

## Role of surgery in management of liver abscess

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### Abstract

**Introduction:** Liver abscess is a common disease in developing world. Its treatment has evolved in last few years to become less and less invasive. Percutaneous drainage of liver abscess is a well-established method and probably most widely accepted as well. However, large and multiloculated abscess containing thick pus may not be suitable for such methods.

**Methods:** All patients with liver abscess, who could not be drained or not found suitable for percutaneous drain insertion and eventually underwent surgery were included in the study.

**Results:** Total 8 patients were treated by surgical drainage, open or laparoscopic technique. Surgical drainage was effective way of treatment for abscesses not treatable by needle aspiration or percutaneous tube drain insertion with good outcome.

**Conclusion:** In patient of liver abscess who has large multiloculated abscess with thick pus or not suitable for percutaneous drainage, surgical treatment either laparoscopic or open can be an effective and successful.

**Keywords:** Abscess; liver; percutaneous.

### Introduction

Liver abscess management has come a long way to today's rare fatality state from once universally fatal condition. The seminal work of Ochsner published on 1938 paved the modern and effective way of treating liver abscess.<sup>1</sup> However, controversies still surround regarding when and how a particular lesion has to be addressed for an optimal and rapid recovery.

Pyogenic abscesses account for almost 80% of all liver abscesses in the developed world and are often polymicrobial.<sup>2</sup> Amoebic and fungal abscesses are less common, and predominantly occur in Southeast Asia and Africa. Though relatively rare, with a reported incidence of 0.5-0.8% in the Western world and a frequency of 20 per 100,000 admissions in hospitalized patients, pyogenic hepatic abscesses are potentially lethal.<sup>3</sup> Etiology of liver abscess has changed over the last few decades. Historically, the commonest cause had been acute appendicitis but, with evolution and advancement of surgical practice and antimicrobial therapy over time, its' frequency as the primary source of abscess has decreased.<sup>4</sup> In contrast, the increasing frequency of cholelithiasis and biliary tract pathology, with their potential to incite ascending portal sepsis, have replaced appendicitis as the leading cause

of hepatic abscess.<sup>3,5,6</sup> Treatment of liver abscess has also evolved significantly. Percutaneous drainage (PD) is the most commonly done procedure for liver abscess, however not all abscesses are amenable to PD and surgical drainage (SD) is necessary at times. Thick viscous pus with debris is not suitable for PD. Septated internal cavity is also a barrier for complete and effective PD.

### Methods

Patients with abscess size more than 5 cm and who underwent surgical drainage as a first line treatment or after failed needle aspirations were included in this study. Patients with large liver abscess not treatable with needle aspiration were either referred to other hospitals or counseled to undergo surgical drainage of liver abscess. So, all large abscesses not amenable to conservative treatment and needle aspiration were planned for SD.

Patients were evaluated for time to improvement in symptoms after treatment, post-procedure pain and hospital stay, improvement of symptoms and length of antibiotic treatment. Pre-operative contrast enhanced CT was done in all patients for evaluation. Smaller abscesses treated by needle aspiration or PCD and amoebic abscesses were not included in the analysis.

All abscess cavities were drained with tube drain at completion of surgery and one drain was kept in the subhepatic space. Drain was removed once it stopped to drain for 2 consecutive days and ultrasound did not detect significant amount of fluid within the abscess cavity. Antibiotic was given to all patients for minimum of two weeks, intravenously for first 5 days.

## Results

Total 8 patients were treated surgically. Six patients initially underwent ultrasound guided needle aspiration using an 18 gauge spinal needle. Two patients were surgically drained without any attempt to PCD or needle aspiration. All six patients who underwent needle aspirations were either failed PCD or not considered for PCD tube insertion because of difficult access. In One PCD tube insertion resulted in devastating duodenal perforation and a pyloric exclusion surgery eventually needed along with open surgical drainage of liver abscess.

