



A CLINICO PATHOLOGICAL STUDY AND MANAGEMENT OF RUPTURED LIVER ABSCESS - ORIGINAL ARTICLE

KEYWORDS

DR. SARIPALLI AMMAJI

ASSOCIATE PROFESSOR, DEPARTMENT OF SURGERY, RIMS SRIKAKULAM, ANDHRA PRADESH, INDIA.

DR. AKKIDAS. SUVARCHALA

ASSISTANT PROFESSOR, DEPARTMENT OF GENERAL SURGERY, KING GEORGE HOSPITAL, VISAKHAPATNAM, ANDHRAPRADESH, INDIA.

ABSTRACT

INTRODUCTION: Liver abscess is a common condition in India. India has 2nd highest incidence of liver abscess in the world. Liver abscesses are caused by bacterial, parasitic or fungal infection. Pyogenic abscesses account for three quarters of hepatic abscess in developed countries. While amoebic liver abscess cause two third of liver abscess in developing countries. **AIMS AND OBJECTIVES:** To analyse Age and Sex incidence, duration of onset, symptomatology, signs, laboratory investigations, microbiology, chest x-ray and ultrasonographic findings, treatment, complications, in patients of ruptured liver abscess managed by laparotomy. **MATERIALS AND METHODS:** A prospective study of forty patients with ruptured liver abscess was carried out for two years from October 20014 - october 2016. **RESULTS: Age and Sex incidence:** 95% of patients were male and 5% were female. Age of the patients included in this study varied from 20-70 years. The mean age was 45 years.

Analysis of symptoms: Pain abdomen was the commonest symptom occurring in 40/40 (100%). Fever was the next common symptom in this study (39/40) 97.5%. **Analysis of Signs:** Abdominal tenderness was elicited in 40/40 (100%) of the cases. Fever defined as temperature > 38.5°c (101°F) was present in 97.5% (39/40) of the cases. Signs of peritonitis were observed in 39/40 (97.5%) at presentation except in a patient who presented with abscess pointing onto parietal wall and later developed peritonitis, while being investigated and found to have ruptured left lobe abscess. **Alcoholism in cases of liver abscess:** All male patients (38/38) in this study were alcoholics. All these patients had history of consuming alcohol for more than 3 years. **Pus Culture Analysis:** Out of the total 40 cases included in this study, all cases were subjected to laparotomy and peritoneal toilet. Out of these 40 cases, 32/40 cases had 'Anchovy sauce' appearance of the pus and pus revealed no growth giving this a percentage of 80% where no growth was obtained. Organisms were isolated in 8/40 (20%) of these cases of which E.coli was isolated in 6/40 (15%) of cases and Klebsiella was isolated in 2/40 (5%) of the cases. **Ultrasound Abdomen Findings of Liver Abscess:** USG abdomen was done in all cases. Solitary abscess was observed in 29/40 (72.5%) of cases while multiple abscess were noted in 11/40 (27.5%) of the cases. Isolated right lobe abscess were seen in 29/40 (72.5%) of cases and left lobe abscesses were seen in 6/40 (15%) of cases. Both lobe involvement was seen in 5/40 (12.5%) of cases. 22 (55%) patients had hepatomegaly. Mortality Rate: Number of deaths in this study are 2 (5%). **CONCLUSION:** Liver abscesses occurred most commonly between 30-50 years. Males were affected more than females. Pain abdomen and fever are the most consistent symptoms. Alkaline phosphatase is the most consistently elevated liver function test in cases of liver abscess. Liver abscess usually presented as a solitary abscess most commonly in the right lobe of liver. Intra-peritoneal rupture, pleural or pericardial rupture, septicemia, death are the complications that can occur.

INTRODUCTION

Liver abscess is a common condition in India. India has 2nd highest incidence of liver abscess in the world. Liver abscesses are caused by bacterial, parasitic or fungal infection. Pyogenic abscesses account for three quarters of hepatic abscess in developed countries. While amoebic liver abscess cause two third of liver abscess in developing countries. Amoebiasis is presently the third most common cause of death from parasitic disease. The World Health Organisation reported that Entamoeba Histolytica causes approximately 50 million cases and 100,000 deaths annually. The vast majority of these infections are acquired in the developing world. In a country like India where majority of population lives below poverty line, basic sanitary facilities are lacking. This coupled with overcrowding and urban slums sets the stage for communicable diseases like Amoebiasis. Liver abscess continues to be disease with considerable mortality in our country. Locally made alcoholic drinks may be the routes of faecooral transmission of amoebic cysts. Primary prevention by improving sanitation, health education, early diagnosis and prompt treatment may result in lowering mortality / morbidity associated with the disease. This study has tried to delineate clinical profile, risk factors and management strategies of liver abscesses.

