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Evolving Management Strategies of Pyogenic Liver Abscess, A Prospective Series Case Study

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Abstract: In this cross sectional study we did a clinicopathological analysis of a series of cases to find out the effective modality of management for different cases of pyogenic liver abscess. Brief history, clinical examination findings, laboratory investigations, treatment rendered and the outcome were recorded. The commonest presentation was right lobe solitary amoebic liver abscess in alcoholic males of low socioeconomic status. Various techniques to drain pus and appropriate drugs reduce the mortality were tried. Each case was managed as per its individual clinical status and merit – either only with drugs, or drugs plus percutaneous aspiration, or drugs plus percutaneous catheter drainage or open drainage.

Keywords: Pyogenic liver abscess, Percutaneos aspiration, Percutaneos catheter drainage

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I. Introduction

Entamoeba histolytica is the pathogenic amoeba in man and is endemic in the Indian subcontinent, Africa and parts of central and South America. Half of the population gets infected but most remain asymptomatic carriers or cyst passers. 10% of the infected cases develop amoebic manifestations and out of them only few develop amoebic liver abscess. It is common in third or fourth decades of life with a male preponderance (20:1), alcoholics having a higher incidence. Iron content of the country liquor is the probable cause of an increase in invasiveness in adult males. Menstruating women with relative iron deficiency are immune to invasive amoebiasis.[1]

Contaminated water or food is the source of infection. Trophozoites released from cysts proliferate in the alkaline medium of the small gut. They invade into submucosa of colon and form the classical flask-shaped ulcers. From here they enter the portal circulation and get trapped in the interlobular veins of the liver. They cause focal infarction of hepatocytes and liquefaction necrosis releasing proteolytic enzymes. Necrotic patches coalesce to form the abscess cavity containing chocolate coloured odorless pus, a mixture of necrotic liver tissue and blood.[1,2,3] Abscess wall may show trophozoites in 20% of cases. Due to straighter course of the right branch of the portal vein and the laminar blood flow, in 80% cases the abscess occurs in the right lobe.[3] In 10% occurs in the left lobe and about 10% are multiple. The abscesses high in the right lobe subjacent to the diaphragm causes high incidence of pleural and pulmonary manifestations.[1] Needle aspiration and a course of antiamoebic drugs is more effective than drug treatment alone in the management of amoebic liver abscess.[4]

II. Material And Methods

The present study was conducted in Deprtment of Surgery, Dr Pinnamaneni Siddhartha Institute Of Medical Sciences And Research Foundation, Chinaoutpalli, Vijaywada between October 2011 to September 2016. A total number of 232 patients with pyogenic liver abscess were included. After a thorough clinical examination, an ultrasound of abdomen, x ray chest and upper abdomen was routinely done to confirm the diagnosis. An image guided needle aspiration was done in Radiology Department and samples were investigated. A complete hemogram, liver function tests , coagulation profile (PT/INR), viral markers (HIV, HBsAg, anti-HCV) and serological tests were done. Patients with symptoms of cough with expectoration were subjected to sputum for acid fast bacilli and a wet mount for trophozoites of Entamoeba histolytica. All non complicated abscesses < 5cm were treated with iv antibiotics, while > 5 cm abscesses were managed by image guided percutaneous aspiration or a continuous drainage with a 8F Malecot or pigtail catheter. The preferred antibiotics used were a third generation cephlosporine and iv metrogyl. When catheter output is reduced and becomes nil in 4 to 5 days time the catheter is pulled out and patient is discharged with advice to complete the full course of amoebicidal drugs. Surgical drainage is performed in big abscess cavities with impending rupture

or already ruptured cases. Patients were followed up for a minimum period of 6 months with repeat sonography of abdomen.

III. Result

In this prospective study of 232 patients diagnosed to have liver abscess, were managed and followed up for a period of 6 months. Age of the patients varied from 19 to 76 years. The highest incidence was noted in the 31-40 years and 51 -60 years. The mean age of the patients was 45.13 year, about 69.3% of the cases were from lower socioeconomic class.

