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Article*

Percutaneous drainage may not be necessary in a significant subset of patients with complicated liver abscess

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ABSTRACT

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Background: Clinical features and outcomes of liver abscess are ever changing, even in South Asia, where parasitic infections are common. It is important to devise management strategies to suit the changing needs. We wanted to capture this emerging spectrum in “real life” through assessment of clinical features, management strategies and outcomes of a cohort of treated liver abscess patients at a single center.

Methods: A retrospective study of patients admitted to a referral institution between February 2010 and June 2014 was undertaken. Patients with liver abscess who have received prior treatment in another hospital, and have then been referred for a complicated disease course were studied; their demographics, clinical presentations, evolution and outcomes were analyzed.

Results: A total of 154 patients [males 109, 70.78%), mean age 43.71 ± 16.49 years] were included in this study. Alcohol use was the most common (23.38%) predisposing factor, followed by biliary obstruction (20.78%) and diabetes (11.04%). Most common presenting features were fever, pain abdomen and jaundice [92.9%, 86.4% and 20.8% patients respectively]. Majority of patients (58.4%) had a solitary liver abscess; right lobe being the commonest site (61%). Median abscess volume was 180 ml (Range 7-1524 mL); abscess rupture occurred in 21 (13.6%) cases, most commonly in subdiaphragmatic location. Overall, abscess drainage was required in 97 (63%) patients [single time aspiration 15 (15.5%), percutaneous indwelling catheter 80 (82.8%), surgical drainage 2 (2.1%)]. Patients who required percutaneous drainage were mostly males, had higher abscess volumes and were more frequently alcohol users and diabetics. Six (3.9%) patients died in the study period.

Conclusion: While large abscess, alcoholism and diabetes were associated with increased need for catheter drainage, 37% can be treated by drug therapy alone. Careful selection of subjects for drainage may help in decreasing the mortality rate in this benign condition.

KEYWORDS: Liver abscess; percutaneous drainage.

Introduction

Liver abscess refers to an infected space-occupying lesion in the hepatic parenchyma. It remains an important clinical problem with a significant mortality rate in both developing and developed countries. It could result as a complication of various intraabdominal infections including that of biliary tract; by hematogenous spread via portal vein from the gastrointestinal tract; or, may develop after traumatic injury to the liver. The two most common types of liver abscesses are pyogenic and amoebic. Pyogenic liver abscess has a reported incidence of 20 per 1,00,000 hospital admissions in a western population.¹ Ascending biliary tract infection because of extrahepatic biliary obstruction is the most commonly identifiable cause of pyogenic liver abscess. Biliary obstruction in this setting may be in the form of malignant diseases, as in Western countries, or may be due to predominantly gallstone disease and hepatolithiasis in Asia.^{1,2} Amoebic liver abscesses are mostly seen in tropical countries where *Entamoeba histolytica* is endemic and is more prevalent in individuals with defective cell mediated immunity.³ Clinical presentations of amoebic and pyogenic liver abscesses share many similarities and can confound the clinician.⁴ The standard treatment of liver abscess is the use of appropriate antibiotics and supportive care. Recent literature on percutaneous drainage procedure have shown a favorable outcome with less average length of stay in hospital compared to conservative mode of treatment.⁵ The aim of this present study was to evaluate the clinical profile and scenario in which liver abscess occurs, the role of percutaneous drainage in management of liver abscess and outcomes in these patients.

Methods

This study was undertaken at School of Digestive & Liver Diseases, IPGME & R, Kolkata, a referral Gastroenterology and Hepatology center in eastern India. A retrospective record review of patients admitted between February 2010 and June 2014 was undertaken to identify patients who had been admitted with the diagnosis of liver abscess. Data pertaining to demographics (age,

sex), clinical presentations (duration of symptoms, presence of fever/pain abdomen/jaundice/shortness of breath/abdominal swelling), past history (risk factors for liver abscess, alcohol use, chronic diseases like diabetes, prior history of liver abscess) blood biochemistry and hematology data (liver function test, hemoglobin, total leucocyte count, platelet count, creatinine), radiological findings (number, location and total volume of abscess(es), presence of abscess rupture and its site), microbiological findings (Gram stain findings, growth on culture, antibiotic sensitivity), medications used (fluoroquinolones and/or metronidazole), drainage procedures performed (single time aspiration versus pigtail catheter drainage- number, size of pigtail catheter(s) used, duration of pigtail drainage) and outcomes (duration of stay, recovery, requirement of surgery, death) during hospital stay, were retrieved from electronic medical record database. These were reviewed with respect to completeness and transferred to a predesigned Microsoft Office Excel worksheet. Measures were taken to maintain privacy and confidentiality of patient data by anonymization. Final data sheet was subjected to analysis by statistical software Epi Info 7 (Centre for Disease Control, Atlanta, USA). Descriptive statistical terms like percentage, ratio and proportion were used for categorical variables, and mean, median, standard deviation and percentiles were used for quantitative analysis. The research protocol was approved by the institutional review board.

