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Management of Liver Abscess : Prospective Comparative study of Needle Aspiration and Surgical Drainage

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I. Introduction

Liver abscess is a suppurative cavity in the liver resulting from the invasion and multiplication of microorganisms, entering directly from an injury through the blood vessels or by the way of biliary ductal system. Liver abscess are most commonly due to amebic, pyogenic or mixed infections. Less commonly these may be fungal in origin. Amebic liver abscess occurs most commonly on a world wide, basis, the pyogenic liver abscess predominates in the united state.

Liver abscess is found more commonly in men between 20-40year age, but can occurs at any age. Approximately 60% are solitary and mainly located in right lobe of the liver, as a result of the streaming of portal blood flow secondary to the fact that right lobe is predominantly supplied by the superior mesenteric vein, and most of the hepatic volume is in the right lobe. Patient usually presents with a constant dull pain in the right upper quadrant of the abdomen which may be referred to the scapular region or the right shoulder. These patients usually have fever between 30degree to 40degree centigrade.

Liver abscess, both amebic and pyogenic continue to be an important cause of morbility and mortality in tropical countries. However, recent advances in interventional radiology, intensive care, progress in antibiotic therapy and liberal use of sonography and computerized tomography scanning of the abdomen have advantages of early diagnosis and treatment of patients with liver abscess, thus improving the patients outcome.

Ultrasonography guided Needle aspiration of liver abscess has been an important advantage in treatment of liver abscess.The Primary mode of treatment of amebic liver abscess is medica. However as many as 20% of amebic liver abscess is refractory to medical treatment, Secondary bacterial infection may complicated 20% amebic liver abscess. In such patients and in patients with pyogenic liver abscess surgical drainage has been the traditional mode of treatment. However, surgical drainage is associated with significant (10-45%) morbidity and mortality. In recent years ultrasonography guided Needle aspiration has been increasingly used to treat liver abscess with reported success rate from 75-95%. Recent study has claimed Needle aspiration to be simpler, less costly and highly effective mode of treatment.

II. Material And Methods

The study was multiple centre prospective comparative study conducted in departments of surgery and Radiology. A total of 70 patients were included in study randomized into two groups, ultrasonography guided Needle aspiration (n=35) and surgical drainage (n=35). The patients were studied from 2018 to 2020.

INCLUSION CRITERIA: Patients were selected from those attending the out patients and emergency at various hospital. The age of the patients varied from 14 to 62 years. All patients diagnosed to have liver abscess clinically and radiologically(Ultrasonography and or CT) were included in the study.

EXCLUSION CRITERIA : Patients having abscess cavities smaller than 5 cm in greatest dimension ; prior intervention; ruptured liver abscess; uncertain diagnosis; concomitant biliary tract malignancy and uncorrectable coagulopathy were excluded from study.

All cases were carefully worked up in terms of a detailed history and clinically examination lab and imaging intervention included complete hemogram; liver function test; prothrombin time; international normalization ratio; activated partial thromboplastin time; blood culture amoebic serology; imaging-chest xay; abdominal Ultrasonography with or without CT Scan of the abdomen etc.

All the patients empirically received injection Metronizade 750 mg IV 8 hourly; injection Cefazoline 1 gram iv 12 hourly and injection Amikacin 500mg iv 12 hourly; Patients in whom pus culture was sterline continued on the same treatment. The antibiotics and metronidazole were given for duration of 10 and 14 days respectively.

USG GUIDED NEEDLE ASPIRATION: The patient was subjected to Ultrasonography of the abdomen and the characteristics of the abscess cavity (es) were recorded. Local anesthesia was infiltrated at the proposed puncture site using a 23 G needle under USG guidance using 18 G BD spinal needle the abscess cavity was entered and pus was aspirated till no more pus could be aspirated further. A sample of pus was sent from gram stain, culture and sensitivity and wet mount for Entamoeba histolytica trophozoites.

SURGIGAL DRAINAGE : The patient was subjected to laparotomy . Both lobe of liver inspected abscess localized and drained surgically. Pus along with nectroic debri suctioned and abscess cavity washed with normal saline followed by metronidazole solution. Peritoneal cavity was washed with adequate amount of normal saline to remove any spillage. ADK drain given at right paracolic gutter. Abdomen closed in layers Dressing applied.

EVALUATION OF RESPONSE TO INTERVENTION:

In patients who underwent Ultrasonography guided Needle aspiration , clinical response (pain abdomen and temperature) and laboratory parameters(total leukocyte count and Liver function test) were recorded on daily basis. Ultrasonography was repeated after a gap of two days and aspiration repeated if the cavity size was still found to be greater than 5 cm. The same procedure was repeated after a gap of another two days and aspiration repeated if needed. Failure of clinical improvement in terms and abdominal pain and tenderness, fever, leucocytosis& size of abscess cavity more than 5 cm after third attempt of aspiration was taken as failure of Ultrasonography guided Needle aspiration.