AIMS AND OBJECTIVES

To analyse Age and Sex incidence, duration of onset, symptomatology, signs, laboratory investigations, microbiology, chest x-ray and ultrasonographic findings, treatment, complications, in patients of ruptured liver abscess managed by laparotomy.

MATERIALS AND METHODS

A prospective study of forty patients with ruptured liver abscess was carried out for two years from October 20014 - October 2016.

INCLUSION CRITERIA –

- 1) Clinically and radiologically confirmed cases of ruptured liver abscess.
- 2) Both males and females of any age group.
- 3) Management is by laparotomy only.

EXCLUSION CRITERIA –

- 1) Conservatively managed liver abscess.
- 2) Ruptured liver abscess not managed by laparotomy.

Detailed clinical history was performed on all cases on admission. Diagnosis was made on the basis of clinical history and examination followed by ultrasonography. Patients underwent complete relevant blood investigations including liver function tests.

Abdominal pain and fever were the commonest presenting complaints. Haematological investigations included Haemoglobin, Total Count, Random Blood Sugar, Blood Urea, serum creatinine, complete liver function tests (SGOT, SGPT, serum bilirubin, ALP, serum albumin, total proteins, PT), Ultrasonography of abdomen was done in all cases. Serological tests for amoebic liver disease were not performed as the facilities were not available in our hospital and due to financial restraints. Chest X Ray was done in all cases. Pus was sent for gram's stain and culture and sensitivity. All patients were administered antibiotics intravenously initially upon admission.

Laparotomy was done in cases of rupture of liver abscess with peritonitis. Follow-up was done monthly for 3 months and then once after 6 months.

RESULTS

The study involved 40 patients of ruptured liver abscess admitted in King George Hospital and referrals from RIMS Srikakulam from October 2001 to October 2016.

Age and Sex incidence: 95% of patients were male and 5% were female. Age of the patients included in this study varied from 20-70 years. The mean age was 45 years. The highest incidence was noted in the age group of 31-40 years (27.5%). The lowest age of the patient in our study is 23 years and the highest age is 66 years.

Duration of symptoms:

In this study patients presented acutely within 1-7 days of onset of symptoms. Mean duration of symptoms in our study is 2.5 days.

Analysis of symptoms

Pain abdomen was the commonest symptom occurring in 40/40 (100%). Fever was the next common symptom in this study (39/40) 97.5%. Diarrhoea in 8/40 (20%) and history of jaundice was present in 30% (12/40) of patients. 14 patients (35%) presented with respiratory symptoms like cough. While 3 patients (7.5%) presented with features of shock like altered sensorium.

Analysis of Signs

Abdominal tenderness was elicited in 40/40 (100%) of the cases. Fever defined as temperature $> 38.5^{\circ}\text{C}$ (101°F) was present in 97.5% (39/40) of the cases. Signs of peritonitis were observed in 39/40 (97.5%) at presentation except in a patient who presented with abscess pointing onto parietal wall and later developed peritonitis, while being investigated and found to have ruptured left lobe abscess. Hepatomegaly defined as liver span > 11 cm was seen in 22/40 (55%) of cases. Hepatomegaly was usually tender, firm. Icterus was observed in 12/40 (30%) of cases clinically. 11/40 (27.5%) had pallor on general examination while 4/40 (10%) presented with shock and features of shock. Respiratory findings included right pleural effusion, basal consolidation, basal crepitations. In the present study, respiratory findings were present in 18/40 (45%) of the cases.

Alcoholism in cases of Liver Abscess

Average amount of alcohol intake - 200-250 ml/day
Duration of alcohol intake > 3 years

Alcoholism in cases of liver abscess

All male patients (38/38) in this study were alcoholics. All these patients had history of consuming alcohol for more than 3 years.

Percentage of abnormal laboratory investigations

Anemia (Hb < 10 gm/dl) were found in (11/40) 27.5% of the cases. Mean Hb in this study group was 10.7 gm/dl. The Hb% of the patients ranged from 6.0-13.4 gm%. Leucocytosis ($> 12,000/\text{cumm}$) was found in (33/40) 82.5% of cases. Mean

WBC count was 14,265 c/cumm and it ranged from 9000-19,000 c/cumm . 4/40 (10%) were found to be diabetic with RBS > 200 mg/dl. The mean RBS was 120 mg/dl and ranged from 60-390 mg/dl, raised urea (> 60 mg/dl) was found in 6/40 (15%) of which 4 patients developed acute renal failure. Mean urea levels in cases was 41 mg/dl and it ranged from 24-116 mg/dl.

