

Management of Liver Abscess at Teaching Hospital

Shrestha SK,¹ Joshi R,¹ Dongol UMS,¹ Singh DR,¹ Sharma SK¹

¹Department of Surgery, Kathmandu Medical College Teaching Hospital, Sinamangal, Kathmandu, Nepal.

ABSTRACT

Background: A current assessment of liver abscesses should allow for better understanding of the pathogenesis of the disease and improve the effectiveness of diagnosis and treatment. Amoebic liver abscess occurs more commonly than the pyogenic liver abscess on a worldwide basis. The purpose of the study is to investigate the clinical presentation and management option for liver abscess.

Methods: A prospective observational study was conducted from January 2007 to December 2010, in Kathmandu Medical College Teaching Hospital. We recorded and analyzed the clinical presentations, diagnostic modalities, treatment programmes of all liver abscesses.

Results: Liver abscess was more common in males, 24(85.7%) males and 4(14.3%) females, occurring more frequently in right lobe of liver. Most patients presented with nonspecific clinical and biochemical features. Twenty (71.4%) patients presented with chills & rigors. Five patients (17.8%) presented jaundice and none had transaminases raised but 15(56.3%) had raised alkaline phosphatases. Eight (28.5%) patients were treated with antibiotics alone. USG guided drainage was done in 12(42.8%) patients and 6(21.4%) required surgical exploration with laparoscopic deroofing in 2(7.1%) patients. The largest size was 1100cc. with right lobe predominance in 20(76.9%) patients and single lobe involvement in 22(78.4%) patients. Six (21.4%) patients had multiple liver lobes involved. Three (7.1%) patients had ruptured liver abscess and 3(7.1%) had right sided pleural effusion. Seventeen (60.7%) patients were diagnosed have amoebic liver abscess. Ten (35.7%) patients were found to have pyogenic liver abscess. One (3.5%) had tuberculosis.

Conclusions: Liver abscess requires a high degree of suspicion for early diagnosis. When appropriate therapy in the form of antibiotics in combination with percutaneous drainage or surgery is administered the mortality is very low. However, significant morbidity is still a problem in old debilitated persons with other core morbidities.

Keywords: liver abscess, clinical features, percutaneous drainage and management.

INTRODUCTION

Liver abscess, a potentially life threatening disease, has undergone significant changes in epidemiology, management and mortality over the past decades.¹ Percutaneous drainage is widely accepted as a treatment of choice for Liver abscess, because of its minimal invasiveness and high cure rate.² In the past

20 years, the advent of modern diagnostic imaging techniques allow the precise location of the abscess and development of image guidance for drainage of abscess made mortality decrease to acceptable level.³⁻⁵ Availability of potent antibiotics drugs and advance intensive care also contributed to lower the mortality rate.

Correspondence: Dr. Suman Kumar Shrestha, Department of Surgery, Kathmandu Medical College Teaching Hospital, Sinamangal, Kathmandu, Nepal., Email: suman_shrestha@hotmail.com, Phone: 9851032851.

The treatment of amoebic liver abscess which are not secondarily infected consists of aspiration and the use of amoebicides and open operation should be employed only in those cases in which there is infection with pyogenic microorganisms.^{4,6} The low morbidity and high success rate in treating liver abscesses by percutaneous catheter drainage suggest that this therapy should be tried before operative intervention is considered.^{7,8}

METHODS

A prospective observational study was conducted from January 2007 to December 2010, in Department of Surgery, Kathmandu Medical College Teaching Hospital. We recorded and analyzed the clinical presentations, diagnostic modalities, treatment of all liver abscesses. The inclusion criteria for the study are patients aged 8-70 years of both genders and clinical and USG diagnosis of liver abscess. The ethical approval was taken. The exclusion criteria were previous abdominal and biliary surgeries, immunosuppression and abdominal neoplasia antecedents. The variables of age, sex, clinical features, laboratory data and USG investigations including number, size and location of abscesses are recorded. The factor studied also includes microbiologic data and type of treatment. The variable was analyzed with respect to the clinical course and mortality rate. Mortality is defined as death in 30 days after treatment or discharge from the hospital. The study population was sequential patients with clinical and the USG diagnosis of liver abscesses.