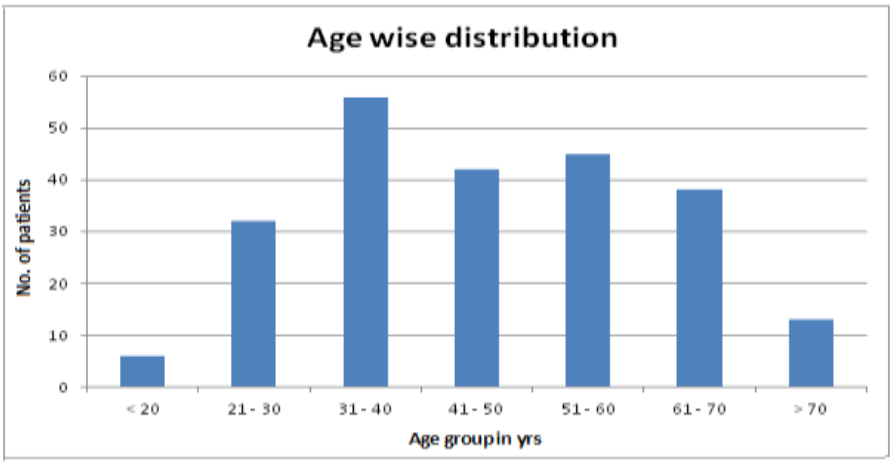

Fig. 1

Earlier peak incidence occurred in young age 20s and 30s due to acute appendicitis for non availability of effective antibiotics. The scenario has altered now due to better diagnosis using high quality imaging techniques and early appropriate antibiotics and now it is mostly seen in 50s and 60s.[3,5] Female cases were very few, male to female ratio being 24.7:1. Most of the patients (68.3%) were regular drinkers (alcohol intake ≥ 3 times/week), some (23.6%) were occasional drinkers (< 3 times/week) and very few non drinkers.

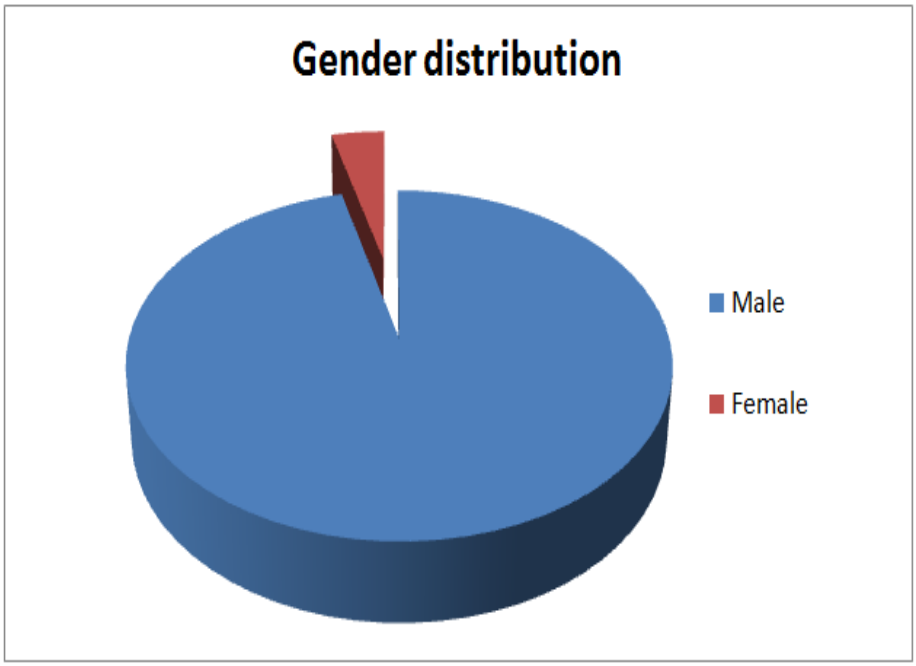

Fig 2

Pain abdomen was the most common symptom (98.7%). Enlarged tender liver was the most common finding on palpation of abdomen. Pleural effusion was detected in > 25% of the patients on the right side. Bilateral effusion was also found in few patients.

Presenting symptoms	No. of cases	Percentage
Pain abdomen	229	98.7
Fever	176	75.86
Diarrhoea	35	24.14
Jaundice	24	13.79
Respiratory symptoms	16	15.08

Duration of illness	Time period	No. of patients	Percentage
Acute	< 7 days	137	59.05
Sub- acute	7 days -2 months	76	32.76
Chronic	>2 months	19	8.19

3 cases were sero positive for anti HIV but none were having pulmonary tuberculosis. Pus culture was positive in 28 cases and Klebseilla, Escherichia coli, Enterococcus, Staphylo coccus and bacteroids were the most common organisms isolated.