Analysis of Liver Function Tests

Liver function tests were done in all 40 patients included in this study. Hyperbilirubinemia with serum bilirubin > 2 mg/dl was found in 12/40 (30%) of the cases in this study. The mean bilirubin levels were 2.1 mg% The liver function test which was most consistently raised was alkaline phosphatase. Alkaline phosphatase was found to be

raised in 31/40 (77.5%) of cases in this study. Hypoalbuminemia (< 3 gm/dl) was observed in 4/40 (10%) of the cases. Increased prothrombin time > 20 sec was seen in 2/40 (5%) of cases. Increased SGOT and SGPT was seen in 35% of the cases in this study.

Pus Culture Analysis

Out of the total 40 cases included in this study, all cases were subjected to laparotomy and peritoneal toilet. Out of these 40 cases, 32/40 cases had 'Anchovy sauce' appearance of the pus and pus revealed no growth giving this a percentage of 80% where no growth was obtained. Organisms were isolated in 8/40 (20%) of these cases of which E. coli was isolated in 6/40 (15%) of cases and Klebsiella was isolated in 2/40 (5%) of the cases.

Analysis of Chest x Ray Findings

CxR findings were analysed in all patients. They were normal in 22/40 (55%) of the cases. Right sided pleural effusion was noted in 18/40 (45%) of the cases. Right dome of diaphragm was elevated in 12/40 (30%) of cases.

Ultrasound Abdomen Findings of Liver Abscess

USG abdomen was done in all cases. Solitary abscess was observed in 29/40 (72.5%) of cases while multiple abscesses were noted in 11/40 (27.5%) of the cases. Isolated right lobe abscesses were seen in 29/40 (72.5%) of cases and left lobe abscesses were seen in 6/40 (15%) of cases. Both lobe involvement was seen in 5/40 (12.5%) of cases. 22 (55%) patients had hepatomegaly.

Mortality Rate: Number of deaths in this study are 2 (5%)

Incidence of HIV positive serology in cases of Liver Abscess

All patients in this study were tested for anti HIV serology. Only 2/40 (5%) of cases were found to have positive anti HIV serology while 38/40 (95%) were negative for anti HIV serology.

DISCUSSION

Liver abscesses are caused by bacterial, parasitic or fungal infections. Pyogenic abscess accounts for 2/3 rd of cases in west, whereas in the developing countries 2/3rd of cases of liver abscesses are due to Amoebiasis. Amoebiasis is presently the third most common cause of death from parasitic disease. The World Health reported that E. histolytica causes approximately 50 million cases and 100,000 deaths annually. The vast majority are acquired in developing countries.

AGE AND SEX INCIDENCE

In this study the age of the patients varied from 20 years - 70 years. The mean age was 45 years. The highest incidence was noted in the age group 31-40 years (27.5%). 50% of cases were in the age group of 31-50 years. The lowest incidence was noted in the age group of 61-70 years (10%) and rare below 20 years. 38/40 patients were males (95%) and 2/40 were females (5%). Mean age was 47.6 years according to Khee Siang Chang, Chin Ming¹ and 45.3 years according to Antonio² Gorgio, Luciano Torontino, Nicola, Mariniello. The incidence of amoebic liver abscess was nine times more frequent in males compared to females according to the Shyam Mattur³, RS Gehlot, Alok Mehta and Narendra Bhargava.

SYMPTOMS

All the patients presented within 1-7 days of onset of symptoms. The mean duration of symptoms is 2.5 days. Prognosis and recovery was good in those patients who presented within 2 days in this study.

Fever (97.5%) and pain abdomen (100%) are the most common symptoms in our study. The other symptoms such as jaundice, diarrhea, cough and altered sensorium were observed in 30%, 20%, 35%, 7.5% respectively. The 2 patients who expired had severe jaundice and altered sensorium thus inferring them to be bad prognostic factors.

According to Khee Siang Chang, Chin Ming¹ fever, pain abdomen,

jaundice, cough and altered sensorium were observed in 97.2%, 57%, 40.3%, 33%, 5% respectively. According to Shyam Mattur¹⁵, diarrhea was seen in 7% of patients.

ALCOHOLISM IN CASES OF LIVER ABSCESS

All the 38 male patients (95%) in our study had history of alcoholism (more than 200ml for more than 3 years). Thus it can be inferred from this study that alcoholism is the most consistent etiological factor in patients with liver abscess. However it is possible that it may have been contaminated by *Entamoeba histolytica* through faecooral route and may contribute to high incidence of cases of liver abscesses in alcoholics. According to Shyam Mattur³, RS Gehlot, Alok Mehta, alcoholism was found in 70% of their cases.

