

# Evaluation of FNAC in Diagnosis of Hepatic Lesion

Rasania A\*, Pandey CL<sup>+</sup>, Joshi N<sup>#</sup>

## Abstract

The fine needle aspiration cytology (FNAC) of liver was performed on 90 cases. The diagnostic yield was 83.4%. The main indication of FNAC was hepatomegaly with abnormal ultrasonographic (USG) / computed tomographic (CT) findings. The USG guided FNA was very helpful in making cytological diagnosis of hepatic masses in 90% of cases. Among the hepatic lesions 23.3% were benign, 67.7% were malignant, 6.6% were non-representative and 2.2% were suspicious of malignancy. Metastatic tumours were the most common and constituted 70.4% while the hepatocellular carcinoma accounted for 26.2% of malignant liver lesions.

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**Key Words :** Fine needle aspiration cytology, hepatocellular carcinoma, metastatic.

## Introduction

The main indication of fine needle aspiration cytology (FNAC) of liver are single or multiple nodular lesions, demonstrated by palpation, nuclear scan, CT or USG (computed tomography and ultrasonography). The purpose of the study was to evaluate various neoplastic lesions whether primary, metastatic or non-neoplastic conditions of the liver and to correlate with histopathology whenever possible.

We also compared and standardized the cytomorphological features of various types and grades of hepatocellular carcinoma, cirrhosis, other benign and metastatic lesions.

## Materials and Methods

A total of ninety cases presented with liver lesions diagnosed clinically or radiologically, with normal range of prothrombin time index were subjected to FNAC. The standard technique was applied using 22-gauge needle or long spinal needle attached to 10 ml disposable syringe. The area was cleaned with the antiseptic and during suspended respiration; needle was introduced percutaneously into the lesion evaluated by USG. At least six smears were made from aspirated material, two of these were immediately fixed in 95% ethanol for 15 minutes and then stained by routine Hematoxylin and Eosin (H&E) stain, other two dry smears were stained by May-

Grünwald Giemsa (MGG) stain. Periodic-acid-Schiff (PAS), mucicarmine (MC) and Hall's stain were done where needed.

## Observations

FNAC of liver was performed on 90 cases and studied. It was conclusive in 84 cases. The diagnostic yield was 83.4%; almost similar results were seen in the earlier studies.<sup>1,2</sup> The distribution of liver aspirates are given in the Table 1.

Out of total aspirates 23.3% (21 cases) were benign, 67.7% (61) were malignant, 6.6% (6) were non-representative, as it contained only few scattered hepatocytes and blood while 2.2% (2) were suspicious of malignancy as they had few degenerated atypical cells in the necro-inflammatory background.<sup>1,3</sup>

Metastatic tumours were the most common among the malignant liver lesions and constituted 70.4%. The different types of metastatic lesions were,

**Table 1 : Distribution of liver aspirates**

S. No.	Liver aspirates	No. of cases	Percent
1.	Benign aspirates	21	23.33
2.	Malignant aspirates	61	67.77
3.	Suspicious of malignancy	02	2.23
4.	Non representative	06	6.67
	Total	90	100.00

\*Senior Demonstrator; <sup>+</sup>Ex-Professor & Head; <sup>#</sup>Professor, Department. of Pathology, S.M.S. Medical College, Jaipur.

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**Reprint requests:** Dr. Akta Rasania, C/o Dr. Y.K. Rasania, 439, Gumanpura, Kota-7 (Rajasthan).

adenocarcinoma (NOS) 86% (Fig. 3), squamous cell carcinoma 2% (Fig. 5), while the round cell neoplasm (Fig. 4), ovarian, renal & small cell carcinoma lung, each were 2.3% (Table 2).

The commonest primary hepatic lesion was hepatocellular carcinoma (HCC) (26.2%). It was differentiated from benign conditions like normal liver aspirates and abscess (7.3%), inflammatory (4.8%) (Fig. 1), cirrhotic (Fig. 2)/ parenchymal disease of liver (2.4%) and regenerative nodule (1.2%) (Table 3).

