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Original Research Article

A Study of Fine Needle Aspiration Cytology of Hepatic Mass Lesions Using Image Method for Guidance

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Abstract

Background: The correct clinical care of diverse hepatic mass lesions depends on precise diagnosis, which is a common clinical challenge. A quick, accurate, and affordable technique for identifying hepatic mass lesions is image guided FNAC.

Methods: To assess the role of image guided fine needle aspiration cytology (FNAC) in hepatic mass lesions, a retrospective study was conducted. From September 2020 to August 2021, the Department of Pathology at PMCH, Patna, Bihar, performed 52 image-guided FNACs of hepatic mass lesions. Leishman stain and Haematoxylin and Eosin (H&E) were used to colour the wet fixed and air dried smears, respectively.

Results: 42 (80.76%) of the 52 instances included in the study were malignant, 5 (9.51%) were benign, and 5 (9.51%) were insufficient for an opinion. Hepatocellular carcinoma and metastatic adenocarcinoma were the two most frequent diagnoses in 22 (52.38%) of the patients. Males made up 31(59.61%) of the hepatic mass lesions, which were more frequent. 61% of hepatocellular carcinoma cases tested positive for HBsAg. Ultrasonography (USG) guidance was used in 48 (92.30%) more cases than CT guidance was used in 4 (7.69%).

Conclusion: Patients were given the appropriate care by the doctors based on the diagnosis of USG guided FNAC of liver lesions and other investigations. Due to the procedure's ease, safety, low invasiveness, and OPD-based design, image guided FNAC is incredibly helpful in determining the diagnosis of hepatic mass lesions. As long as the patient was observed for two to three hours after FNAC and had a prior prothrombin time, there were no issues.

Keywords: Haematoxylin and Eosin (H&E), Leishman stain, Adenocarcinoma, USG, FNAC

Introduction

Numerous neoplastic and non-neoplastic illnesses involve the liver. The correct clinical care of diverse hepatic mass lesions depends on precise diagnosis, which is a common clinical challenge. When it comes to causes of death for those between the ages of 25 and 59, liver illness ranks third. Primary liver tumours (benign and malignant), metastatic deposits, congenital and acquired cysts, abscesses, and

granulomas are among the differential diagnoses for hepatic mass lesions.

The most recent and widely used method for diagnosing lesions with the use of imaging guidance is fine needle aspiration cytology, which is quickly replacing traditional first investigations for a variety of hepatic abnormalities. In the majority of patients, it offers a conclusive diagnosis at a reasonable cost and with little damage.

The purpose of the current study was to examine the diagnostic efficacy of image-guided FNAC in the diagnosis of liver illnesses and to describe the cytomorphological characteristics of distinct liver lesions with their clinical correlate [1,2].

Material and Methods

The total number of 52 image guided FNAC of hepatic mass lesions were performed in Department of pathology, Patna Medical College and Hospital, Patna, Bihar from September 2020 to August 2021. A thorough clinical history was taken, including information on the patient's symptoms, past liver conditions, personal and family history, any previous cancers that were found, background cirrhosis, bile canalicular parameters (LFT, HBsAg, HCV), and tumour markers (AFP, CEA, CA-125). Each patient's prothrombin time and bleeding time were assessed right before the surgery.

The treatment was carried out according to standard procedure utilising a 10ml syringe and a 22-gauge lumbar puncture needle. Atropine, an anti-cholinergic medication, was administered just prior to the surgery. Antiseptic was used to disinfect the area before a needle was percutaneously inserted into the hepatic lesion while suspended breathing and under imaging guidance. Smears were then prepared from the aspirated material and stained with H&E and leishman stains.

Results

Table 1: Distribution of liver aspirates

Aspirates	No. of cases	Percentage
Benign aspirates with 1 case of liver abscess	5	9.61%
Malignant aspirates	42	80.76%
Inadequate aspirates	5	9.61%
Total	52	100%

Table 2: Different types of malignant tumours diagnosed in liver on image guided FNAC in this study

Malignant lesions	No. of cases	Percentage
Metastatic adenocarcinoma	24	57.14%
Hepatocellular carcinoma	15	35.71%
Spindle cell tumor S/O GIST	2	4.76%
MPN-U	1	2.36%
Total	42	100%

Table 3: Different grades of hepatocellular carcinoma

Grade of HCC	No. of cases	Percentage
Grade I : Well differentiated	2	13.33%
Grade II : Moderately differentiated	9	60%
Grade III : Poorly differentiated	4	26.67%
Total	15	100%

