Research Article

Ultrasound-guided fine-needle aspiration cytology of hepatic mass - A minimally invasive diagnostic approach

Khushboo Likhar, Aksharaditya Shukla, C V Kulkarni, Varsha Argal

Department of Pathology, Mahatma Gandhi Memorial Medical College, Indore, Madhya Pradesh, India

Correspondence to: Khushboo Likhar, E-mail: drkhushboo12@gmail.com

Received: September 29, 2018; **Accepted:** October 17, 2018

ABSTRACT

Background: Ultrasound-guided fine-needle aspiration (FNA) is a safe, simple, accurate, rapid, and an effective method for approaching a hepatic lesion. **Objectives:** The objectives of this study were as follows: (1) To assess the utility of ultrasound-guided FNA cytology (FNAC) in the diagnosis of hepatic mass, (2) to categorize hepatic masses into benign and malignant lesions to assess the nature of mass, and (3) to study the cytomorphological features of various liver lesions. **Materials and Methods:** The study was conducted in the department of pathology between January 2014 and April 2016. Ultrasound-guided FNAC was performed on 62 patients with hepatic mass lesions. The patients with hemangioma and hydatid disease of the liver diagnosed by ultrasonography were excluded to prevent undue complications. **Results:** There were 39 (62.9%) males and 23 (37.09%) females with a mean age of 52.5 years ranging from 10 to 85 years. Samples were adequate in 57 (93.5%) and inadequate in 5 (6.5%). Of 57 adequate samples, five show inflammation, two were benign, and 50 were malignant. Of the inflammatory lesions, pyogenic liver abscesses in 3 (5.26%) and amoebic liver abscesses in 2 (3.51%). Benign lesion included hepatic adenoma in 2 (3.51%). Of the malignant lesions, metastatic adenocarcinomas was in 22 (38.60%), hepatocellular carcinomas was in 10 (17.54%), metastatic deposits of poorly differentiated carcinoma was in 10 (17.54%), metastatic squamous cell carcinoma was in 5 (8.78%), hepatoblastoma was in 2 (3.51%), and cholangiocarcinoma was in 1 (1.75%) case. All the hepatocellular carcinomas in our study occurred in males (4 of 4). **Conclusion:** Ultrasound-guided FNAC of the liver has a significant role in diagnosis of palpable and non-palpable hepatic mass. It is a rapid, highly accurate, safe, and cost-effective diagnostic method which avoids invasive diagnostic procedures.

KEY WORDS: Ultrasound Guided Fine Needle Aspiration Cytology, Liver Mass, Hepatocellular Carcinoma

INTRODUCTION

Ultrasonography (USG) fine-needle aspiration cytology (FNAC) is an accurate method for arriving at a definite tissue diagnosis in focal liver lesions.[1] USG-guided FNA is an important diagnostic tool. It is a safe, simple, accurate, rapid, and an effective method for approaching a lesion which is deeply seated in the abdomen. FNAC can accurately differentiate between non-neoplastic and neoplastic lesions, categorize different non-neoplastic lesions, and differentiate primary from metastatic tumors, which is helpful for the management of hepatic lesions. The aim of the present study was to assess the utility of ultrasound-guided FNAC in the diagnosis of hepatic mass, to study the cytomorphological features of various liver lesions, and to categorize hepatic masses into benign and malignant lesions to assess the nature of mass.

Access this article online	
Website: http://www.ijmsph.com	Quick Response code
DOI: 10.5455/ijmsph.2019.1029117102018	

MATERIALS AND METHODS

The present study was conducted in the Department of Pathology, M.G.M. Medical College, Indore, between

January 2014 and April 2016. Ultrasound-guided FNAC was performed on 62 patients with hepatic mass lesions having normal prothrombin time. The patients with hemangioma and hydatid disease of the liver diagnosed by USG were excluded to prevent undue complications. The cytological material was obtained using 20- or 22-gauge spinal needle introduced into the lesion under ultrasound evaluation. The smears were stained by Papanicolaou stain and cytomorphological diagnoses were evaluated.

RESULTS

There were 39 (62.9%) males and 23 (37.09%) females with a mean age of 52.5 years ranging from 10 to 85 years. Samples were adequate in 57 (93.5%) and inadequate in 5 (6.5%). Of 57 adequate samples, five show inflammation, two were benign, and 50 were malignant. Of the inflammatory lesions, pyogenic liver abscesses in 3 (5.26%) and amoebic liver abscesses in 2 (3.51%). Benign lesion included hepatic adenoma in 2 (3.51%). Of the malignant lesions, metastatic adenocarcinomas was in 22 (38.60%), hepatocellular carcinomas was in 10 (17.54%), metastatic deposits of poorly differentiated carcinoma was in 10 (17.54%), metastatic squamous cell carcinoma was in 5 (8.78%), hepatoblastoma was in 2 (3.51%), and cholangiocarcinoma was in 1 (1.75%) case. All the hepatocellular carcinomas in our study occurred in males (4 of 4) [Tables 1-3].

