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Corresponding Author
Sarojini Naidu Tamanara, Department of Pathology, GSL Medical College, Rajamahendravaram, Andhra Pradesh, India

Author Designation
[1,2]Assistant Professor
[3]Professor and Head

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Fine Needle Aspiration Cytology of Liver Lesions

[1]Sarojini Naidu Tamanara, [2]Manikanta Swamy Marisetty and [3]Thurlapati Satya Prakash Venkatachalam
[1-3]Department of Pathology, GSL Medical College, Rajamahendravaram, Andhra Pradesh, India

ABSTRACT
In Indians, liver disease has been found to be as frequent that it may affect every one out of 5 Indians. As per the World Health Organization, liver disease is the tenth most common cause of death in India and Cirrhosis of the liver being the leader. The diagnosis of lesions in liver is always challenging especially when they are in multiple lesions in locations. Ultrasonography (USG) guided FNAC has been found to further improved the accurate method in obtaining definitive diagnosis especially in focal liver lesions in evaluating various neoplastic lesions, whether primary, metastatic or non-neoplastic conditions of liver. Even though clinical, radiological and serological investigations help in arriving diagnosis, tissue diagnosis is considered ultimate gold standard and final in the diagnosis and management of these cases. The consent of the patient was before under taking the procedure. During the study period, a total number of 93 cases were studied. Study was performed on admitted and OP and IP patients in whom hepatic mass was confirmed by radiological examination. All cases where lesion/pathology in the liver were suspected cases were taken for study Cytological smears that were opined as moderately differentiated HCC also had many overlapping features of WDHCC. It was found that endothelial rimming or transgressing of cell clusters, eccentric nuclei, multi-nucleation and macro-nucleoli were more associated with this type of HCC.

INTRODUCTION

Liver, also called as the Power house is one of the most vital organs of the body. Like any other organ, liver is also not immune to diseases. Liver diseases can be due to many etiological factors they being, genetic, environmental mainly infective, metabolic, autoimmune and neoplastic[1].

In Indians, liver disease has been found to be as frequent that it may affect every one out of 5 Indians. As per the World Health Organization, liver disease is the tenth most common cause of death in India and Cirrhosis of the liver being the leader. At present, Cirrhosis of the liver is the 14th leading cause of death worldwide and by 2020, it may ascend the ladder to occupy 12th position as the leading cause of death in the world[2].

Earlier Hepatitis B and C were the common etiologies for liver diseases but now they have been overthrown and alcohol induced liver diseases and obesity related disorders have taken over. There is a paradigm shift in the dynamics of liver cirrhosis and carcinomas in the recent past so much so, that 10 lakh patients are diagnosed with these two conditions every year in India[3].

When it comes to neoplastic lesions as cause of death in adults, Hepatocellular carcinoma or metastases to the liver from elsewhere have been found to be the second most common cause of death due to malignancy. In the pediatric age group, two-thirds of primary liver tumors are malignant and they account for 1-2% of all childhood cancers[1]. The remaining third are benign lesions and among them tumors of vascular origin are the most common (e.g., hemangiomas)[4].

Diseases of liver can be broadly categorized into diffuse parenchymal disorders and focal discrete hepatic masses such as cysts, abscesses and benign or malignant tumors. The evaluation and management of discrete hepatic masses is a common clinical problem. Malignancy in the liver either primary or metastatic is usually detected very late and inoperable at time of diagnosis and as such, portends an ominous prognosis[5].

FNAC, under guidance of ultrasound or computed tomography (CT) scan, though useful in the diagnosis of benign, malignant and in ammatory hepatic lesions with low risk of complications but major cytological diagnostic issues arise in diagnosing benign hepatocellular lesions, differentiating between reactive hepatocytes and well-differentiated hepatocellular carcinoma (WD-HCC) cells, poorly differentiated HCC (PD-HCC), cholangiocarcinoma, metastatic carcinomas and determination of primary site of metastatic tumor. These overlapping features can restrain and compel the Pathologist to issue inconclusive reports on FNAC[6].

MATERIALS AND METHODS

Sample Size: During the study period, a total number of 93 cases were studied. Study was performed on admitted and OP and IP patients in whom hepatic mass was confirmed by radiological examination. All cases where lesion/pathology in the liver were suspected cases were taken for study.

Sample Selection: All cases where lesion/pathology in the liver was suspected cases were selected for study.

Type of Study: A Hospital based cross sectional study.