The hepatocellular carcinoma was further differentiated into 3 grades. Grade I - 12.5% (Fig. 6), Grade II - 56.2% (Fig. 7) and Grade III - 31.2% (Fig. 8) (Table 4). The intracellular bile was demonstrated by the Hall's stain, similar results were observed by Ali et al and Shridhar et al.<sup>4,5</sup>

**Table 2 : Different types of metastatic tumours**

S. No.	Types	No. of cases	Percent
1.	Adenocarcinoma (NOS)	37	86.04
2.	Squamous cell carcinoma	2	4.68
3.	From ovary	1	2.32
4.	From kidney	1	2.32
5.	Round cell neoplasm	1	2.32
6.	Small cell carcinoma, Lung	1	2.32

**Table 3 : Incidence of various types of benign and malignant liver aspirates**

S. No.	Hepatic Lesion	No. of cases	Percent
A.	Benign		
1.	Normal liver	6	7.34
2.	Cirrhosis	2	2.44
3.	Inflammatory	4	4.88
4.	Abscess	6	7.34
5.	Parenchymal disease of liver	2	2.44
6.	Regenerative nodule	1	1.22
B.	Malignant		
1.	Metastatic carcinoma	43	52.40
2.	Primary liver carcinoma		
a.	H.C.C.	16	19.50
b.	Hepatoblastoma	2	2.44
	Total	82	100.00

**Table 4 : Different grades of hepatocellular carcinoma**

Grade	No. of cases	Percent
Grade I		
Well differentiated	2	12.50
Grade II		
Moderately differentiated	9	56.25
Grade III		
Poorly differentiated	5	31.25

The primary lesion in the pediatric age was hepatoblastoma and a single case was encountered in this study (Fig. 9).

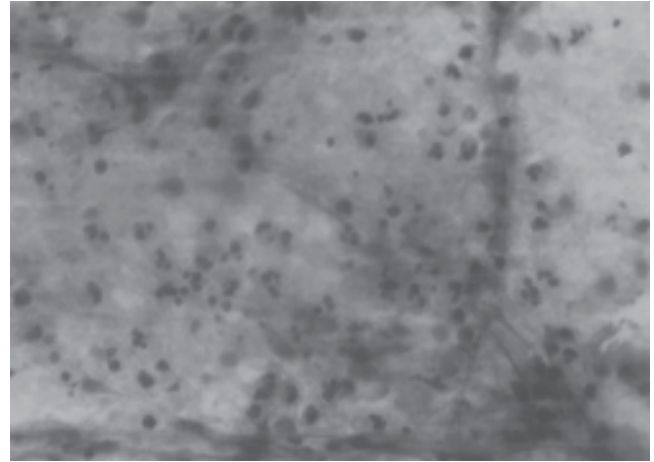


Fig. 1 : Inflammatory lesion - cellular smear showing inflammatory debris and degenerating hepatocytes (MGG, x 400).

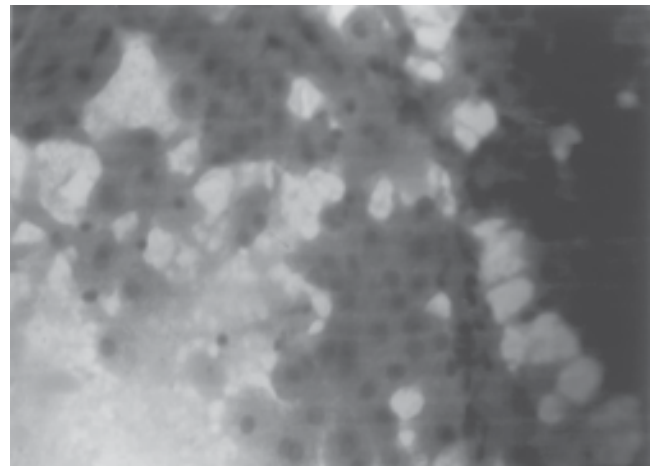


Fig. 2 : Cirrhosis - poorly cohesive hepatocytes with regenerative features and Kupffer cells (H&E, x400).