Results

A total of 177 patient records were retrieved from Electronic Medical Records responding to the search query for "liver abscess". Out of these, 18 records were incomplete or diagnosis could not be confirmed, and were not included in subsequent analysis. Four patients also had multiple admissions (3 admissions for 1 patient and 2 admissions for 3 patients) and were considered as a single admission. The remaining 154 patient recorded were considered for inclusion in this study and for further analysis.

Demographics and risk factors

The average age of patients admitted with liver abscess in our study was 43.7±16.5 years, while males comprised 70.8 % (n=109) of our study population. Possible risk factors identified were alcohol use in 36 (23.4 %) patients, biliary obstruction in 32 (20.8%) and diabetes in 17 (11%) patients. No risk factors could be attributed in 61 (39.6%) patients.

Clinical presentation

Mean duration of illness before admission was 24.8±22 days. The commonest presenting symptom was fever in 143 (92.86%) patients, followed by pain abdomen, jaundice, shortness of breath and abdominal swelling in 133 (86.36%), 32 (20.78%), 18 (11.69%) and 16 (10.39%) patients respectively. Five (3.29%) patients had a prior history of having suffered from liver abscess.

Laboratory data and radiological findings (Table 1)

Majority of patients (90, 58.44 %) had a solitary liver abscess; right lobe being the commonest location (94, 61.04 %). Median abscess volume was 180 ml (7-1524 mL); abscess rupture occurred in 21 (13.64%) cases, most commonly to subdiaphragmatic location (n=12, 57.1%).

Treatment received

One hundred and fourteen patients (74.03%) received treatment with fluoroquinolones while 107 (69.48%)

received metronidazole. Abscess drainage was required in 95 (61.69%) patients; 15 (9.74%) patients underwent ultrasound (US) guided single time aspiration while 80 (90.26%) patients required US guided placement of indwelling pigtail catheter in abscess cavity. The mean duration of indwelling catheter drainage required was 5.66±3.79 days. Requirement of percutaneous drainage was significantly associated with male gender, ethanol consumption, diabetes, higher abscess volume, and lower serum bilirubin values (Table 2). Surgical intervention was done in 2 (1.30%) patients. Mean duration of hospitalization was 8.06±4.73 days. Mortality rates among liver abscess patients stood at 3.9% (6/152) in this study.

Microbiological examination

Aspirated pus from liver abscess was sent for gram stain and culture in 35 patients; in 12 (34.29%) cases, causative organisms could be identified as *Klebsiella*, *E.coli* and *Pseudomonas* in 6, 5 and 1 cases respectively.

Subgroup: Pyogenic liver abscess

Of the 32 patients with pyogenic liver abscess, 12 (37.50%) were males and the average age at presentation was 45.59±14.71 years. These patients with pyogenic liver abscess were symptomatic for a mean duration of 23.56±18 days before presentation. The commonest presentations in this subgroup were fever, pain abdomen and jaundice, being present in 93.75%, 78.13% and 59.38% patients respectively. The most frequent among

Table 1: Depicting laboratory data and ultrasound findings for the study patients

Abscess number		Laboratory parameters	
One	90 (58.44%)	Serum bilirubin (mg/dL)	0.8 (0.1-34.3)
Two	26 (14.29%)	SGPT (IU/mL)	38 (10- 430)
Multiple	34 (27.27%)	SGOT (IU/mL)	51 (13-680)
Abscess location		ALP (U/L)	322 (34-1056)
Right lobe	94 (61.04 %)	Serum albumin (g/dL)	2.6 (1.5-4.1)
Left lobe	26 (16.88 %)	INR	1.33 (1-4.8)
Both lobes	34 (22.08 %)	Hemoglobin (gm/dL)	10.08 ± 2.05
Abscess volume (millilitre)	285.98 ± 280.03	Total leukocyte count (10 ³ /mL)	15.79 ± 8.12
Abscess ruptured	21 (13.64%)	Platelet count (10 ³ /mL)	274.35 ± 131.73

Table 2: Characteristics of patients with liver abscess classified according to requirement of percutaneous drainage

