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Multiple doctors, different recommendations for multiloculated pyogenic hepatic abscesses

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ABSTRACT A critical appraisal and clinical application of Hope WW, Vrochides DV, Newcomb WL, Mayo-Smith WW, Iannitti DA. Optimal treatment of hepatic abscess. *The American Surgeon*. 2008 Feb;74(2):178-82.¹ doi: [10.1016/j.jamcollsurg.2010.03.004](https://doi.org/10.1016/j.jamcollsurg.2010.03.004).

Keywords: *Pyogenic hepatic abscess, multiloculated, percutaneous drainage*

Clinical Context

A 62-year-old African American man with a history of untreated hepatitis C infection and recently diagnosed diabetes mellitus was transferred to our hospital for escalation of care for multiple loculated right hepatic lobe abscesses complicated by a right-sided pleural effusion. At an outside hospital, he initially presented with right upper quadrant pain and shortness of breath for 5 days. Computed tomography (CT) imaging had shown multiple right lobe multiloculated abscesses with the largest measuring 12 cm x 8.7 cm x 5 cm. It also showed an uniloculated moderate pleural effusion on the right side. Thoracentesis revealed a transudate with no organisms and no evidence of malignancy. Percutaneous drainage of several of the abscesses showed purulent fluid that grew *Streptococcus constellatus* and no evidence of malignancy. He was treated with intravenous (IV) metronidazole and ceftriaxone and was on day 14 when he arrived to our floor.

He had two percutaneous drains that had been placed in hepatic abscesses at the outside hospital that continued to drain a small amount of purulent material. Blood cultures taken on arrival showed no growth. Repeat CT imaging revealed multiloculated hepatic abscesses without drains, and reduction but not resolution of abscesses with drains. The team sought recommendations from hepatobiliary surgery, infectious disease, and interventional radiology. The team debated what the best approach would be. Because IV antibiotics had failed, it was decided that either percutaneous or surgical drainage would be necessary. However, it was uncertain whether percutaneous drainage would be sufficient. Despite this, the risks of open surgical drainage were also considerable, and we sought to explore the benefits of surgical versus percutaneous drainage.

Clinical Question

Is there a difference in the rate of recurrence of large multiloculated hepatic abscesses treated by percutaneous drainage versus surgical management?

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Research Article

Hope WW, Vrochides DV, Newcomb WL, Mayo-Smith WW, Iannitti DA. Optimal treatment of hepatic abscess. *The American Surgeon*. 2008 Feb;74(2):178-82.¹ doi: [10.1016/j.jamcollsurg.2010.03.004](https://doi.org/10.1016/j.jamcollsurg.2010.03.004).

Related Literature

Literature searches were done using the words “pyogenic, hepatic, abscess, percutaneous, and surgical” with and without the word “multiloculated” on PubMed, Web of Knowledge, and Google Scholar. There were few differences between the search results among the different engines. Results were filtered to exclude case reports and review papers, and 113 search results were found. Many studies indicated the benefits of percutaneous drainage versus needle aspiration for larger abscesses including a prospective randomized control study.²⁻⁴ A review of US data by Levin et al showed a significant decline in surgical management of hepatic abscesses and an increase in percutaneous drainage.⁵ No randomized controlled studies were found examining percutaneous versus surgical drainage. Five retrospective comparative studies were found evaluating drainage interventions for management of complicated hepatic abscesses.⁶⁻¹¹ These were reviewed as being the highest-level evidence available. The most relevant studies are described below.

A study by Bertel et al. in 1986⁶ retrospectively reviewed the treatment of 39 patients with hepatic abscesses, 30% with single abscesses and 57% with multiple abscesses. Morbidity was higher with percutaneous methods versus surgical methods (69% percutaneous vs 48% surgical), but mortality was comparable (13% percutaneous vs 17% surgical). This study was not selected for this critical appraisal because abscess loculation was not defined.

A study by Ferraioli et al. in 2008⁸ retrospectively compared the outcomes of 148 patients at two hospitals in Naples, Italy with hepatic abscesses (83 solitary and 21 multiple) treated with needle aspiration, catheter drainage, or surgical management. This study was also not selected because abscess loculation was not defined and the population was not appropriate for the patient in question.

A study by Tan et al. in 2005¹⁰ retrospectively compared the outcomes of 80 patients with hepatic abscesses larger than 5 cm in size. 80% of these had multiloculated abscesses. They compared the rate of treatment failures in patients treated with percutaneous versus surgical drainage. Results of the study were significant for fewer treatment failures in the surgical drainage group compared the percutaneous group. However, they pointed out that there was no significant difference in the morbidity or mortality rates between the two groups. This retrospective study was not chosen for appraisal due to the lack of examination of multiloculated abscess results versus uniloculated.

A study by Liu et al. in 2009¹¹ retrospectively examined 149 patients with hepatic abscesses. They compared rates of symptomatic improvement in patients divided into the following groups: 1) single uniloculated abscess, 2) single multiloculated abscesses, and 3) multiple multiloculated abscesses. Results of the study showed improvement in 88-90% of patients with no significant difference in outcomes between percutaneous drainage of single multiloculated and multiple multiloculated groups. This retrospective study was not chosen for appraisal due to a lack of comparison of outcomes to surgical intervention.