SIGNS

All the patients in this study had abdominal tenderness and fever. Other signs such as hepatomegaly, icterus, pallor and respiratory findings were observed in 55%, 30%, 27.5% and 45% respectively. The 2 patients who expired in our study had severe pallor, icterus, shock and signs of pulmonary abnormality (decreased breath sounds, basal rales). Thus it can be inferred that presence of pallor, icterus, shock and respiratory signs carry grave prognosis. According to Shyam Mattur³, RS Gehlot, Alok Mehta, found abdominal tenderness and fever were observed in 80% and 70% respectively. According to Chaturbhuj Lal Rajak⁴, Sanjay Gupta, abdominal tenderness occurred in 90% of their cases. Fever occurred in 97.2% according to Khee Siang, Chin Ming. According to Shyam Mattur, RS Gehlot, Alok Mehta, fever occurred in 70% of cases. According to Sumit Kapadia, Dinesh Dattaroy⁵, fever was present in 88% and icterus in 16% of cases. According to Antonio Georgio, Luciano Tarantino, Nicola Maciniello², hepatomegaly was seen in 50% of their cases. According to Khee Siang¹, Chin Ming, 5% of cases presented with shock.

LABORATORY INVESTIGATIONS

The mean Hb of the patients in this study was 10.7 gm/dl with a range of 6.0-13.4 gm%. Anemia was more commonly observed in the elderly age group of > 60 yrs. Further all patients who died due to liver abscess in this study were found to be anemic. There were 4 cases who were > 60 years in this study and except one patient, the rest all were anemic. Thus anemia may be an additional factor that may signify bad prognosis along with other adverse factors in deciding the mortality in liver abscess. Mean WBC count in patients of our study was 14,265 c/cumm with a range of 9000-19,000. The occurrence of diabetes in this study was 4/40 (10%). RBS > 200 mg/dl were considered diabetic. The mean RBS was 120 mg/dl and ranged from 60-390 mg/dl in patients of this study. Increased urea (> 60 mg/dl) was found in 6/12 (10%) of cases of which 4 developed multiorgan dysfunction. Raised urea values may thus suggest a state of multiorgan dysfunction and carry increased mortality and poor prognosis. According to Antonio Georgio², Lucian, Torontino, mean Hb in their cases were 11.2 mg% and range 8-14 g%. According to Khee Siang¹, Chin Ming, leucocytosis was found in 67.3% of patients. According to Steven Huy, B Han, diabetes was the frequent underlying condition in cases of liver abscesses. According to Stephen A. Barnes, Keith D. Lille more, Leucocytosis was seen in 70% of the cases.

LIVER FUNCTION TESTS

2 patients who died due to liver abscess in this study had jaundice. Hence raised bilirubin levels may be considered as a marker of bad prognosis in cases of liver abscess. ALP is considered as the single most consistent liver function test and is elevated in 31 patients of our study. 2 out of 4 patients with hypoalbuminemia and increased prothrombin time died due to liver abscess. Hence hypoalbuminemia with increased prothrombin time carries a bad prognosis in cases of liver abscess. According to Stephen A. Barnes, Keith D. Lilkmore, Hyperbilirubinemia was seen in 10% of their cases. According to Shyam Mattur³, RS Gehlot, Alok Mehta, high ALP was seen in 60-80% of cases of liver abscess. According to Chu KM⁶, Fan ST, hypoalbuminemia was an adverse prognostic factor in cases of liver

abscess.

PUS CULTURE ANALYSIS

Out of the 40 cases, subjected to laparotomy pus was sent for culture and sensitivity immediately. Of the 40 cases, 'Anchovy sauce' appearance of the pus was seen in 32/40 (80%) of cases and pus C/S revealed no growth. While pus culture was positive in 20% (8/40) of the cases, of which *E.coli* was isolated in 6/40 (15%) of cases and *Klebsiella* was isolated in 2/40 (5%) of cases. Khee Siang, Chin Ming in their study of 107 patients, found positive cultures from pus in 73% and negative cultures in 17%. The most common organism that was isolated in their study was *klebsiella pneumoniae* (65%) followed by *E.coli* (2%). According to Hiroshi Okano⁷, Kat Suyor Shikari, pus cultures were positive only in 50% of cases and *klebsiella* was detected in 62% of these cases.