The diagnosis was made by clinical features, laboratory investigations and USG findings. Neither CT or radiographic isotope scanning or angiography was used. All patients were initially treated by conservative management. Broad spectrum antibiotics therapy had been initiated and was modified when sensitivity were demonstrated by bacterial cultures. Percutaneous drainage was performed for abscess size more than 3 cm after 3 days of conservative management. This was followed by placement of 14 French pigtail catheters by Sheldinger technique. If the patients' condition improved after conservative treatment or after percutaneous drainage of the abscess, the antibiotic is continued for 4 weeks. The patients who were unresponsive to conservative treatment or who have complications of rupture of abscess and peritonitis or difficulty in performing in percutaneous drainage were selected for operative drainage open or laparoscopic. The data entry was done in Excel 2007 and analysis was done in SPSS 11.5 version software. Data were analyzed by descriptive statistics that is mean, standard deviation and percentage.

RESULTS

Twenty eight patients with liver abscess were included in this study. The mean age was 35.36±12.72 (range 8-70yrs.) and 24(85.7%) of the patients were males. The most common clinical features were fever with chills,

right upper abdominal pain, and weight loss, 20(71.4%), 16(57.1%) and 12(42.8%) of the patients respectively. Clinically obvious jaundice was found in 5(17.8%) patients. Abdominal tenderness in the right hypochondrium was seen in 9(32.14%) patients. Total 2(7.1%) of the patients had ruptured liver abscess with peritonitis (Table 1). The main laboratory findings are shown in table 2. Chest x-rays demonstrated pleural effusion in 3(7.1%) patients. All liver abscesses in this series were identified and located by the ultrasonography.

Table 1. Clinical features.

Clinical features	No of patients (n-28)
Fever with chills	20 (71.4%)
Pain right hypochondrium	16(57.1%)
Weight loss	12(42.8)
jaundice	5(17.8%)
Liver rupture with peritonitis	3(7.1%)

Table 2. Laboratory finding.

	Single abscess	Multiple abscess	Total cases
Leucocytosis >11000/cumm	16	4	22(78.6%)
<11000/cumm	6	2	6(21.4%)
Alkaline phosphatase >279 IU/L	14	1	15(56.3%)
<279IU/L	10	3	13(46.4%)

Table 3. Management of liver abscess.

	Amoebic abscess	Pyogenic abscess	Tubercular abscess	Total cases
Conservative management	7	1	-	8(28%)
Percutaneous drainage	8	3	1	12(42.9%)
Laparoscopic drainage	1	1	-	2(7.1%)
Exploratory laparotomy	1	5	-	6(21.4%)

Table 4. Hospital stay in different management groups.

	Admission days	No of patients	Overall mean hospital days
Conservative management	5-11	8	9.32+ ₋ 4.635
Percutaneous drainage	4-12	12	
Laparoscopic drainage	5-6	2	
Exploratory laparotomy	6-21	6	

Table 5. Types of liver abscesses.

sex	Amoebic abscess	Pyogenic abscess	Tubercular abscess	total
male	15	8	1	24(85.7%)
female	2	2	-	4(14.3%)
Total	17(60.7%)	10(35.7%)	1(3.5%)	28(100%)

Table 6. Microbial agents for liver abscess.

organisms	No of patients
E. coli	6(21.4%)
Klebsiella pneumoniae	1(3.6%)
Proteus	1(3.6%)
polymicrobial	2(7.1%)
E. histolitica	17(60.7%)
Tuberculosis bacilli	1(3.6%)

There were 22(78.6%) single and 6(21.4%) multiple liver abscesses. The incidences of right, left and bilobar abscesses were 20(71.4%), 2(7.1%) and 6(21.4%) respectively. The abscesses ranged in size from 75 to 1100 ml with an average of 587.7 ml. Total 12(42.9%) of the 28 patients were subjected to ultrasound guided percutaneous drainage followed by pigtail stent placement and complimented with antibiotic therapy (Table 3). The hospital stay was 4-12 days. Six (21.4%) patients were treated by open surgical drainage with placement of the drain in abscess area. The hospital stay was 6-21 days. Two (7.1%) of the patients were treated by laparoscopic drainage and keeping a drain. The hospital stay in this group was 5-6 days. The remaining 8 (28%) patients of this study received antibiotic therapy alone with mean hospital stay of 5-11 days. The overall mean hospital stay was 9.32 ± 4.64 days ranged from 4-21 days (Table 4). There were 17(60.7%) amoebic liver abscesses, 10(35.7%) pyogenic liver abscesses and 1(3.5%) tubercular abscess (Table 5) E. coli (6, 21.4%) was the most common pathogen for pyogenic liver abscess and 17(60.7%) patients had amoebic liver abscess (Table 6).