In patients who underwent surgical drainage , besides recording the clinical and laboratory parameters of the patients everyday, daily output of the ADK drain was measured and drain was flushed with 20 cc of normal saline. A decision to remove the drain was made when the total drainage from drain decreased to less than 10ml/24 hours for two consecutive days. The patient was administered Tab. Diloxanide Furoate 500 mg 12 Hourly for 10days at the time of discharge. Failure of clinical improvement in 10 days and failure of 50% reduction in size of abscess cavity even after 12 days was taken as failure of surgical drainage.

FOLLOW UP : The patients were followed up weekly for a month monthly for 3 months and at the end of six months for clinical evaluation and Ultrasonography assessment of abscess cavity until complete resolution of abscess was achieved.

OVSERVATION: It was observed that right upper quadrant pain was the most common symptom, followed by fever and weakness. Nearly half of patients had symptoms of anorexia, weight loss and night sweats. Only 10% of the patients gave a history of diarrhea prior to illness.

Table 1 : Symptoms in order of decreasing frequency.

Symptoms	Percentage (%)
Right upper quadrant pain	96
Fever	93
Anorexia	90
Weakness	90
Weight loss	57
Night Sweat	46
Nausea/vomiting	30
Chills/rigor	27
Diarrhea	10

Amebic serology was found positive in Amoebic liver abscess & Pus culture result was found positive in pyogenic liver abscess Both test was found positive in amebic with secondary bacterial infection. Culture were found to be positive in 23 out of 70 patients. Klebsiella was isolated most frequently i.e., 10 of 23 culture positive patients. It was closely followed by E. Coli which was isolated in 7 cases. Amoebic liver abscess were encountered more frequently (60%) compared to pyogenic (27%), amebic abscess with secondary bacterial infection (13%) and abscess of indeterminate etiology in 13% Majority (83%) of the abscess were located in right lobe of river , 13% in left lobe and 10% in both lobe of river. Three quarters of cases cavity whereas the rest of the patients had multiple abscess cavities was mostly between 200 to 900 ml. In USG guided aspiration group volume of largest cavity was 780 cc and in surgical drainage group volume of largest cavity was 832 cc.

Ultrasonography guided Needle aspiration was successful in 32 out of 35 cases. Out of 32 cases successfully treated, 19 required only one aspiration, 8 cases required two aspiration, and 5 cases required three aspiration. Three cases who did not show decrease in cavity size despite three aspiration were taken as failure. Surgical drainage was successful in 28 out of 35 cases. In rest seven cases, there was no clinical improvement even after 10 days of surgical drainage as well as there was no 50% reduction in size of abscess cavity even after

12days. Hospital stay was 8-10 days for USG guided needle aspiration group and 12-15 days for surgical drainage group.

III. Discussion

Liver abscess is a major tropical disease of the grastrointestinal system. Pyogenic liver abscess which used to be mainly tropical in location is now more common due to increased biliary interventions, stenting, cholecystitis and cholangitis. Liver abscess is 3 to 10 times more common in men. In our study we found the male to female ratio to be 8:1. The most frequently affected age group was in the Third and fourth decade.

The clinical presentation of the patients studied in our series was similar to the description in previous reports. The common symptoms and signs of liver abscess in our study were right upper quadrant pain (96%), fever (93%), and hepatomegaly(82%). These clinically manifestation is similar to those described in previous studies. In our study,83% of the abscess were located in the right tobe of liver, similar to previous studies. The type of abscess was determined on the basis of amebic serology and pus culture reports. In our study we found 60% of the abscess to be amoebic in etiology, 27% to be pyogenic. Similar experience has been reported by other researchers as well.

We performed Ultrasonography guided Needle aspiration and Surgical drainage in 35 patients with uncomplicated liver abscess and obtained good results. There was no mortality or any major complication requiring any treatment. Several groups have reported reasonably good results with USG guided Needle aspiration with systemic antibiotics. 3 patients who failed to improve on USG guided Needle aspiration , improved on Percutaneous pigtail catheter drainage. 7. patients who did not respond to surgical drainage, was further investigated and treated by either USG guided Needle aspiration or Percutaneous pigtail catheter drainage. Approximately similar results has been reported by others groups as well. Herman et. al advocating surgical drainage as a good alternatives as a first step in septic patients. where a delay in adequate drainage can lead to high morbidity and mortality rate. The mean duration of time taken for clinical improvement was 6-8 days in USG guided Needle aspiration group and 8-10 days in surgical drainage group.

TABLE 2: INTERVENTION AND THEIR RESULTS

Parameter	USG guided needle aspiration (n=35)	Surgical drainage (n=35)
Volume of largest cavity (c.c)	780.00	832
Success (%)	91	80
Hospital stay (days)	8-10	12-15
Clinical improvement (days)	6-8	8-10
Time for 50% reduction in cavity size (days)	8-10	10-12

IV. Conclusion

USG guided Needle aspiration is less invasive, less expensive simple and highly effective mode of liver abscess treatment particularly in multiple abscess cavities which can be aspirated easier in the same setting, whereas surgical drainage is more invasive, more expensive, complex and associated with higher morbidity. Surgical drainage is more effective in complicated, multilocuted thick walled abscess with viscous pus. It is better to say that treatment of liver abscess should be individualized.

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