IV. Discussion

Pyogenic liver abscess is a problem across the globe, well known for last 100 years as a common cause of morbidity and mortality. Most of the cases in tropical countries like India are of amoebic aetiology, due to overcrowding and poor sanitary condition.[2,6] Incidence is more in elderly, diabetics and immune suppressed cases. Right upper abdominal pain referred to the right shoulder tip or pain in right lower chest are suggestive of amoebic liver abscess. Patients look toxic with high grade fever and pallor. Cough, sweating, malaise, loss of weight, anorexia, flatulence and hiccough may be there. Localized swelling in the epigastrium or right upper abdomen may be seen.[7] Enlarged tender liver, intercostal tenderness or oedema are typical findings. A moderate leucocytosis (70 to 90% cases), anaemia, hypoalbuminemia and an elevated ESR is noted in many cases.[5]

The liver function tests may show mild to moderate elevation of alkaline phosphatase. The transaminase values remain unaltered but in large abscess prothrombin time may be prolonged and INR elevated. Jaundice is uncommon in amoebic liver abscess, but if present may be due to hepatocellular dysfunction or intrahepatic biliary obstruction.[8] Pus culture is positive in less than 20% cases. Indirect haemagglutination test is the most sensitive and specific for invasive amoebiasis.[3] If amoebic serology is negative, a diagnostic aspiration and culture sensitivity is done to rule out a pyogenic abscess.[9]

An elevated right diaphragm, right sided pleural effusion or an evidence of basal atelectasis is found in x-ray chest in about 25% cases. Left lobe involvement may present with an epigastric mass.[3] CT and MRI is needed in complicated cases only where the abscess has ruptured or when there is a need to rule out malignancies which is cannot be detected with routine investigations. CT shows low attenuated area in abscess. Small abscess can be detected in a high resolution CT. MR has no added advantage.[3] Air cavitogram is done during a follow up by injecting about 50 ml of air into the abscess cavity helps to assess, the reduction in size of the abscess cavity.

Fig. 3

Fig 4

Ultrasonography is the investigation of choice, both for diagnosis and therapeutic procedures. An abscess cavity is seen as hypo-echoic or anechoic oval lesion with poorly defined borders and internal echoes. The accuracy rate of USG is over 95% and is used for therapeutic aspiration. In uncomplicated cases, complete healing occurs and no residual lesions are seen in the liver in a review sonography. Progress of healing can be assessed, where the cavity becomes increasingly hypoechoic and assumes a smoother margin with treatment. A complete healing may take 2 weeks to one year depending on the initial size of the abscess cavity.[10] Metronidazole is the drug of choice in amoebic abscesses for its added advantage of controlling anaerobic infections.[7,10] Initially iv and then PO 800 mg thrice daily for 10 days cures 95% of cases. Ciprofloxacin - 200mg IV or 500mg orally can be added to metronidazole. Other Nitroimidazole compound like Tinidazole, Secnidazole also have shown a marked therapeutic response and used if metronidazole is not tolerated.[10,11] Emetine and chloroquine are effective tissue amoebicides. Parenteral emetine causes serious cardiac toxicity, so a less toxic Tab. Chloroquine phosphate is preferred in a dosage of 600mg base daily for 2 days, followed by 300mg base for 3 weeks. Luminal amoebicides like Tab. Diloxanide Furoate 500 mg given thrice a day for 10 days, to eradicate the cysts in the intestine in a carrier and to prevent a relapse of infection.[3,10]

Small abscesses respond satisfactorily to drug therapy alone. Needle aspiration combined with antiamoebic drugs is more effective than drug treatment alone in the management of amoebic liver abscess.[2,4,5] Adjunct Surgical intervention is required in a few complicated cases.(S) All left lobe abscess, abscess of size >5 cms, impending rupture (<1 cm liver tissue between abscess and liver margin) and cases not responding to conservative treatment at the end of 48 hours need intervention.

