

Study of image guided fine needle aspiration cytology in cases of hepatic mass lesions

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Abstract

Introduction: Ultrasound guided Fine needle aspiration cytology (FNAC) has been proved to be a very effective and rapid means of obtaining tissue from liver for pathological evaluation of benign, malignant and inflammatory hepatic lesions. **Aims and objectives:** The role of Fine needle aspiration cytology as a first line of investigation in space occupying lesions of liver and to study the various cytological patterns in hepatic lesions, categorizing them into non-neoplastic and neoplastic lesions. **Materials and Methods:** This was a prospective study comprising of 76 cases of liver lesions diagnosed clinically or radiologically. Abdominal ultrasonography was carried out in all cases. FNAC was performed under ultrasound guidance. Smears were stained with H & E (Hematoxyline & Eosin) and Wrights stain and were examined for detailed cytomorphological analysis. **Results:** Among 76 cases included in the study, cases of primary malignancy of liver (Hepatocellular carcinoma) were 45(59%), and metastatic carcinomas were 21(28%). Benign neoplastic lesions were total 4(5%) including hepatic adenoma 3cases and 1case of hemangioma. About 6 (8%) cases were found to be inflammatory lesions of liver. Hepatocellular carcinoma was most common diagnosis followed by liver metastasis of adenocarcinoma. Frequency of hepatic mass lesions was almost equal in both male (39 cases) and female (37 cases) being ratio of 1:1. **Conclusion:** Guided FNA is a first line of investigation in space occupying lesions of liver as the procedure is safe, simple, rapid, effective and can be employed for pathological evaluation of both malignant and non-malignant hepatic lesions. Malignant tumors were the commonest of the liver lesions with high incidences of primary and metastatic deposits. On radiological examination, neoplastic and nonneoplastic lesions show overlapping features, hence cytomorphological analysis by FNAC increases the diagnostic accuracy.

Key words: Guided FNAC, Liver, Hepatocellular carcinoma

Introduction

Liver is involved in many non-neoplastic and neoplastic diseases. As sonography alone has its limitations, cytomorphologic analysis by FNA is required to increase the diagnostic accuracy. Ultrasound guided FNA (Fine needle aspiration) of liver is safe, cheap and relatively noninvasive procedure with minimum complications [1].

The diagnosis and management of various hepatic mass lesions is a common clinical problem and their appropriate clinical management depends on accurate diagnosis. Liver disease is the third most common cause of death among individuals between age 25 and 59 years [2].

FNAC is a rapid, less invasive method that can be employed for pathological evaluation of both benign and malignant hepatic lesions. Inflammatory lesions and diffuse liver diseases may mimic mass like lesions in radiographs. Such lesions can also be sampled by FNA to rule out neoplasms and differentiate it from other diagnosis [3]. The aim of the present study was to categorize the lesions of liver in to inflammatory, non-neoplastic and neoplastic lesions by ultrasound guided fine needle aspiration cytology.

Material and Methods

This is a prospective study comprising of 76 cases of liver lesions diagnosed clinically or radiologically and referred to Department of Pathology, Chirayu Medical College and hospital, Bhopal, during a period between

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2016 to 2017 for cytological assessment. Investigations done before procedure were platelet count BT (Bleeding Time), CT (Clotting time) and plasma prothrombin time to know patient's with bleeding tendencies. Under ultrasonography guidance fine needle aspiration was performed on patients diagnosed for nodular or diffuse lesions of liver.

Materials used for the procedure were cotton and rectified spirit, disposable needles (22-Gauge), disposable Syringes, slides, diamond pencil, coplin jars with fixatives. Under aseptic precaution, during suspended respiration, the needle was introduced

percutaneously into the lesion under ultrasound guidance. One to three passes were made. When adequate material appeared in the needle hub, the needle was withdrawn after releasing the suction pressure.

Smears were made from aspirated material. Few slides were fixed immediately in 95% alcohol and stained with H & E (Hemotoxylin and eosin) and Papanicolaou. Air dried smears were prepared for Wrights Geimsa stain. Stained smears were examined under binocular light microscope for cytological features.

Result

A total of 76 cases were studied during this duration of 1 year. Patients age group ranged from 20 to 84 years with maximum cases lying between 40 to 80 years. Out of total 76 cases 39 male and 37 were female with male to female ratio being nearly equal.

