pain, nausea, vomiting and fever. CT revealed a large abscess in segments IVA/IVB rupturing into the subcapsular space, with surrounding inflammatory change and partial thrombosis of the middle hepatic vein; further developing abscesses were noted in segments V and VIII. Inflammatory involvement extended across the terminal ileum, ileocecal junction, caecum, ascending colon and hepatic flexure, with secondary appendiceal inflammation. A pigtail catheter placed into segments IVB/V drained about 50 cc of pus. He subsequently left against medical advice with the drain still in place.

Comment: *Rupture with a subcapsular collection, hepatic-vein thrombosis, and extensive secondary bowel/appendiceal inflammation.*

Case 9 — Woman, 25 Years
Diagnosis: Pregnancy with HIV reactivity, multifocal liver abscess and pulmonary embolism.

Twenty-three weeks pregnant, with documented moderate anemia and HIV reactivity, presenting with five days of fever and abdominal pain. ESR measured 101 mm/h and D-dimer 5158, with positive FDP. Ultrasound revealed multiple large, partially liquefied lesions spanning segments V, VI, VII, VIII and the left lobe, accompanied by free fluid and a right pleural collection with consolidation. Pigtail drainage was carried out, followed later by image-guided aspiration of a residual cavity. During admission she developed respiratory compromise, chills and rigors, and pulmonary thromboembolism. Treatment progressed from ceftriaxone/metronidazole to meropenem, then low-molecular-weight heparin and subsequently warfarin with INR monitoring. She was discharged in stable condition.

Comment: *Widespread hepatic suppuration occurring in a high-risk physiological state, complicated by pulmonary thromboembolism and respiratory deterioration.*

Case 10 — Man, 57 Years
Diagnosis: Liver abscess with subcapsular collection and right intrathoracic rupture.

A known case, transferred following prior treatment elsewhere and an earlier discharge against medical advice; an ICD and two pigtail catheters were already in place on arrival. Hb 8.3 g/dL, platelets 622,000/mm³, creatinine 0.78 mg/dL. Imaging showed residual, incompletely liquefied abscesses in segments VII/VIII and an organised right thoracic-wall collection; pleural-fluid analysis showed predominantly

neutrophilic inflammation. The thoracic collection proved too organised to aspirate. The ICD was repositioned after malposition, and intrapleural streptokinase was administered on two occasions. Despite being counselled on the risks, the patient requested removal of the ICD and pigtails and left against medical advice.

Comment: *A chronic, organised thoracic collection requiring drain revision and intrapleural fibrinolytic therapy.*

Case 11 — Man, 50 Years — First Admission, 2018
Diagnosis: Liver abscess with rupture into the right pleural cavity.

One week of abdominal pain and fever. Hb 9.4 g/dL, sodium 130.9 mmol/L, INR 1.24. Admission ultrasound showed a very large ruptured abscess in segments VI–VII (approximately 700 cc) extending through ill-defined rents into the right pleural cavity, with about 650 cc of pleural fluid and compression of the right hepatic vein. A Malecot catheter was placed in the liver and an ICD inserted under ultrasound guidance. He was discharged in stable condition with the Malecot catheter still in place.

Comment: *Outright hepatopleural rupture arising from a large right-lobe abscess.*

Comment: *Protracted hepatopleural disease with an organised hydropneumothorax and MDR Pseudomonas infection, needing sustained source control and antibiotic escalation.*

3. Cross-case Complication Analysis
Complications across the series fall broadly into four categories: rupture with local spread, thoracic complications, systemic or vascular complications, and associated bowel pathology.

Table 2. Summary of Complications Documented Across the 15 Clinical Episodes.

Complication	Cases	Comment
Thoracic extension	6/15	Encompassing pleural collections, empyema, chest-wall collection and intrathoracic rupture.
Rupture	6/15	Recorded as intraperitoneal, subcapsular or intrathoracic.
Peritonitis / intraperitoneal soiling	3/15	Generally accompanying collections that reached the capsular surface or subcapsular space.
Empyema/ organised pleural collection	≥4/15	Several required ICD placement, fibrinolysis or extended thoracic drainage.
Bowel inflammation / ileocolitis / appendix	5/15	Different cases involved the terminal ileum, ileocecal region, caecum/ascending colon or appendix.
Hepatic-vein thrombosis	2/15	Seen in the two most extensively ruptured abdominal cases with venous involvement.
Pulmonary thromboembolism	1/15	Occurred in the pregnant patient with HIV reactivity and raised D-dimer/FDP.
Hemodynamic instability	1/15	The 55-year-old with hypotension, acute kidney injury and severe uncontrolled diabetes.
MDR infection	1/15	Repeated pleural and purulent cultures grew MDR Pseudomonas aeruginosa.