DISCUSSION

In the present study, the most common symptoms were fever with chills, pain right upper quadrant and weight loss which are also seen similarly in other studies.^{1,9-14} A raised alkaline phosphatase level was most common biochemical abnormality in about two thirds of the patients.¹⁵⁻²¹ In this study it was raised in 15(56.3%) of 28 patients. Liver abscesses are more common in males and right lobe of the liver was involved in 95% of the cases. They are solitary in almost all cases.^{21,24} Twenty (71.4%) of 28 liver abscesses were in the right lobe in our series. The reason why right lobe is more affected may be possibly greater volume of blood goes to right side than to the left.

In general, antibiotics may be an alternative for patients whose disease is too critical to undergo invasive approaches for patients with small, multiple abscesses not amenable to drainage interventions. Several reports have suggested that inadequate empiric antibiotic therapy may result in increased failure rate and increased mortality rate.^{5,6} But in our series, the patients treated with antibiotics alone had an acceptable response with a lower rate of complications. Percutaneous drainage completely cured or shrunk abscess in 11 patients. Our experience and that of others emphasize that percutaneous drainage is as effective as open surgical drainage.^{2,3,8} Surgical drainage was only indicated in those patients who developed complications such as rupture and peritonitis or when the condition worsened and drainage tube failure.^{4,5,7} We explored 7 patients with open surgery and one by laparoscopically. Both the groups were discharged in 5-21 days.

Amoebic liver abscess is more prevalent and in most circumstances can be identified and managed without percutaneous drainage. However, an abscess with diameter bigger than 8 cm is associated with failure of medical treatment.^{23,25,26} but in our series, 8 out of 17 patients had to be drained because of larger sizes.

The most common pathogen of pyogenic liver abscess was E. coli in our series. The predominant cause of pyogenic liver abscess was also E.coli. in other studies.⁹⁻¹¹ In our series, only one case of abscess was caused by Klebsiella pneumoniae. There were no metastatic complications as mentioned in other literatures. K. pneumoniae is emerging as the cause of hepatic abscess in USA, Korea and Taiwan. It caused metastatic septic complication of lung, eye and central nervous system.^{1,11,13-18,20} We had found one case of tuberculous hepatic abscess which was treated by aspiration and antitubercular therapy. No tuberculous hepatic abscess was reported in literature.

Liver abscesses require a high index of suspicion of early for early diagnosis.

CONCLUSIONS

Ultrasonography guided percutaneous drainage for the intrahepatic abscess is the treatment of choice unless complicated by rupture of abscess and peritonitis when laparotomy is indicated. However significant morbidity is still a problem particularly in elderly.

REFERENCES

1. Rahimian J, Wilson T, Oram V, Holzman RS. Pyogenic liver abscess: recent trends in etiology and mortality. Clin Infect Dis. 2004 Dec 1;39(11):1654-9.