The chief complaints were pain in right upper quadrant of abdomen, weight loss, anorexia, abdominal mass and hepatosplenomegaly. Some of the patients presented with fever, pruritus, jaundice, abdominal distention and ascites.

Table-1: Age wise distribution of liver lesions.

Age (Years)	Primary Malignancy of Liver (HCC)	Metastatic lesions of liver	Benign lesions of Liver	Inflammatory lesions of liver
0-20	-	-	-	1
21-40	7	2	-	2
41-60	20	11	2	-
61-80	18	8	2	3
Total	45	21	4	6

Table-2: Sex wise distribution of liver lesions.

Type of lesion	Male	Female	Total
Primary malignancy	30	15	45
Metastatic lesions	6	15	21
Benign lesions	1	3	4
Inflammatory lesions	2	4	6
Total	39	37	76

Table-3: Spectrum of lesions of liver aspirate (Total-76 cases).

S No	Type of lesion	Number of cases	Percentage %
1	Hepatocellular Ca	45	59
2	Metastasis of Adenocarcinoma	21	28
3	Hepatic adenoma	3	4
4	Hemangioma	1	1
5	Inflammatory	6	8

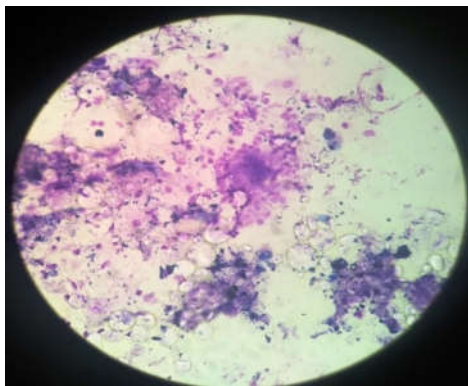


Figure 1: Malignant polygonal cells with intranuclear inclusion (Low power view)

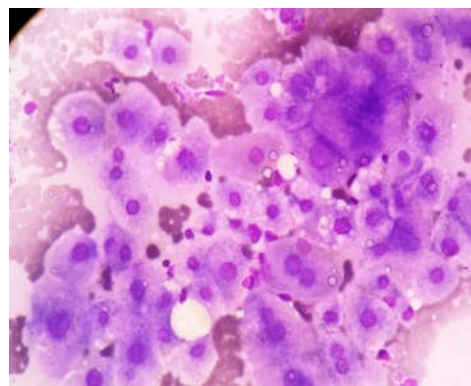
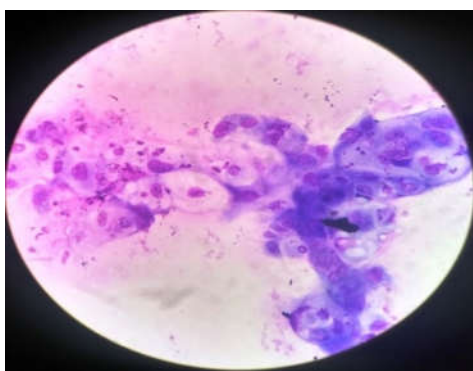


Figure 2: Malignant polygonal cells with intranuclear inclusion [High power view 400x]



Out of total 76 cases, 45 (59.2%) cases were of primary malignancy of liver and 21(27.6%) cases were of hepatic metastasis from the primary malignancy of other organs. Other 4 (5.2%) cases were benign and 6 (7.89%) cases were found to be inflammatory lesions of liver.

All primary malignant tumors were hepatocellular carcinoma where as all metastatic masses were of adenocarcinoma, On ultrasound examination, solitary space occupying lesions were seen in 49(64.5%) cases and remaining 27(35.5%) cases were multiple or multifocal.

Out of 4 benign neoplastic lesions 3 cases were of hepatic adenoma and one case was of haemangioma. In 6 infectious lesions 4 cases of pyogenic abscess and 2 cases of tubercular abscess were seen.

Discussion

Guided FNAC is useful in accurately distinguish non-neoplastic from neoplastic hepatic lesions and categorize neoplastic lesions in to primary or metastatic as concluded by Swamy *et al* [4].

Hepatic diseases are common entity. It affects all age groups with peak age in 5th and 6th decades of life [5]. In the present study patient's age ranged from 20-84 years with mean age of 54 years similar to Franca *et al* [6].