4. Radiological Pattern

A recurring imaging feature was an abscess reaching the liver surface. Among the more complicated cases, this surface involvement tended to progress first to a subcapsular collection and then to extension into the pleural or peritoneal space. This progression was especially clear in the 24-year-old and 50-year-old patients with intrathoracic rupture, and in the 70-year-old with subcapsular rupture and hepatic-vein thrombosis. The 24-year-old's imaging captured the full range of possible spread: disease in both lobes, subcapsular collections, a tract toward the right paracolic gutter, peritoneal thickening, a subdiaphragmatic abscess, and communication with the right pleural cavity. Serial ultrasound also identified residual unliquefied cavities and a post-procedural echogenic area raising concern for hemorrhage. These findings help explain why repeated image-guided procedures were needed rather than a single drainage session.

In the prolonged 2026 thoracic case, serial chest films tracked a persistent air-fluid level and hydropneumothorax over several weeks, despite an indwelling ICD and hepatic catheter. This pattern points to a chronic, organised thoracic process rather than a simple reactive pleural effusion.

5. Laboratory Findings and Clinical Severity
Laboratory values varied widely across the cohort. Some patients had near-normal white-cell counts despite sizeable abscesses, whereas the hypotensive patient recorded a TLC of 24,500/ mm^3 and creatinine of 2.4 mg/dL. Anemia recurred among the more complicated cases: Hb measured 7.3 g/dL in the patient with appendicitis-associated abscess, 8.0 g/dL in the patient with subcapsular rupture, 8.3 g/dL in the chronic thoracic case, and 9.4 g/dL in the first hepatopleural episode from 2018.

Liver enzymes did not track disease severity in any consistent way. The 24-year-old with extensive bilateral rupture had an ALT of only 25.2 U/L, showing that substantial hepatic suppuration can occur without marked transaminase elevation. This suggests imaging and overall clinical status are more reliable severity indicators than transaminase levels alone.

Low serum albumin was specifically noted in the first hepatopleural episode, where medical review flagged hypoalbuminemia and intravenous albumin was administered. In a separate ruptured case, ascitic-fluid analysis showed low albumin with elevated LDH, consistent with peritonitis.

6. Treatment and Source Control
Most admissions began with broad-spectrum antibiotics, typically a third-generation cephalosporin paired with metronidazole. Aminoglycosides, fluoroquinolones, piperacillin-tazobactam and carbapenems were reserved for select cases, with escalation most evident among patients who were hemodynamically unstable or who developed prolonged hospital-acquired infection.

Percutaneous drainage served as the primary means of source control. Depending on anatomical location, this took the form of pigtail or Malecot catheters, repeated drainage across different hepatic segments, and right-sided intercostal drain (ICD) placement for thoracic collections. In the pregnant patient, pigtail drainage was followed by image-guided aspiration of a residual cavity. In the chronic thoracic case, the collection had organised beyond the point of aspiration and required intrapleural streptokinase.

A recurring practical constraint across the series was incomplete treatment: several patients with residual collections or drains still in place chose to leave against medical advice or by request. In such instances, "clinically stable" at discharge reflects the patient's condition at that moment and should not be equated with radiological cure.

7. Outcome Analysis
No deaths appear in the discharge records reviewed for this series, though this finding warrants caution. Several patients departed against medical advice while drainage, antibiotics or ongoing monitoring werestill required, and a number of the more prolonged cases still had residual abscesses on their

last recorded ultrasound. The available data cannot speak to recurrence, delayed mortality, outpatient adherence, or later readmission.

Discharge documentation routinely described patients as "vitally stable," even where substantial residual pathology remained. For this study, clinical stability at discharge was therefore treated as distinct from either completed treatment or radiological resolution.

8. DISCUSSION

The dominant impression from this series is how often complications extended beyond the liver itself among patients referred for surgical care. Six of the fifteen episodes involved the thorax, and an equal number showed clear evidence of rupture. Thoracic findings ranged from a modest right pleural collection through to outright hepatopleural rupture, empyema necessitans, and a prolonged organised hydropneumothorax.

A right-sided predominance is anatomically unsurprising, since most collections sat in segments VI and VII, close to the hepatic surface bordering the diaphragm. Once a posterior right-lobe collection breaches the capsule, the diaphragm offers a direct conduit into the pleural space.

Here, this pathway coincided with lung collapse or consolidation, loculated pleural fluid, and the eventual need for ICD drainage.

Peritoneal involvement was likewise clinically significant. In the ruptured cases, CT revealed subcapsular collections, free intraperitoneal fluid, peritoneal thickening and secondary bowel inflammation. At that point the disease was no longer confined to the liver, and management had to address source control across more than one body compartment.

The two instances of hepatic-vein thrombosis are noteworthy, occurring adjacent to the abscess cavity amid substantial local inflammation and rupture. While this series cannot establish causation, venous thrombosis is an already-recognised adverse feature of pyogenic liver abscess with implications for both prognosis and management.