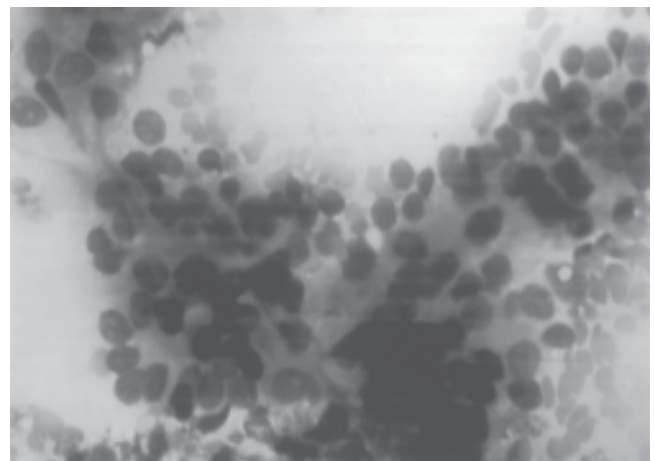


Fig. 3 : Metastatic adenocarcinoma - showing a well formed gland or acini (MGG, x 400).

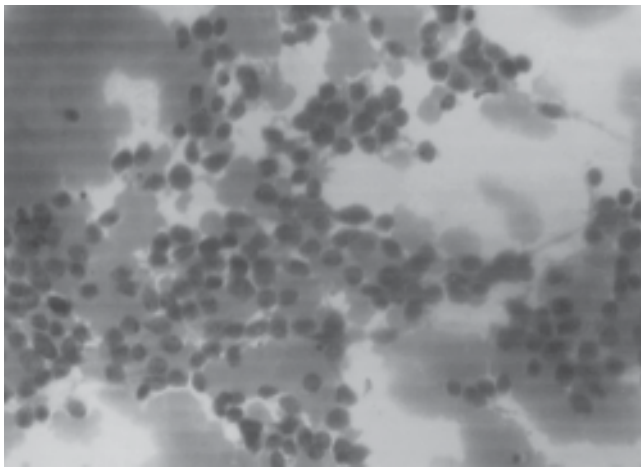


Fig. 4 : Metastatic round cell tumour - monomorphic cells with scanty cytoplasm and finely granular chromatin (H&E, x 400).

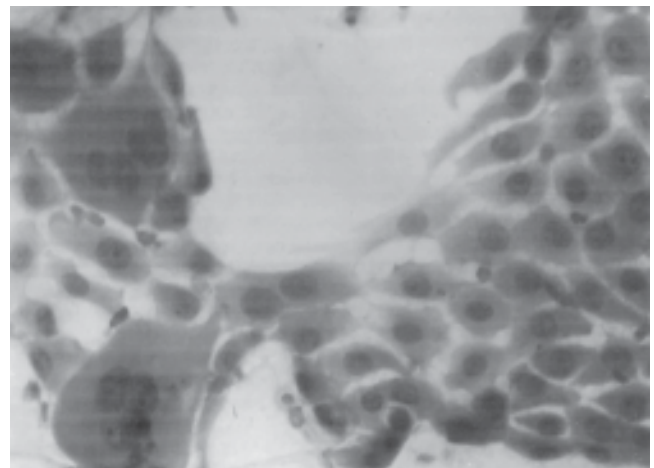


Fig. 7 : Moderately differentiated HCC - cells with high N/C ratio, many lying singly and loosely grouped monotonous cells with two multinucleated giant cells (H&E, x 400).