CHEST X RAY FINDINGS

Of the 18 patients with abnormal Chest X Ray PA view 8 patients developed pulmonary atelectasis in the post operative period which increased their hospital stay. Hence it can be inferred that patients with preoperative or post operative pulmonary complication carry bad prognosis. According to D. Lynche⁸, William A. Jensen, normal CxRs were seen in 46% of their cases of liver abscesses. While abnormal CxR were seen in 53% of the cases. Right pleural effusion was seen in 30% of cases. Elevated right hemidiaphragm was seen in 27% of the cases.

ULTRASOUND ABDOMEN FINDINGS OF LIVER ABSCESS

Right lobe solitary abscess (72.5%) were more commonly observed in this study. 2 of the 6 patients with left lobe abscess presented as swelling in the upper abdomen which was confirmed by Ultrasound abdomen. Thus a variable presentation of left lobe abscess occurred. Multiple abscess were seen in 11/40 (27.5%) cases. Isolated left lobe involvement was seen in 6/40 (15%) of cases. Both lobe involvement was seen in 5/40 (12.5%) of cases. Patients having exudative ascites were considered as having ruptured liver abscess. Hepatomegaly was observed in 22/40 cases. According to Chaturbhuj Lal Rajak⁴, Sanjay Gupta, solitary abscesses were seen in 72% of cases and multiple abscesses were seen in 18%. Abscess were located in the right lobe in 72% of cases and left lobe in 12% of cases. Both lobe involvement was seen in 20% of their cases. According to Khee Siang, Chin Ming, solitary abscess was seen in 80.4% of cases and right lobe involvement was seen in 65.4% and 16% of these cases had isolated involvement of left lobe.

TREATMENT

Surgical drainage of ruptured liver abscess has been an accepted therapy for decades. All cases were started on metronidazole I.V. (2.0-2.5 gm/day in divided doses x 8-10 days). The treatment was laparotomy, thorough peritoneal lavage and drains were kept for all patients. The duration of hospital stay ranged from 10-16 days. Mean hospital duration was 11.5 days. According to Meng²⁶ and WU hospitalization averaged 58 days.

COMPLICATIONS

4 patients presented with multi organ dysfunction due to Septicemia, out of which only two survived. Postoperatively, 8 patients developed pulmonary atelectasis, Two patients developed wound complications that prolonged their hospital stay. 2 patients in this study expired one on 3rd POD and other on 5th POD due to multiorgan failure and pulmonary atelectasis. According to Khee-Siang Chan¹, Chin Ming et al, mortality rate in their study was 6.5%. According to Ken et al⁹, mean hospitalization was 14.6 days.

POSTOP FOLLOWUP

Patients were followed on OPD basis, once monthly for first 3 months and thereafter 6 monthly. Of the 38 pts survived only 32 patients were followed, 6 pts did not come for followup. Repeat scans were done as required. Relapses were noted in 2 pts. Repeat USG guided aspirations were done in these cases and patients responded well.

One patient presented with subacute intestinal obstruction within 3 months and managed conservatively. Two patients who developed wound complications developed incisional hernia.

RISK FACTORS

In this study, Age > 60 years, alcohol consumption, Jaundice, anaemia, cough, diabetes mellitus, pleural effusion, hypoalbuminemia were associated with longer time of resolution of symptoms and longer duration of stay. They were also associated with higher incidence of morbidity and mortality. Hence these factors are associated with worse prognosis. According to Lee et al¹⁰ (1991) clinical jaundice, pleural effusion, bilobar abscess, increased bilirubin levels, hypoalbuminemia, and increased transaminases were found to be the risk factors for increased mortality. Chou et al¹¹ (1994) identified age > 60 yrs, impaired renal function, hypoalbuminemia and increased bilirubin levels as risk factors of mortality.

HIV SEROLOGY IN PATIENTS WITH LIVER ABSCESS

In the growing epidemic of AIDS, our study also aimed to know if the increasing cases of liver abscess had an immunocompromised state or their causative factor. All patients in this study were tested first with ELISA for anti HIV antibodies. However, our study found anti HIV serology was positive only in 2/40 (5%) of cases. While majority were (95%) were negative for anti-HIV serology. Thus AIDS may not be responsible as a predisposing factor in the causation of liver abscess of the patients in our study and found no important significant difference between cases of liver abscesses who were anti HIV seropositive and anti-HIV seronegative.

CONCLUSION

Liver abscesses occurred most commonly between 30-50 years. Males were affected more than females. Pain abdomen and fever are the most consistent symptoms. Alkaline phosphatase is the most consistently elevated liver function test in cases of liver abscess. Liver abscess usually presented as a solitary abscess most commonly in the right lobe of liver. Intraabdominal rupture, pleural or pericardial rupture, septicemia, death are the complications that can occur. Liver abscess is still a disease associated with considerable mortality and morbidity.

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