Microbiological data were sparse across most of the cohort, with the majority of charts showing either no growth or no culture performed at all. The prolonged thoracic case stood apart, with repeated cultures confirming MDR Pseudomonas aeruginosa resistant to multiple anti-pseudomonal agents, prompting infectious-disease involvement. This case underscores the value of repeat sampling in prolonged, drain-dependent infections, particularly after earlier antibiotic courses and repeated procedures.

That no deaths were recorded should not be taken as a sign of mild disease. A number of patients left against medical advice, or by request, while collections or drains remained in place. Prior work has linked adverse outcomes to shock, renal dysfunction, anemia, hypoalbuminemia, hyperbilirubinemia, gas-forming infection, bacteremia, multidrug resistance and elevated APACHE II scores [4–8].

9. Comparison with Published Literature

Existing retrospective work points consistently to systemic illness severity, along with specific radiological and microbiological markers, as drivers of outcome. A cohort of 302 patients linked portal thrombosis, multidrug-resistant organisms and comorbidity burden to higher mortality, while drainage correlated withimproved survival [1]. A European observational study found pleural effusion among the most frequent complications, with sepsis or septic shock standing out as the strongest independent predictor of death [2]. An Indian study of 100 patients recorded complications in 24% of cases and flagged prolonged alcohol use, INR above 1.7, TLC above 20,000/mm^3 and pleural effusion as significant predictors [3].

This series shows a notably higher share of pleural complications than those broader hospital or community cohorts — most plausibly a reflection of referral bias into a surgical unit rather than a true difference in underlying incidence.

A recent systematic review and meta-analysis pooling 57 studies and 126,056 patients identified septic shock, chronic kidney disease, gas-forming infection, metastatic spread, anemia, thrombocytopenia, hypoalbuminemia, hyperbilirubinemia, renal impairment, bacteremia, drug resistance, pneumonia and ICU admission as significant mortality predictors. Percutaneous drainage was linked to lower short-term mortality in selected patients, though the authors cautioned against reading this as a causal relationship [8

A large Indian cohort of 1,630 adults similarly found that larger abscesses were more prone to rupture, that pyogenic abscesses carried more local complications, and that percutaneous intervention was the dominant treatment approach; jaundice, cirrhosis and septic encephalopathy independently predicted mortality [9].

These findings reinforce the present series' emphasis on early imaging to define extrahepatic spread and on securing adequate source control.

10. Strengths of the Present Series

- Every included case carried a confirmed liver-abscess diagnosis backed by detailed imaging.
- The cohort captures several complicated disease patterns, most notably hepatopleural and peritoneal rupture.
- Serial imaging and procedure notes in several cases allow the evolution of individual collections to be traced over time.
- The series includes a well-documented MDR Pseudomonas case and a pregnancy-associated thromboembolic event, both microbiologically or clinically instructive.

11. LIMITATIONS

- With only 15 cases, the sample is too small to support reliable inferential statistics or multivariable modelling.
- As a surgical-unit case series, the cohort carries inherent selection bias toward more complicated disease.
- Microbiological workup was incomplete in many admissions, limiting definitive etiological classification.
- Long-term outcomes are poorly captured, particularly for patients who left against medical advice or by request.
- Several charts lack complete baseline values for albumin, bilirubin, CRP, lactate and HbA1c.
- Because treatment varied with clinical circumstance and evolving hospital practice over several years, comparisons between regimens cannot be treated as controlled comparisons.
- One patient contributes two separate 2018 admissions, counted here as distinct episodes rather than as a single individual.

12. CONCLUSION

This 15 surgical cases shows that the most challenging presentations of liver abscess are defined by disease extending beyond the liver itself. Thoracic rupture, pleural empyema, intraperitoneal rupture, peritonitis, subcapsular collections, hepatic-vein thrombosis and secondary bowel inflammation recurred throughout the cohort. Image-guided drainage was the mainstay of source control, frequently requiring more than one catheter or a combined hepatic-and-thoracic approach.

The series also highlights a meaningful gap between apparent clinical stability and definitive treatment. Several patients were discharged with residual collections or drains

still in place, most often because they chose to leave against medical advice or by request. This body of work is therefore best read as a description of complicated liver abscess and its surgical management, rather than as a study of mortality..

Data source note:

every patient-level finding in this manuscript was drawn from the supplied discharge cards and investigation/procedure records. Where a variable went unrecorded, no value was imputed. The two 2018 admissions belonging to the same individual were kept as separate clinical episodes because each represented a distinct hospital stay.

Declared conflicts of interest: none.
External funding: none.
Ethical basis: retrospective analysis of pre-existing discharge documentation.
Design: retrospective, descriptive, single-centre case series compiled from discharge summaries.

13. REFERENCES

(Vancouver style — numbered in order of citation in text)

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