Table 4: Distribution of cases as per image guidance

Imaging Method	No. of cases	Percentage
USG	48	92.30%
CT	4	7.69%

Table 5: HbsAg Positivity in HCC

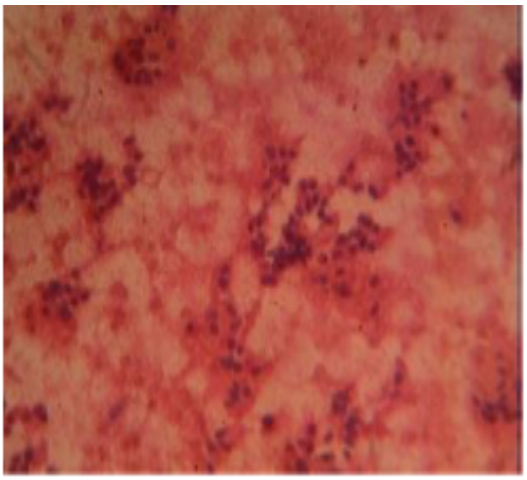
HbsAg	No. of cases	Percentage
Positive	9	60%
Negative	6	40%
Total	15	100%

Table 6: Alcohol consumption in HCC cases

	No. of cases	Percentage
Alcoholic	5	33.33%
Non-alcoholic	10	66.67%
Total	15	100%

Table 7: AFP correlation with Hepatic mass lesions

Grade of HCC	AFP Levels available	High Level	Normal Levels
Grade I	2	1(50%)	1(50%)
Grade II	8	5(62.5%)	3(37.5%)
Grade III	4	3(75%)	1(25%)
Total	14	9(64.28%)	5(35.72%)



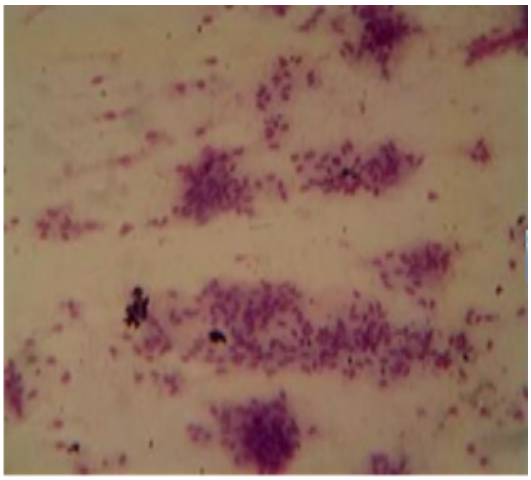


Figure 1: Acinar pattern of malignant cells S/O metastatic adenocarcinoma (H&E,100X)
Figure 2: Numerous clusters of spindeloid cells in case s/o GIST (H&E,1000x)

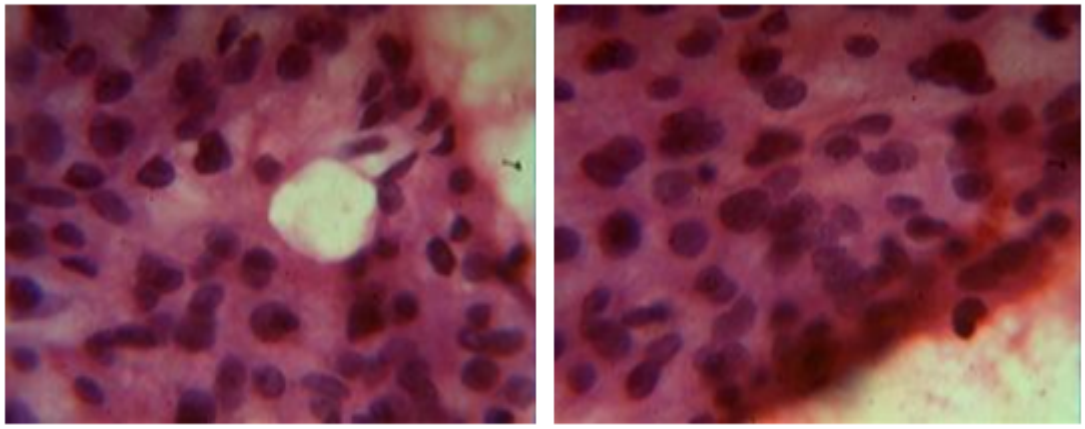


Figure 3 A & B: Sheets of carcinoma cells traversed as well as lined by endothelial cells suggestive of Hepatocellular carcinoma (HCC) (H&E,100x)

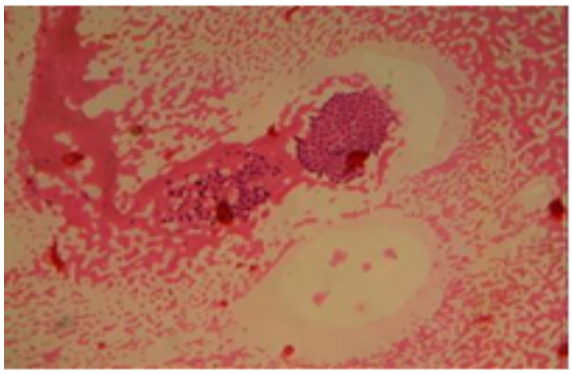


Figure 4: Cluster of immature myeloid cells seen on FNAC (H&E,100x)

52 cases of image-guided FNAC of liver lesions were done and examined; 47 cases (90.38%) had conclusive results. Studies by Rasania A. *et al*. and Ho CS *et al*. produced results that were essentially identical [3,4].