Inclusion Criteria:

- All the diagnosed patients with liver mass lesions who have consented to undergo image guided FNAC or FNAB for pathological evaluation were included.

Exclusion Criteria:

- Patients having contraindications like deranged coagulation profile FNAC/FNAB were excluded.
- FNAC or FNAB having insufficient material for interpretation were excluded.

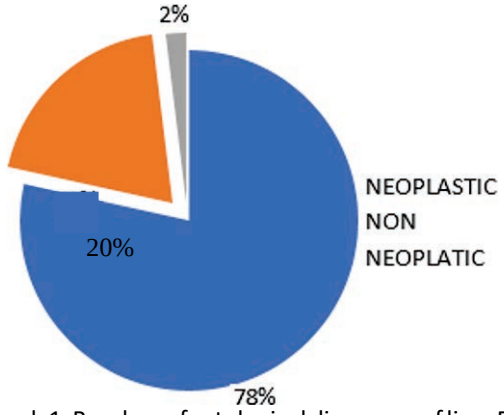
After obtaining the detailed clinical and radiological data, the patient was subjected to FNAC/FNAB under Ultrasound or CT guidance. The consent of the patient was taken before under taking the procedure.

RESULTS AND DISCUSSIONS

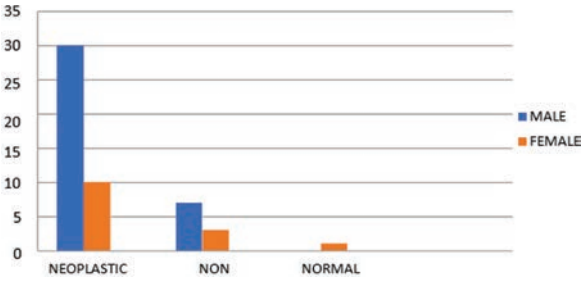
Out of 51 cases which were subjected to FNAC, 10 cases were opined as non-neoplastic and 40 cases were diagnosed as neoplastic respectively. 01 case was opined as normal liver cytology. The present study encountered 10 cases (19.2%) of non-neoplastic lesions out of 51 cases by FNAC.

One case cytologically was diagnosed as granulomatous lesions. Both the patients had moderate hepatomegaly. Ultrasound showed diffuse parenchymal lesion. FNAC smears were moderately cellular and showed epithelioid cell granulomas and occasional multinucleated giant cell. The hepatocytes were arranged in vague acinar pattern on a necrotic background.

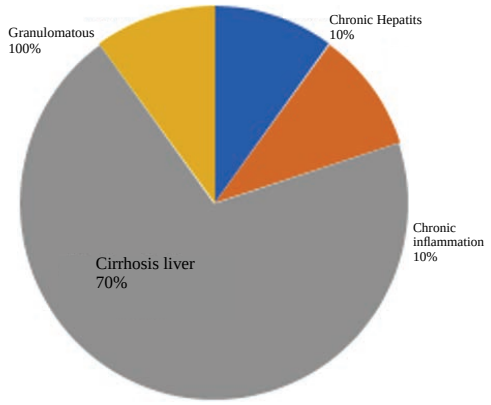
One case cytologically was diagnosed as chronic hepatitis. In the former, ultrasound showed ill-defined lesion measuring 3.5x3.0 cms and in the latter case, ultrasound show ill-defined lesion measuring 4.0x4.5 cm. The smears showed many regenerative hepatocytes characterized by anisokaryosis with bi and multi nucleation. Some hepatocytes showed microvesicular steatosis and some showed nuclear vacuolation. In section of liver biopsy micro vesicular steatosis and feathery degeneration of the hepatocytes with lymphocytic infiltration was seen.



Graph 1: Breakup of cytological diagnoses of liver FNAC



Graph 2: Sex wise distribution of benign and malignant lesions of liver by FNAC



Graph 3: Distribution of non-neoplastic lesions of FNAC

Table 1: Lesion wise break up of FNAC's on 51 liver SOL's

Diagnosis	No of cases	Percentage
Normal	01	02 %
Non neoplastic	10	19.6 %
Chronic inflammation	01	10 %
Cirrhosis	07	70 %
Granulomatous lesion	01	10 %
Chronic hepatitis	01	10 %
Neoplastic	40	78.4 %
Hepatocellular carcinoma	27	67.5 %
Metastatic adenocarcinoma	11	30 %
Metastatic squamous cell carcinoma	01	2.5 %
Total	51	100