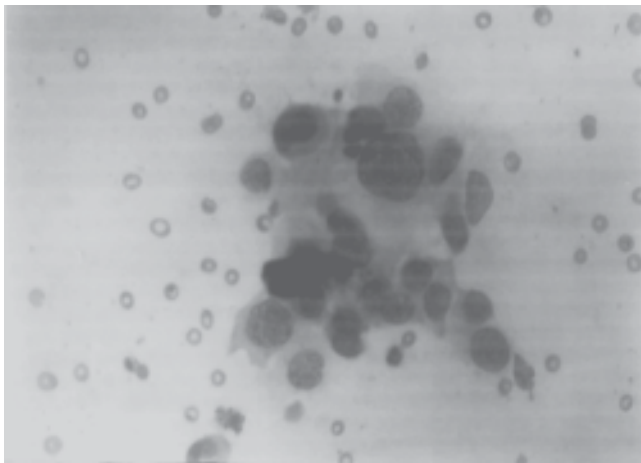


Fig. 5 : Metastatic squamous cell carcinoma - large pleomorphic squamous cells in syncytial pattern (MGG, x 400).

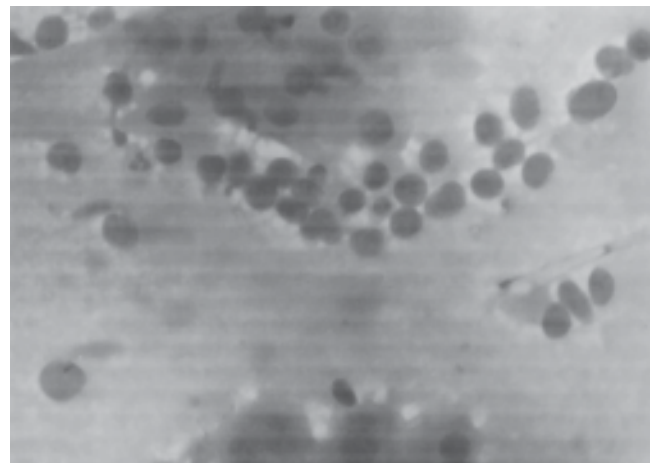


Fig. 8 : Poorly differentiated HCC - many naked nuclei, are round with macronucleoli, hardly resembles hepatocytes (H&E, x 400).

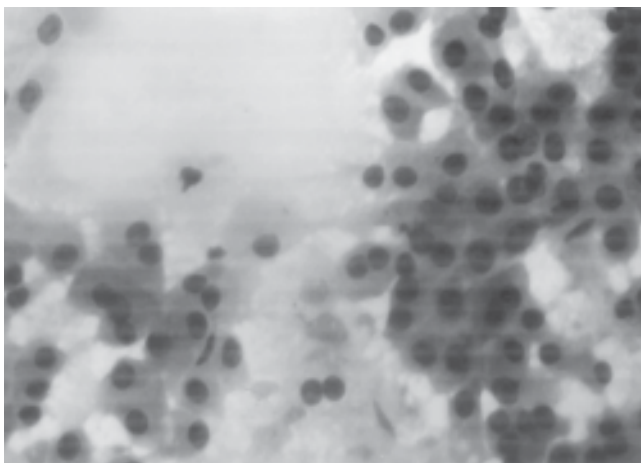


Fig. 6 : Well differentiated HCC- uniform tumour cells with N/C ratio slightly higher than normal hepatocyte and few binucleate cells enveloped by endothelial cells (H&E, x 400).