		Percutaneous drainage required		
		No (n=59)	Yes (n=95)	p value
Age (years) Mean \pm SD		44 \pm 18	44 \pm 16	0.58
Sex	Male	30 (50.85%)	79 (83.16%)	.0001
	Female	29 (49.15%)	16 (16.84%)	
Abscess Location	Right lobe	33 (55.93%)	61 (64.21%)	.159
	Left lobe	8 (13.56%)	18 (18.95%)	
	Both lobes	18 (30.51%)	16 (16.84%)	
Abscess volume (mL) Median, range		58 (7-525)	286 (70-1524)	.0001
Abscess rupture (n,%)		2 (3.51%)	19 (19.59%)	.004
Presence of risk factors	Ethanol	6 (10.17%)	29 (30.53%)	.018
	Biliary obstruction	25 (42.37%)	7 (7.37%)	
	Diabetes	4 (6.78%)	14 (14.73%)	
Total symptomatic period (days) Median, range		25 (9-162)	27 (9-110)	.330
Mortality (n,%)		0 (0%)	6 (6.32%)	.05
Serum bilirubin (mg/dl) Median, range		1.20 (.1-34.30)	0.72 (.5-18.50)	0.024
INR Median, range		1.34 (1-4.80)	1.32 (1-2.30)	.370

the causes of biliary obstruction were choledocholithiasis [15 (44.12%)], biliary malignancy [7 (20.59%)] and benign biliary stricture [4 (11.76%)], followed by recurrent pyogenic cholangitis [3 (8.82%)], hepaticojejunostomy stricture [2 (5.88%)] and 1 case (2.94%) each of biliary ascariasis, iatrogenic bile duct injury and combined choledocholithiasis with biliary malignancy.

Fifty percent (n=16) patients had multiple abscesses while 13 (40.63%) had a single abscess. The average abscess volume was 118.90 \pm 80.00 mL and rupture of abscess occurred in only 2 out of 32 cases. Seven out of 32 patients (21.88%) with pyogenic abscess required percutaneous drainage, with 3 patients undergoing in dwelling catheter insertion, 2 requiring single time percutaneous aspiration and 2 patients undergoing both modalities.

Discussion

Liver abscess is an important clinical problem in a tropical country like India. The two commonest types of liver abscess (pyogenic and amoebic) are difficult to differentiate clinically and require further investigations and/or invasive procedures to establish the diagnosis;

this is necessary as they have different modalities of treatment. Amoebic liver abscess have been reported more commonly at younger ages (40.5-43.64),^{6,7} while pyogenic liver abscess has been found to be more common at more than 60 years of age in Western population.^{8,9} The mean age of patients in our study (43.71 years) corroborates data from previous Indian studies,^{6,7} and is inconsistent with that reported in a similar retrospective study from the United Kingdom.¹⁰

Along with biliary obstruction, with respect to risk factors, cryptogenic mechanisms have been held responsible for most liver abscesses,^{10,11,12} In our study also, the underlying predisposing factor could not be identified in two fifths of cases. In a study from Hong Kong,¹³ ERCP findings in patients of pyogenic liver abscess revealed no abnormality in 38% cases and choledocholithiasis in 22% cases, while in our study, choledocholithiasis was present in 44% of patients with biliary abnormalities, followed by malignant biliary stricture in 21%.

In a study from India, pain abdomen, fever and anorexia have been reported by Ghosh et al to be the commonest (93-99%) presentation of liver abscess;¹⁴ this is also consistent with the findings of our study with fever present in 93% and pain abdomen in 86% patients.

They have also reported right lobe of liver to be the site of abscess in 71% cases, a figure slightly greater than our own (61%). Also, in our study, the incidence of rupture was found to be 13.64%, which is higher than previously reported frequency of 3%.¹⁵ This can be since we have studied patients who were referred to us for incomplete resolution of symptoms after initiation of treatment elsewhere.

Decision regarding percutaneous aspiration of pus is often contentious and requires assessment of clinical status in addition to imaging modalities. A recent randomized trial from India has revealed that in the management of uncomplicated, solitary, right lobe amoebic liver abscess of 5 to 10 cm, percutaneous needle aspiration along with metronidazole was no better than metronidazole alone with regards to duration of hospitalization, frequency of abscess rupture and resolution of pain and fever.¹⁶ Another recent study has underlined the better outcomes of using percutaneous catheter drainage over percutaneous needle aspiration in management of large (>10 cm diameter) amoebic liver abscesses.¹⁷ In our study, we identified that male patients and those with ethanol consumption, diabetes, higher abscess volume values were more likely to require percutaneous drainage of liver abscess. We also demonstrated that overall, abscess drainage was required in 97 (63%) patients, thus 37 % patients even with complicated disease course were treated by medical management alone.

Conclusion

This study demonstrated that while large abscess, alcoholism and diabetes were associated with increased need for catheter drainage, 37% could be treated by drug therapy alone. Careful selection of subjects for drainage might decrease the mortality rate in this benign condition.

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