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Original Research Article

A clinical study on the presentation and management of liver abscess in eastern Uttar Pradesh and evaluation of a low cost technique of percutaneous catheter drainage

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ABSTRACT

Background: The objective of the study was to assess the outcome of various modalities of treatment and evaluation of a low cost technique of percutaneous catheter drainage of liver abscess.
Methods: A prospective study of patients with liver abscess was conducted in a tertiary care centre over a period of one year. Since the cost of commercially available catheter (pig tail type) for image guided percutaneous drainage of liver abscess is quite high (approx Rs 800) and considering the fact that a considerable population in eastern Uttar Pradesh is poverty stricken, this study includes an evaluation of low cost technique of percutaneous drainage of liver abscess as a pilot project. In the present study K-90 was used as "low cost drainage" and compared with pig tail catheter drainage.
Results: Total 34 patients with liver abscess were enrolled in the study. 31 cases were male and 3 cases were female. 34 cases were subjected to catheter drainage (pig tail catheter, K-90) yielding varying quantities of pus from 300 ml to 2200 ml, depending on the size of the abscess. 15 out of 34 patients underwent tube drainage (K-90) by our innovative trochar cannula system using 5 mm laparoscopic metal trochar.
Conclusions: Although, compared to pig tail drainage, K-90 tube drainage is associated with more number of minor complication and prolonged hospital stay, however looking to the advantages and greatly reduced cost its use is probably justified.

Keywords: Liver abscess, Percutaneous catheter drainage, K-90 catheter, Pig tail catheter

INTRODUCTION

Liver abscesses, both amoebic and pyogenic, continue to be an important cause of morbidity and mortality in tropical countries. Liver abscess continues to be disease with considerable morbidity and mortality in our country. It usually presents with fever with rigors, pain in right upper quadrant.

The diagnosis of liver abscess is not always easy even in an endemic area. These cases are initially managed by the general practitioners as malaria, typhoid, cholecystitis and if the symptoms persists, they are referred to tertiary centers. Liver abscess has been associated with higher morbidity and mortality rates all over the world. Mode of treatment offered to the patient include medical management alone, image guided percutaneous aspiration, catheter drainage and open surgical drainage. Although the primary mode of treatment of amoebic liver abscess is medical, 15% of amoebic abscess may be refractory to medical therapy.[1,2] Also secondary bacterial infection may complicate up to 20% of amoebic abscess.[3]

It is suggested that, if the diagnosis can be made early, conservative treatment has a high success rate with minimum incidence of requirement of intervention procedures. The increasing availability of imaging and pathology facilities has helped in earlier diagnosis of the abscess. These techniques including ultrasound, computerized axial tomography, MRI in association with image guided diagnostic aspiration have reduced the diagnostic delay but still a large number of cases present very late giving rise to complications. This is especially true of deprived areas like eastern Uttar Pradesh where qualified medical care is scarce.

Since the cost of commercially available catheter (pig tail type) for image guided percutaneous drainage of liver abscess is quite high (approx Rs 800) and considering the fact that a considerable population in eastern Uttar Pradesh is poverty stricken, this study includes an evaluation of low cost technique of percutaneous catheterization of liver abscess as a pilot project.

The technique involves use of standard 5 mm trocar cannula (metal) of laparoscopic set which is inserted into the abscess cavity under USG guidance after local anaesthesia, a sterile PVC urethral catheter (K-90, cost approx 20 INR) is inserted through the cannula into the abscess cavity. This is a prospective study of liver abscess in Nehru hospital attached to B.R.D. Medical College. Study was conducted over a period of one year.