A study by Hope et al. in 2008¹ retrospectively examined 107 patients at a single US hospital with hepatic abscesses with comparisons of percutaneous drainage to surgical management in patients with large abscesses that were both uniloculated and multiloculated. This paper was selected for appraisal because of its size, appropriate population, and relevance to the questions of management in this case. Outcomes followed were rate of recurrence and resolution of symptomatology.

Critical Appraisal

The study by Hope et al.¹ compared three interventions: A) antibiotic treatment alone, B) percutaneous drainage plus antibiotics, and C) primary surgical therapy. They compared rates of abscess recurrence by CT or ultrasound evaluation in patients divided into the following groups: 1) less than 3cm abscesses; 2) larger than 3cm unilocular abscesses; 3) larger than 3cm multilocular abscesses. Regarding methodology, the retrospective nature of this study makes it SORT level 3 evidence. The 107 patients were seen at Rhode Island Hospital between 1995 and 2002, possibly limiting generalizability. Causes of hepatic abscesses were not reported, and as a

result it is possible that a non-American population exposed to different causes of hepatic abscess would not behave similarly. No analysis of the homogeneity of the study population was performed, preventing a rigorous analysis for potential confounding factors. Patients were separated into the groups previously described by evaluation of CT findings. Regarding study groups, A1 had 8 patients, B2 had 48 patients, B3 had 24 patients, and C3 had 27 patients. These relatively small numbers of patients and their uneven distribution into the study groups could call into question the predictive strength of this study. As this was a retrospective study, there was no randomization process. The follow up duration for defining abscess recurrence was not stated, opening the door for different follow up times confounding the results of this study. Despite some methodological limitations, this study stands as the strongest quality evidence found comparing surgical to percutaneous intervention in large multiloculated abscesses such as the ones in the patient in question.

The results of this study indicated a significantly improved recurrence-free disease for surgical therapy versus antibiotics alone and antibiotics plus percutaneous drainage. 27 of 27 (100%) of those in the C3 group (i.e. multiloculated abscesses >3 cm, surgery) did not recur. Only 8 of 24 (33%) of those in the B3 group (multiloculated abscesses >3cm, percutaneous drainage) did not recur. There was a statistically significant difference in outcomes between the percutaneous intervention and the surgical intervention in the group with large multiloculated hepatic abscess (reported $P < 0.0001$). This evidence seems to suggest that for large multiloculated hepatic abscesses surgical intervention results in far lower rates of recurrence.

The mortality rate in the percutaneous group was 4.2% and the surgical group 7.4%, and not significantly different between the two groups (reported $P = 0.40$). The Tan et al. study also had no significant difference in mortality¹⁰, and it is interesting to note that the appraised study showed no difference in mortality despite statistically significant differences in abscess recurrence. It is likely in this retrospective study that individuals that had recurrent abscesses after percutaneous drainage returned for treatment. The similar mortality between the groups may be an artifact of repeat treatment (possibly surgical or repeat percutaneous) occurring after the primary metric of the study was observed (abscess recurrence). Unfortunately details on the evaluation of mortality (such as survival time) were not offered by the study and cannot be satisfactorily examined. In lieu of this, the mortality results of this study should be looked at as far less rigorous and not used to guide therapy.

Clinical Application

In the case of our patient with the multiloculated hepatic abscesses, the infectious disease service stated that drainage of the abscesses was necessary. We continued antibiotic coverage with metronidazole and ceftriaxone while awaiting intervention. The surgical service recommended not to pursue surgery and that percutaneous drainage be performed by interventional radiology. Interventional radiology attempted CT-guided placement of an additional percutaneous drain, but upon placement aspiration only drew back frank bloody fluid and drain placement was aborted. They recommended against further drain placement attempts, as they did not see a clear window for drain placement. Throughout the duration, serial CT imaging showed unchanging hepatic abscesses, blood cultures continued to come back without growth, and the patient remained asymptomatic and stable. Faced with the evidence presented in the Hope et al. study, and in the context of the failure of IV antibiotics and multiple percutaneous drains, our team decided that surgical treatment was necessary.

Many of our patients face an experience similar to this patient: multiple doctors giving different recommendations. Clinical judgment and clinical evidence both contributed to our clinical decision-making. What seems contradictory and uncertain to doctors caring for this patient must seem bewildering to the patient. The decision by our team was only the start of a treatment plan. We next had to implement that decision within a social context of consultants, clinical evidence, and patient understanding and agency.

Take-home points:

1. Doctors must face the task of integrating clinical experience, clinical evidence, and organizational structure even when these elements of clinical care conflict with each other.
2. For large uniloculated hepatic abscesses, percutaneous drainage is frequently successful and surgical intervention should not be first-line.

3. For large, multiloculated hepatic abscesses, surgical drainage may be superior to percutaneous drainage in preventing recurrence. However, there may not be a significant difference in mortality between these two procedures.

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