Fig. 5

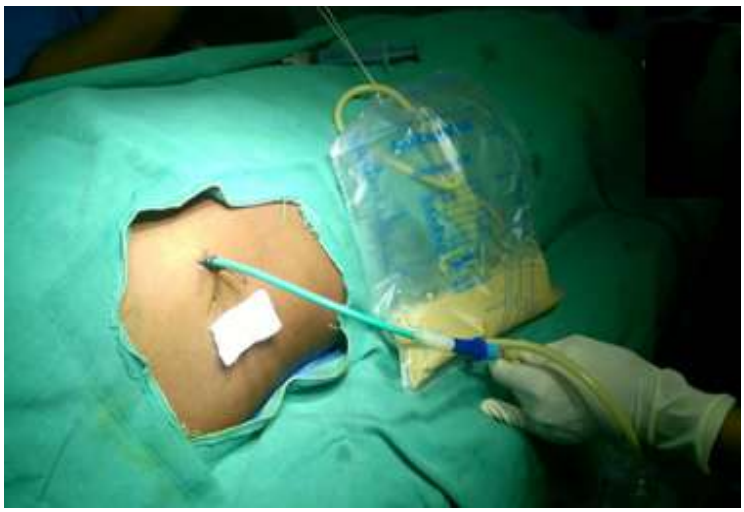

Fig. 6

Ultrasound guided aspiration needed if abscess size >5cm or content is >500ml, multiple abscess involving both lobes of liver, if there is no response to medical treatment in 4–5 days. If needle aspiration fails due to thick pus or an impending rupture or compression sign is present, a percutaneous catheter (8 -12F pig tail or Malecot) is placed under USG guidance under local anesthesia.

Modality of treatment	No. of cases	Percentage
Drugs only	18	7.76
Percutaneous aspiration	138	59.48
Catheter drainage	63	27.16
Laparotomy	13	5.60

In majority of cases percutaneous aspiration was done under sonographic guidance and patients were put on amoebicidal protocol. Continuous catheter drainage was done with Malecot or pigtail catheter in 63 cases. In 13 cases of rupture or impending rupture laparotomy and exploration was needed.

Fig. 7

Fig. 8

Peritoneal rupture may be seen in 5-10% cases resulting in sub diaphragmatic abscess, or localized or generalized peritonitis and is associated with a high mortality. If collections are localized, can be managed by antibiotics and percutaneous catheters placed under laparoscopic or sonographic guidance to avoid surgery.[12] In case of generalized peritonitis an open drainage by emergency laparotomy is mandatory for a peritoneal toileting and a catheter drainage of liver abscess.

Fig. 9

Fig. 10

The incidence of rupture in to pleural space varies between 2-17% of cases, may lead to amoebic empyema, lung abscess or hepato-bronchial fistula and patient may cough out amoebic pus. Right pulmonary rupture is the commonest.[12] Pleural effusion if present may be aspirated, reaspirated if reaccumulates. Postural drainage of pus from chest, Metronidazole and evacuation of liver abscess is the treatment. Left lobe

abscess may result in sympathetic pericardial effusion or may rupture to cause cadiac tamponade where a needle aspiration and metronidazole therapy is needed. Rupture in to duodenum, kidney, bowel may happen are to be dealt with accordingly. The morbidity increases and at time mortality occurs if diagnosis is delayed.[13]

Conclusion:

Even if no definitive proof is found, appropriate clinical features, typical radiological sonological findings, a satisfactory response to treatment with amoebicide drugs indicates it is a case of amoebic liver abscess. Amoebic pus is almost always sterile unless secondarily infected. Conservative treatment is advocated in non complicated abscesses having no features of rupture or impeding rupture and no features of compression effect. Nitromidazoles are effective tissue amoebicides. An 18 gauge LP needle is put under image guidance to evacuate the abscess cavity. Needle is not introduced beyond a depth of 8 cms. One aspiration is enough if pus is < 200 ml. Repeated aspirations necessary if it is > 250ml on first aspiration and pain, constitutional symptoms still persist.[9] But more than 4 aspirations is never done rather a continuous tube drain is preferred.

Percutaneus drainage was first reported in 1953 but gained popularity after 1980s. Now due to simplicity of treatment, percutaneous catheter drainage has become the main stay of treatment with a success rate is 66 to 90%. In larger abscess of >5cm, a better success rate is achieved with surgical drainage. Repeated aspirations (3 to 5) may be required in 25% of cases. Outcome is poor if abscess volume is > 500ml, elevated serum bilirubin >3.5mg%. encephalopathy, hypoalbuminemia < 2 Gm%, multiple abscess, in HIV infection. However mortality from liver abscess has strikingly improved in last 70 years. [3]

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