METHODS

Patients presenting with pain abdomen (right upper quadrant), fever with chills, cough with right lower chest pain, history of chronic alcoholism, tender hepatomegaly and Jaundice selected for screening of liver abscess. Patients with other symptoms like loss of weight, hiccoughs, right shoulder pain, diarrhea, nausea/ vomiting and distention of abdomen with any of the above signs and symptoms were subjected to ultrasound abdomen examination. USG abdomen was done, using longitudinal, oblique, transverse planes to visualize almost all part of liver. Intercostals and sub costal planes were used. All the liver lesions suggestive of abscess were examined in detail. Gross morphology of liver abscess was examined in detail with special attention to hepatomegaly, number, size, volume of abscess and their locations in relation to anatomy of liver, contiguity of abscess to the liver capsule, thickness of liver parenchyma to be travelled for percutaneous drainage and a safe drainage route to avoid the bowels and costophrenic recess. Echogenecity of the abscess assessed, (hyperechoic, hypoechoic, anechoic).

Inclusion criteria

Liver abscess both pyogenic and amoebic with following USG findings were included in the study diameter of pus cavity >5 cm; volume >500 cc; located in right lobe.

With comprehensive history clinical examination, radiological (USG abdomen) investigation provisional diagnosis of liver abscess was made. All patients were hospitalized and treatment started empirically with injection metronidazole 40 mg/kg body wt. per day, injection ceftriaxone 50 mg/kg body wt per day and intravenous fluid depending upon condition of patient. Patients not responding to medical management within 7 days were subjected to ultrasound guided diagnostic aspiration, which showed either characteristic anchovy sauce pus or purulent yellowish pus, which confirms the diagnosis. No response to the initial treatment was defined as a patient having persistent signs of sepsis after 7 days of intravenous antibiotics. Patients were further put on USG guided K-90 tube drainage or pigtail catheter drainage depending on financial condition of patient.

Technique of K-90 tube insertion

The technique involves use of standard 5 mm metal trocar cannula of laproscopic surgery which is inserted into the abscess cavity under USG guidance after local anaesthesia infiltration. The trocar is withdrawn and aspiration of pus through gas port confirms entry into the abscess cavity, The valve assembly of the port is dismantled leaving the cannula alone in the abscess cavity, a sterile PVC urethral catheter (K-90) is inserted through the cannula into the abscess cavity, after which the cannula is pulled out, the catheter is firmly anchored to skin by sutures.

Catheter was kept in situ for a period of 10 to 13 days. Follow up was done using USG every alternate day. In the present study K-90 as “low cost drainage” was used for drainage of liver abscess. The catheter was placed in 8th, 9th or 10th intercostal space, or the site as guided by ultrasonography under local anesthesia.

Immunocompromised patient, patient of liver failure, patient on anticancer chemotherapy, pregnancy, associated hydatid cyst and neoplastic secondaries were excluded from study. Abscesses that were amenable to only surgical drainage, like rupture or concomitant surgical pathology requiring urgent surgical exploration, were also excluded from the study.

RESULTS

The age group in this study ranges from the 18 to 70 years. Highest incidence of age is found between 3^{rd} – 6^{th} decades. Our study shows 64.4% patients in the age group of 3^{rd} to 5^{th} decades. Youngest one is 18 years old male. Mean age of presentation is 42.3 years. 31 cases were male and 3 cases were female. Almost all patients were from low socio economic group. 28 patients (84.4%) were alcoholic. In our study of 34 cases of liver abscess, 33 cases gave history of right upper quadrant pain, which was dull aching, and a few patients gave history of pain referring to right shoulder. Fever with chills and rigors seen in 30 cases, anorexia in 12 cases. 5

cases gave history of diarrhea and cough in 10 cases which was mostly dry in nature. 28 patients have variable degrees of anaemia (Hb <10 gm/dl), jaundice seen in 8 cases (23.5%), tachycardia in 33 (97%) cases. Prothrombin time, APTT and INR were deranged in 6 patients. Tender hepatomegaly is a significant finding seen in 61.7% of cases. 34 cases were subjected to catheter drainage (pigtail catheter, K-90) yielding varying quantity of pus from 300 ml to 2200 ml, depending on the size of the abscess. 15 out of 34 patients underwent tube drainage (K-90) by our innovative trochar cannula system using 5 mm laproscopic trochar. Pigtail catheter was used in 19 cases. The blockage of catheter was observed more in pig tail catheter while no case of blockage seen with K-90. The average period of continuous catheter drainage in case of pigtail was 10.2 days and in case of K-90 was 12.6 days.