All patients had abscess size 5.8 cm and bigger, minimum attempt to aspirate in each patient was 3 (up to 4 attempts). Patients were on antibiotics while being treated by needle aspirations. Aspiration and PCD tube insertion was done under local anesthesia. Purulent content was noted in 2 patients, in 4 patients the aspiration revealed non-purulent content. Patients without purulent aspiration content were also planned for SD, as the radiological and clinical findings were compelling. Only 1 out of 6 patients had positive culture report (*E. coli*). (Table 1)

**Table 1:**

Variables	Number
Total no. of patients	8
Purulent aspirate	2
Non purulent aspirate	4
Culture positivity	1
Mean size (cm, as per CECT findings)	8.16 (SD 1.95)
Indication for surgery	
Multiple septations	2
Failure to insert PCD	1
Complication of PCD	1
Difficult location	4

Aspiration and PCD tube insertion was done by team of radiologists including consultants and residents. Two patients were planned for surgery without preceding PCD and needle aspiration due to presence of multiple abscesses with septations.

Laparoscopic drainage was attempted in 6 cases, but completed in 5 patients; one patient had to be converted to open surgery due to bleeding from liver. Laparoscopic drainage were done by using; 1 umbilical 10 mm camera port, 1 right subchondral and epigastric 10 mm ports were used. Port sites were used for the post-operative drain tube placement. Three patients were drained by open surgery, including one patient with duodenal injury following PCD attempt. Five patients had bile leak after surgery (All three patients after open surgical drainage, two patients after laparoscopic drainage) which stopped spontaneously in subsequent post-operative days. Average duration of tube drainage after surgery was 5.3 days (4-8 days).

Post - operative pain (using verbal numerical scoring, VNS) was significantly better in the laparoscopic group than open surgery group. Improvement of symptoms was remarkable from the second post-operative day. All patients after surgery were given antibiotics for 2 weeks and then ultrasound of abdomen was done to assess the resolution of the abscess. If USG showed remaining debris or collection within the abscess cavity, antibiotics were continued. Four patients in laparoscopic group required antibiotic for more than two weeks and two in open group required antibiotics for more than 2 weeks.

## Discussion

Antibiotic as a sole therapy can be used for small (<3 cm) multiple abscess.<sup>7,8</sup> Recommended duration of antibiotic therapy is variable, 2-4 weeks. Antibiotic is usually given parenteral way and continued until clinical improvement is documented. Parenteral antibiotic is changed to oral and continued for few more weeks. Broad spectrum antibiotic with gram positive and gram negative coverage is most commonly used.

Most of our patients presented after more than two weeks of onset of symptoms. Delay in presentation may lead to formation of more viscous pus and septations which might compromise the effectiveness of PCD and needle aspiration. Also a difficult location of abscess can be a challenge to the radiologist for PCD insertion.

Repeated needle aspiration is needed in most of the patients for successful treatment. A study done by Rajak CL showed

that percutaneous catheter drainage is more effective than needle aspiration in the treatment of liver abscesses. Needle aspiration, if limited to two attempts, has a high failure rate.<sup>9</sup> A study conducted by S Singh also found in group of 60 patients that, Percutaneous catheter drainage is a better modality as compared to percutaneous needle aspiration especially in larger abscesses which are partially liquefied or with thick pus.<sup>10</sup>

Drainage of large multiseptate liver abscesses may be more difficult to achieve percutaneously. In spite of the risk of a surgery and general anesthesia, there are several advantages that SD may have over PD. First, in our series, multiple abscesses and septations were found in most of the patients. The role of PD in case of multiloculated abscesses is not clear. Multiloculation contributes to poorer drainage by compartmentalization of the abscess, reducing the effectiveness of PD.<sup>11,12</sup> Abscesses with multiloculation could be easily drained by blunt finger dissection and completely evacuated. Flushing of the cavities after removal of pus was done in all patients to clear pus and debris. Also the abscesses were more effectively drained by a larger size tube inserted at the end of surgery.

We observed that post PD recovery of patients was not as rapid as in SD patients. Though pain score was higher in patients drained by open surgery, it was not an issue in laparoscopic patients and the feeling of well being after drainage of the septic cavity was more remarkable and prevailing. Both the patients who were planned for open surgery, an epidural catheter were inserted for the post-operative pain management.

## Conclusion

In our view, the surgical approach for drainage of liver abscess is a valid option for liver abscesses difficult to drain percutaneously and in situations when a large liver abscess cannot be drained percutaneously due to technical reasons. It highlights that SD does have a role in management of liver abscesses in difficult situations and it can result in clinical recovery comparable to PD.

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