Table provides the distribution of liver aspirates.

9.61% of the aspirates were benign, 80.76% were malignant, and 9.61% were non-representative samples because they only contained a few scattered hepatocytes and blood.

Among the malignant liver lesions, metastatic tumours made up 27 (64.29%) of the cases. Adenocarcinoma was among the several metastatic lesions, accounting for 22 (52.38%).

Myeloproliferative lesion unclassifiable 1 (2.38%), which is comparable to research by Rasania A. *et al* [3]. Gastrointestinal stromal tumours (GIST) 2 (4.76%). Hepatocellular carcinoma (35.71%) was the most prevalent primary hepatic lesion, and it was distinguished from benign disorders such liver abscess (1.92%). Hepatocellular carcinoma was further classified into three categories: grade I (13.33%), grade II (60%) and grade III (26.67%). These grades were comparable to those used by Rasania A. *et al* [3].

Under USG guideline 48 (92.30%), the FNAC procedures were completed in large part. Nine cases (or 60%) of HCC cases had HBs Ag positive. Five cases (30%) involved alcohol use. 35 of the 52 instances of hepatic mass lesions had AFP levels accessible, and

14 of the 15 cases of HCC had AFP levels performed. More students in higher grades had greater levels, which is comparable to Swamy MCM *et al* [5].

Discussion

FNAC is a very helpful procedure, especially for diagnosing localised lesions. When used in conjunction with imaging guidance, its usefulness is increased even more. Because bleeding diathesis is the only known contraindication to FNAC for hepatic mass lesions, patients were checked for any abnormal bleeding by having their bleeding time and clotting time measured.

Hepatic mass lesions are well known for their clinical appearance. The patient's primary complaints were pain in the right hypochondrium of the abdomen, loss of weight, anorexia, and a small number of cases of palpable abdominal mass.

To categorise hepatocellular carcinomas into grades I, II, and III, we investigated and assessed several characteristics in various lesions as stated by Ali *et al*. and Tau *et al*. [2,6]. Cellular organisation, cell size, N/C ratio, cohesiveness of cells, nuclear form, size, location, multinucleation, conspicuous nucleolus, amount of cytoplasm, vacuolation, and bile production were the cytomorphological characteristics.

Since primary hepatocellular carcinoma and metastatic adenocarcinoma have entirely different treatment approaches, this distinction must be made.

Although FNAC is dependable for this separation, it can be challenging to distinguish poorly differentiated hepatocellular carcinoma from metastatic adenocarcinoma in a small number of instances. Metastatic adenocarcinoma displayed intra and extracytoplasmic mucin, as well as a glandular or acinar pattern. The GIT, gall bladder, breast, and prostrate were where these cancers mostly originated.

One instance of a hepatic abscess was reported, and an ultrasound showed a localised mass lesion in the right lobe of the liver along with a high grade temperature and pain in the right upper quadrant.

According to the results of the FNAC, which showed a lot of polymorphonuclear cells, a hepatic abscess was diagnosed, and the remaining aspirated material was submitted for microbial culture. It was isolated E. coli. In our analysis, we found two cases of metastatic GIST, one of which originated in the stomach. IHC confirmed the initial GIST diagnosis (CD117 positivity).

Numerous spindle cells were seen in sheets, clusters, and scattered single positions in FNAC aspirates. Myeloproliferative lesion with metastatic spread was detected in one case. Primary diagnosis of MPN-Unclassifiable was made as a result of haematological studies and a bone marrow examination that did not fit into a conventional myeloproliferative lesion.

It was challenging to distinguish between primary liver cancer and metastatic adenocarcinoma in two patients. The result was a diagnosis of merely positive for cancer cells. Smears in 4 cases only showed hemorrhagic material, making diagnosis impossible. Applying statistical tests, or the test of significance, the P value for diagnosed cases versus inadequate for opinion in the overall FNAC diagnosis was 0.001 ($p < 0.05$).

Conclusion

FNAC is a very useful diagnostic technique for hepatic mass lesions. As a result, we can use image-guided FNAC as a diagnostic tool for hepatic mass lesions in a peripheral health setting. It is a cost-efficient, cost-safe, OPD-based tool. Although image guided FNAC is very useful tool to diagnose hepatic mass lesion but sometimes it is difficult to differentiate HCC from

metastatic adenocarcinoma on FNAC, so certain cytological features that help us in between two are hepatocytes which are polygonal cells having eosinophilic granular cytoplasm containing intracellular bile pigment arranged in trabecular pattern along with stripped nuclei lying in the background.

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