DISCUSSION

US-guided percutaneous needle aspiration ± catheter drainage combined with antibiotics is the initial method of choice for pyogenic liver abscess. Catheter placement should be considered in larger abscesses (>5 cm diameter). General recommendations are for at least one week of drainage with USG follow-up. Multiple, small abscesses may not be amenable to aspiration.[4] Routine aspiration of amoebic liver abscess is not indicated for diagnostic or therapeutic purposes.[5] Predictors of need for aspiration include-

- Abscesses >5 cms,
- Involvement of both lobes of liver and
- Failure of medical therapy after 7 days.[4]
- Large abscess having impending rupture/ compression sign.
- Thin rim of liver tissue around the abscess.

Complications of percutaneous drainage include perforation of adjacent abdominal organs, pneumothorax, hemorrhage and leakage of abscess contents in peritoneum. Percutaneous placement of indwelling catheter provides continuous drainage; hence the problem of incomplete evacuation and reaccumulation are not associated with catheter drainage, accounting for good success rate of catheter drainage reported in earlier studies. Since the cost of commercially available catheter (pig tail type) for image guided percutaneous drainage of liver abscess is quite high (approx Rs 800) and considering the fact that a considerable population in eastern Uttar Pradesh is poverty stricken, this study evaluates a low cost technique of percutaneous catheterisation of liver abscess as a pilot project. Relief of symptoms and sonographic evidence of abscess resolution such as disappearance of abscess cavity or static or decrease in size of abscess cavity considered as the criteria for success of the study.

In our study success rate of 100% was seen similar to study by Rajak et al, whereas in studies by Wong et al, Gerzof et al and Kapadia et al success rate was 85%,83%, 88% respectively.[6-9] Duration of drainage in our study was compared with other studies (Table 1).

In present series complication rate was 35.5% which is comparable to Kapadiya et al study (40%), but was comparatively less (p=0.004) from the study of Yoo et al where the complication rate was 59.0%.[9,12] Our study did not have any major complication although the incidence of minor complication in case of K-90 tube drainage was 20% and in case of pigtail drainage was 15.5%. On statistical analysis no significant difference was found in complication between two technique except peritubal leakage which is more common in case of K-90 tube drainage (p=0.001) (Table 2).

Table 1: Duration of drainage.

Study group	Our study		Rajak et al.[6]	Wong et al.[7]	Sonnenberg et al.[10]	Gerzof et al.[8]	Singh, et al.[11]	Kapadia et al.[9]
	Pig tail	k-90						
No. of days	10.2	12.6	7	25	4	18	4.5	14

Table 2: No of patients with different complications.

Type of complication	k-90 tube drainage (n=15)	Pig tail catheter drainage (n=19)	P value
Blockage of catheter	0	3	0.23
Local wound infection	8	4	0.07
Peritubal leakage	8	2	0.001
Localized peritonitis	2	0	0.18

Table 3: Treatment response.

Criteria for response	Pig tail catheter drainage	K-90 catheter drainage
Average period of drainage	10.2	12.6
Average duration of hospital stay	20.5	22.2

CONCLUSION

Although, compared to pig tail drainage, K-90 tube drainage is associated with more number of minor complication and prolonged hospital stay, however looking to the greatly reduced cost its use is probably justified. To summarize, both percutaneous pigtail catheter drainage and k-90 tube drainage are safe and effective mode of treatment of liver abscesses Ultrasound guided percutaneous aspiration, pig tail drainage, K-90 tube drainage are safe and effective method of, both amoebic and pyogenic. It results in an early relief of symptoms and faster resolution of abscess cavity. The low morbidity and high success rate in treating liver abscesses, which otherwise would have a fatal outcome if untreated, by this minimally invasive method suggests that this therapy should be the first line of management in moderate to large sized liver abscesses.

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