Table 1: Disease-wise distribution of hepatic lesion

Diagnosis	Number of cases (%)
Pyogenic liver abscess	3 (5.26)
Amoebic liver abscess	2 (3.51)
Hepatic adenoma	2 (3.51)
Hepatocellular carcinoma	10 (17.54)
Hepatoblastoma	2 (3.51)
Cholangiocarcinoma	1 (1.75)
Metastatic deposits of adenocarcinoma	22 (38.60)
Metastatic deposits of squamous cell carcinoma	5 (8.78)
Metastatic deposits of poorly differentiated carcinoma	10 (17.54)
Total	57 (100)

Table 2: Gender-wise distribution of hepatic lesion

Gender	Number of cases (%)
Male	39 (62.91)
Female	23 (37.09)

Table 3: Distribution of benign, malignant, and non-neoplastic lesions of the liver

Type of lesion	Number of cases (%)
Inflammatory	5 (8.77)
Benign	2 (3.51)
Malignant	50 (87.72)
Total	57 (100)

DISCUSSION

In our study, malignant lesions 50 (87.72%) are the most common followed by inflammatory 5 (8.77%) and benign lesions 2 (3.51%).

Metastatic deposits 37 cases (64.92%) are the most common neoplastic lesions seen in the liver followed by hepatocellular carcinoma (17.54%). Similar studies were done by Smith and Butler[2] in which 66% were malignant lesions and 34% were benign/non-neoplastic lesions. Rani *et al*.,[3] Jha *et al*.,[4] Rasania *et al*.,[5] and Islam *et al*.[6] also performed the study which concluded the same result who found metastatic deposits in the liver to be the most common lesion.

Here, in our study, metastatic deposits of adenocarcinoma 22 (38.60%) were found to be the most common lesion among metastatic deposits. Similarly, metastatic adenocarcinoma was found to be the predominant lesion in other studies also.[3,7]

In this study, hepatocellular carcinoma was found to be 17.54%. Similar results are also found in the study done by Robins *et al*.,[8] Kinney,[9] and Ruchika *et al*.[10]

In our study, liver abscesses constituted 8.77% of the hepatic masses. This result corresponds to the study conducted by Ruchika *et al*.[10] and Adhikari *et al*.[7] and who found that liver abscesses constitute 2% of the total liver masses.

Hence, the study shows that the procedure provides the early diagnosis of hepatic lesions only by FNA of material under ultrasound guidance.

CONCLUSION

Ultrasound-guided FNAC of the liver has a significant role in diagnosis of palpable and non-palpable hepatic mass. It is a rapid, safe, simple, cost-effective, and highly accurate method to diagnose hepatic mass lesion. FNA is the diagnostic procedure of choice for focal hepatic masses. The cytomorphological evaluation by pathologist with a guided procedure performed with radiologist has been proven to be the better non-invasive procedure for such liver lesions. Early diagnosis by guided aspiration reduces the incidences of dreadful malignant liver masses. It can be done on an outpatient basis which involves minimal or no risks and complications.

REFERENCES

1. Das DK, Tripathi RP, Kumar N, Chachra KL, Sodhani P, Parkash S, *et al.* Role of guided fine needle aspiration cytology

in diagnosis and classification of liver malignancies. Trop Gastroenterol 1997;18:101-6.
2. Smith C, Butler JA. Efficacy of directed percutaneous fine-needle aspiration cytology in the diagnosis of intra-abdominal masses. Arch Surg 1988;123:820-4.
3. Rani GS, Faheem N, Prasad BS, Reddy ES. Efficiency of ultrasound guided aspiration cytology in deep seated lesions - A diagnostic evaluation. Int J Med Health Sci 2012;1:2-11.
4. Jha B, Shah B, Jitendra P. Effectiveness of image guided fine needle aspiration cytology in cases of deep seated lesions. Int J Med Sci Public Health 2013;2:2439-40.
5. Rasania A, Pandey CL, Joshi N. Evaluation of FNAC in diagnosis of hepatic lesion. J Cytol 2007;24:51-4.
6. Islam T, Hossain F, Rumpa AP, Sikder NH, Bhuiyan MA, Karim E, *et al.* Ultrasound guided fine needle aspiration cytology: A sensitive diagnostic tool for diagnosis of intra-abdominal lesions. Bangladesh Med Res Counc Bull 2013;39:14-7.
7. Adhikari RC, Tuladhar A, Shrestha S, Sharma SK. Deep-seated thoracic and abdominal lesions: Usefulness of ultrasound guided fine needle aspiration cytology, a 3 year experience. Nepal Med Coll J 2010;12:20-5.
8. Robins DB, Katz RL, Evans DB, Atkinson EN, Green L. Fine needle aspiration of the pancreas. In quest of accuracy. Acta Cytol 1995;39:1-0.
9. Kinney TB. "Diagnosis of abdominal malignancy by radiologic fine-needle aspiration biopsy" - a commentary. AJR Am J Roentgenol 2008;191:1649-51.
10. Ruchika SB, Hiremath ST, Prakash SK, Nidhi V, Juhi S. A study of fine needle aspiration cytology of intra-abdominal masses in and around Davangere, Karnataka. J Adv Res Biol Sci 2013;5:290-3.

How to cite this article: Likhar K, Shukla A, Kulkarni CV, Argal V. Ultrasound-guided fine-needle aspiration cytology of hepatic mass - A minimally invasive diagnostic approach. Int J Med Sci Public Health 2019;8(1):58-60.

Source of Support: Nil, **Conflict of Interest:** None declared.