2. Sugiyama M, Atomi Y. Pyogenic hepatic abscess with biliary communication. *Am J Surg.* 2002 Feb;183(2):205-8.
3. Alvarez Pérez JA, González JJ, Baldonado RF, Sanz L, Carreño G, Junco A, Rodríguez JI, Martínez MD, Jorge JI. Clinical course, treatment, and multivariate analysis of risk factors for pyogenic liver abscess. *Am J Surg.* 2001 Feb;181(2):177-86.
4. Hsieh HF, Chen TW, Yu CY, Wang NC, Chu HC, Shih ML, Yu JC, Hsieh CB. Aggressive hepatic resection for patients with pyogenic liver abscess and APACHE II score $>$ or $=$ 15. *Am J Surg.* 2008 Sep;196(3):346-50.
5. Chen SC, Huang CC, Tsai SJ, Yen CH, Lin DB, Wang PH, Chen CC, Lee MC. Severity of disease as main predictor for mortality in patients with pyogenic liver abscess. *Am J Surg.* 2009 Aug;198(2):164-72.
6. Ochsner A, DeBakey M. Liver abscess part I: Amoebic abscess analysis of 73 cases. *The American Journal of Surgery* 1935;29:173-94.
7. Mandel SR, Boyd D, Jaques PF, Mandell V, Staab EV. Drainage of hepatic, intraabdominal, and mediastinal abscesses guided by computerized axial tomography. Successful alternative to open drainage. *Am J Surg.* 1983 Jan;145(1):120-5.
8. Gerzof SG, Johnson WC, Robbins AH, Nabseth DC. Intrahepatic pyogenic abscesses: treatment by percutaneous drainage. *Am J Surg.* 1985 Apr;149(4):487-94.
9. Chen SC, Yen CH, Lai KC, Tsao SM, Cheng KS, Chen CC, Lee MC, Chou MC. Pyogenic liver abscesses with *Escherichia coli*: etiology, clinical course, outcome, and prognostic factors. *Wien Klin Wochenschr.* 2005 Dec;117(23-24):809-15.
10. McDonald MI, Corey GR, Gallis HA, Durack DT. Single and multiple pyogenic liver abscesses. Natural history, diagnosis and treatment, with emphasis on percutaneous drainage. *Medicine (Baltimore).* 1984 Sep;63(5):291-302.
11. Yang PW, Lin HD, Wang LM. Pyogenic liver abscess associated with septic pulmonary embolism. *J Chin Med Assoc.* 2008 Sep;71(9):442-7.
12. Zibari GB, Maguire S, Aultman DF, McMillan RW, McDonald JC. Pyogenic liver abscess. *Surg Infect (Larchmt).* 2000;1(1):15-21.
13. Nah BK, Kim YS, Moon HS, Park KO, Kim SM, Lee YS, et al. Recent changes of organism and treatment in pyogenic liver abscess. *Taehan Kan Hakhoe Chi.* 2003 Dec;9(4):275-83.
14. Lederman ER, Crum NF. Pyogenic liver abscess with a focus on *Klebsiella pneumoniae* as a primary pathogen: an emerging disease with unique clinical characteristics. *Am J Gastroenterol.* 2005 Feb;100(2):322-31.
15. Fang CT, Lai SY, Yi WC, Hsueh PR, Liu KL, Chang SC. *Klebsiella pneumoniae* genotype K1: an emerging pathogen that causes septic ocular or central nervous system complications from pyogenic liver abscess. *Clin Infect Dis.* 2007 Aug 1;45(3):284-93.
16. Fung CP, Chang FY, Lee SC, Hu BS, Kuo BI, Liu CY, et al. A global emerging disease of *Klebsiella pneumoniae* liver abscess: is serotype K1 an important factor for complicated endophthalmitis? *Gut.* 2002 Mar;50(3):420-4.
17. Cheng HP, Chang FY, Fung CP, Siu LK. *Klebsiella pneumoniae* liver abscess in Taiwan is not caused by a clonal spread strain. *J Microbiol Immunol Infect.* 2002 Jun;35(2):85-8.
18. Chung DR, Lee HR, Lee SS, Kim SW, Chang HH, Jung SI, et al. Evidence for clonal dissemination of the serotype K1 *Klebsiella pneumoniae* strain causing invasive liver abscesses in Korea. *J Clin Microbiol.* 2008 Dec;46(12):4061-3.
19. Han SH. Review of hepatic abscess from *Klebsiella pneumoniae*. An association with diabetes mellitus and septic endophthalmitis. *West J Med.* 1995 Mar;162(3):220-4.
20. Cobo Martínez F, Aliaga Martínez L, Díaz Monllor F, Mediavilla García JD, Arrebola Nacle JP, de la Rosa Fraile M. Liver abscess caused by *Klebsiella pneumoniae* in diabetic patients. *Rev Clin Esp.* 1999 Aug;199(8):517-9.
21. Liew KV, Lau TC, Ho CH, Cheng TK, Ong YS, Chia SC, et al. Pyogenic liver abscess--a tropical centre's experience in management with review of current literature. *Singapore Med J.* 2000 Oct;41(10):489-92.
22. Corbella X, Vadillo M, Torras J, Pujol M, Rafecas A, Gudiol F. Presentation, diagnosis and treatment of pyogenic liver abscess: analysis of a series of 63 cases. *Enferm Infecc Microbiol Clin.* 1995 Feb;13(2):80-4.
23. Conter RL, Pitt HA, Tompkins RK, Longmire WP Jr. Differentiation of pyogenic from amoebic hepatic abscesses. *Surg Gynecol Obstet.* 1986 Feb;162(2):114-20.
24. Zibari GB, Maguire S, Aultman DF, McMillan RW, McDonald JC. Pyogenic liver abscess. *Surg Infect (Larchmt).* 2000;1(1):15-21.
25. Lodhi S, Sarwari AR, Muzammil M, Salam A, Smego RA. Features distinguishing amoebic from pyogenic liver abscess: a review of 577 adult cases. *Trop Med Int Health.* 2004 Jun;9(6):718-23.
26. Graillet R, Sánchez-Aguilar M, Morán-Mendoza AO, Hernández-Sierra JF, Gordillo-Moscoso A, Tapia-Pérez JH. Analysis of factors associated to failure of medical treatment of amoebic liver abscess. *Cir Esp.* 2008 Aug;84(2):83-6.