Table 2: Cytological diagnosis of neoplastic liver lesions by FNAC

Neoplastic lesions	Number of cases	Percentage
Primary (HCC)	27	67%
Well differentiated	11	42.85%
Moderately differentiated	10	35.71%
Poorly differentiated	06	21.44%
Secondary deposits	13	33%
Metastatic adenocarcinoma	12	91.66%
Metastatic squamous cell carcinoma	01	8.34%

Table 3: Comparison of cytological diagnoses of present study with others

Cytological diagnosis	Rossenbaltt *et al* [7]. (n=59)	Lekha *et al* [8]. (n=60)	Present study (n=51)
Normal liver morphology	-	-	1 (2%)
Non-neoplastic lesions	11(18.6%)	6 (10%)	10 (19.6%)
a. Abscess	3 (5.08%)	5(8.33%)	-
b. Cirrhosis	2 (3.3%)	-	7 (70%)
c. Fatty change	2 (3.3%)	-	-
d. Chronic hepatitis	-	-	1(10%)
e. Granulomatous lesion	-	1(1.66%)	1 (10%)
f. Cysts	1 (1.69%)	-	-
g. Fibrosis	1 (1.69%)	-	-
h. Clinical course benign., no lesion found	2 (3.3%)	-	-
i. Chronic inflammation	-	-	1 (10%)
Neoplastic lesions	48 (81.35%)	53 (88.33%)	40 (78.4%)
A. Benign			
a. Hemangioma	1 (1.69%)	-	-
B. Malignant	47 (79.66%)	53 (88.13%)	40 (78.4%)
a. Hepatocellular carcinoma	5 (8.47%)	21 (35%)	27 (67.5%)
b. Metastatic Tumours/carcinomas	42 (71.18%)	21 (35%)	13 (32.5%)
d. Metastatic poorly differentiated carcinoma	-	6 (10%)	-
e. Unclassified malignancy	-	5(8.33%)	-
C. Suspicious of carcinoma		1(1.66%)	-

Cytological smears from well differentiated HCCs showed round to polygonal cells having scanty pale basophilic/eosinophilic cytoplasm and a large round to oval nuclei with high N:C ratio and many showing 1 to 3 prominent nucleoli. Some of the nucleoli appeared like inclusions. Background showed many discretely scattered bare dysplastic nuclei. Occasional tumor cell nests showed intracytoplasmic bile pigment.

Cytological smears that were opined as moderately differentiated HCC also had many overlapping features of WDHCC. It was found that endothelial rimming or transgressing of cell clusters, eccentric nuclei, multinucleation and macronucleoli were more associated with this type of HCC. Many atypical naked nuclei with prominent nucleoli were also present. Rosenblatt[7] performed 59 liver fine needle aspirations. The material of their study included 11 non-neoplastic lesions (18.6%) that included 3 abscesses, 2 cases of fatty change and cirrhosis each, 1 case each of hepatic fibrosis and hepatic cyst.

In 2 Cases no Lesions were Found: In the present study, out of 51 cases, there were 10 (10%) cases of non-neoplastic lesions that included 4 cases of cirrhosis, 1 cases of granulomatous lesion, 1 case of chronic hepatitis, 1 case of chronic inflammation, 3 cases of regenerative nodules. Though Rosenblatt[8] encountered one case of benign tumor (hemangioma), in the present study no benign tumours were found[9]. There were 47 malignant tumors in 59 FNACs done in Rosenblatt et al. study which comprised of 5 (8.47%) cases of HCCs and 47 (71.8%) cases of metastatic carcinomas. In present study, 40 out of 51 FNACs were found to be malignant tumors out of which there were 27 (67.5%) cases of primaries all being HCCs and 13

(32.5%) cases of secondaries, 12 (30%) being metastatic adenocarcinomatous tumors and 1 (2.5 %) case being metastatic squamous cell carcinoma. In our study primary liver tumours were found to be more common than the secondaries[10].

CONCLUSION

51 cases that had undergone FNAC were categorized into Non-neoplastic lesions 10 (20%) and malignant neoplastic lesions 40 (78%). One (2%) case as opined as showing normal liver morphology. FNAC of liver permits the categorization of more frequent non-neoplastic lesions and neoplastic primary and secondary metastatic malignancies in a simple and rational manner which is helpful for the management of hepatic lesions.

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