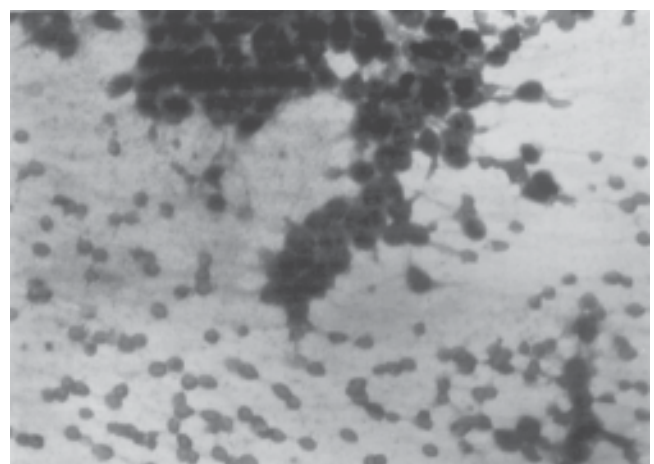


Fig. 9 : Hepatoblastoma - cellular aspirates consist of uniform population of small round cells having scanty finely granular cytoplasm. (H&E, x 400).

Liver biopsy was available in 3 cases and diagnosed as hepatocellular carcinoma, cirrhosis and metastatic

lesion (one each). The histopathological findings were correlated with cytological features.

## Discussion

FNAC is a very useful procedure for the diagnosis of various hepatic lesions. It offers accuracy without major complications and minimal interventions at low cost. The only absolute contraindications are marked haemorrhagic diathesis and suspected vascular lesion.<sup>6</sup> No complications were seen during this study.

The patients' main complaints were, pain abdomen in right upper quadrant, anorexia, weight loss and abdominal mass. SGOT, SGPT and alkaline phosphatase were increased in 60% of cases. All cases were subjected to ultrasonography guided FNA which has been reported to be safe, useful and accurate technique for making cytological diagnosis of hepatic masses.<sup>7,8</sup>

The patient's age ranged from 8 to 80 years with male predominance. The malignant lesions were common between 50-70 years while the benign were in age group of 20-40 years.

We studied and evaluated the different features in different lesions as described by Ali et al,<sup>4</sup> and Tao et al<sup>9</sup> to grade the HCC into grade I, II, III. The cytomorphological features were cellular arrangement, cell size, N/C ratio and cohesiveness of cells, nuclear shape and size, location, multinucleation, prominent nucleolus, amount of cytoplasm, vacuolation, bile production and hyaline bodies.

Similarly HCC was differentiated from other nonmalignant conditions of liver by the different features collectively like cellularity, acinar pattern, trabecular pattern, hyperchromasia, uniformly prominent nucleoli, multiple nucleoli and atypical naked nuclei as described by Cohen et al.<sup>10</sup> The most important and helpful cytological features were the trabecular pattern, irregularly granular chromatin, multiple nucleoli, atypical naked nuclei. The atypical naked nuclei were included as one of the important criteria for the diagnosis of HCC by Pedio et al<sup>8</sup> as these were rarely seen in benign and metastatic conditions.

The hepatoblastoma is a primary liver tumour in pediatric age group, consisting of small round to oval uniform sized cells. The cytoplasm was granular with indistinct borders. The nuclei has smooth nuclear membrane, chromatin was fine to coarsely granular and evenly distributed. Few cells had single nucleolus. The background was dirty with fragments of capillaries and plump spindle shaped endothelial cells.

Among the metastatic lesions, adenocarcinoma showed glandular or acinar pattern, intra and extracytoplasmic mucin. These tumours mainly came from the GIT, breast, ovary and prostate. The special stain PAS and MC were done for glycogen and mucin.

The squamous cell carcinoma showed large squamous cells arranged in syncytial pattern with basophilic cytoplasm and intracellular keratin. The cells were present in the necro-inflammatory background.

The small cell carcinoma showed small monomorphic cells with scanty cytoplasm and finely granular chromatin pattern of nuclei.

In the present setup from this study it is felt that USG guided FNAC is a very useful in diagnosis of different hepatic lesions as the procedure is simple and safe. The results are obtained quickly without serious complications related to the procedure. So, FNAC is a simple and effective diagnostic tool in our hand.

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