Zawar MP *et al* [7] and Shamshad *et al* [8] found that the incidence of malignancy increased after the age of 40 years in males and after the age of 30 years in females with a peak incidence between the ages of 40-60 years.

The most common organ which was involved in their study was the liver; In a study by Whitlach *et al* [9] and Wilson *et al* [10] Maximum number of guided aspiration were from liver showed 74 adequate smears for interpretation, out of which 27 were hepatocellular carcinoma, 29 were secondary metastasis, 1 was hepatoblastoma, 1 was hydatid cyst and 2 were liver abscesses. Remaining 14 were undifferentiated malignancy. Metastatic adenocarcinoma was commonest malignancy in secondary metastasis.

In this study FNAC results revealed predominantly malignant lesions (87%) of which 59.2% cases were of primary malignancy of liver and 27.6% cases were of hepatic metastasis from the primary malignancy of

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other organs. This is in accordance with the previous reports of similar ratio in neoplastic/non-neoplastic pathologies presenting as focal mass lesions in the liver by Hassan *et al*[11]. Similarly, malignant lesions outnumbering benign ones were also reported by Sheikh *et al* [12], Sidhaling Reddy *et al* [13], Sumana BS *et al* [14].

Liver was the common sites for FNAC in this study similar to those of Tuladhar AS *et al* [15], Adhikari RC *et al* [16], and J Nobrega *et al* [17], In the liver, the most common malignant lesion was metastatic carcinoma.

The chief complaints of the patients were vague abdominal pain, majority of them presented with right upper quadrant pain, fatigue, weight loss, anorexia, mass per abdomen and hepatomegaly. The appropriate management of various hepatic lesions depends on accurate diagnosis [18].

High prevalence of Hepatitis B and C in Indian population, may be the reason for higher figure for malignant lesions. Other entities associated with the development of hepatocellular carcinoma include chemical carcinogens, mycotoxins, thorotrast, alpha-1-antitrypsin deficiency, hemochromatosis, and long term anabolic steroid abuse. Lower rate of benign lesions in this series could be due to specific inclusion criteria.

Among the malignant lesions FNAC is also helpful to distinguish between primary liver malignancy and metastatic lesions as the treatment modalities differ completely. The fear of major complications in FNAC of liver lesions were suspected vascular lesions and marked hemorrhage. During this study no complications were encountered.

Lundqvist and other authors have reported complications like fatal bleeding in a case of chronic liver disease, needle tract tumor seedling, biliary-venous fistula and intrahepatic hematoma, in Fine needle aspiration biopsies of the liver [19, 20].

Hepatocellular carcinoma was only primary liver malignancy in our study. Cytosmears showed malignant cell as polygonal with irregular nuclear contours and single or multiple macronucleoli, abundant eosinophilic granular cytoplasm. Intranuclear cytoplasmic inclusions and bile plugging were seen.

Cohen *et al.* concluded that the most important helpful cytological features were trabecular pattern, irregular granular chromatin, multiple nucleoli and atypical stripped nuclei which was similar to our study [21]. The atypical naked nuclei were included as one of the

important criteria for the diagnosis of HCC by Pedio *et al.* as these were rarely seen in benign and metastatic conditions [22]. In present study most frequent secondary hepatic tumor were metastatic adenocarcinomas also observed by Swami MC *et al*[4]. Metastatic lesions of adenocarcinoma showed glandular or acinar pattern, intra and extra cytoplasmic mucin. These tumours mainly came from the GIT, breast, ovary and prostate.

Conclusion

Guided FNA is a first line of investigation in space occupying lesions of liver as the procedure is safe, simple, rapid, effective and can be employed for pathological evaluation of both malignant and non malignant hepatic lesions.

Malignant tumors were the commonest of the liver lesions with high incidences of primary and metastatic deposits. On radiological examination, neoplastic and nonneoplastic lesions show overlapping features, hence image guided cytomorphological analysis by FNAC increases the diagnostic accuracy.

Contribution by authors

- Dr Nilima and Dr Nipun conceived the idea and design of the study.
- Dr Nipun made the questionnaire and collected the data. Data interpretation and analysis was performed by Dr G K Sawke. Dr Nilima prepared the initial draft and manuscript. Consensus of all authors was reached in finalization of draft for publication.

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