



Original Research Article

Role of Aspiration Cytology in Assessing Liver Lesions - Data from a Tertiary Care Centre

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ABSTRACT

Introduction: Diagnostic evaluation of hepatic lesions by clinical, radiological and biochemical means is a complicated task. Incorporation of ultrasound guided fine needle aspiration cytology on routine basis can aid in the same.

Objectives: To study the diagnostic role and effectiveness of ultrasound guided fine needle aspiration technique in interpretation of hepatic lesions.

Methodology: A total of 34 patients with clinical and radiological suspicion of a liver mass were studied using ultrasound guided aspiration in the period extending from January'2012- December'2012 and segregated into benign, primary and metastatic entities.

Results: Majority of the patients were in the age group of 40-80years. Of the 34 cases, 26 (76.47%) were malignant, 1(2.9%) benign neoplasm, 3(8.8%) non-neoplastic entities and 4(11.76%) inconclusive cases. Out of 26 malignancies diagnosed, 12 were hepatocellular carcinomas (HCC) (42.3%) while 14(53.85%) were metastatic lesions thus giving a diagnostic accuracy of 97.82% in our setup.

Conclusion: Fine needle aspiration cytology has proved to be a fairly accurate and minimally invasive method for the initial diagnosis of a hepatic mass. Our study proved its involvement in accurately distinguishing non-neoplastic from neoplastic lesions & categorizing different lesions.

Key words: Liver lesions, hepatocellular carcinoma, FNAC, metastatic tumors.

INTRODUCTION

In the changing times, there is a growing trend of formulating the diagnosis by a least invasive, short, simple, and cost-effective procedure. Primary diagnosis is most important before deciding upon the radical surgery or noninvasive treatment options like preoperative chemotherapy. The evaluation and management of discrete hepatic masses is a clinical problem further

compounded by the varied pathological picture & lack of knowhow.

Though FNAC is has been used as a first line investigation in primary evaluation of tumors like Breast, Thyroid, Lymph nodes & others. ^(1,2) But does this procedure also help in picking up various liver lesions is a question that is still debated. However FNAC offers several advantages like it can provide a predictive diagnosis of a benign or

malignant neoplasm and in many cases also of specific tumor type. The diseases involving liver may be non-neoplastic or neoplastic. Ultrasonography (USG) guided (FNAC) is a quick and reliable method for arriving at a definite diagnosis in focal hepatic lesions. ^(3,4) The main indication of doing liver FNA include single or multiple nodular lesions as demonstrated by palpation, USG or Computed Tomography (CT scan). ⁽³⁾ Inflammatory lesions or diffuse liver diseases may sometimes mimic mass-like lesions. Such lesions also are sampled by FNAC to rule out neoplastic lesions. ⁽⁵⁾

The differential diagnosis of hepatic mass lesions includes primary liver tumors (benign or malignant), metastatic deposits, congenital and acquired cysts, abscesses and granulomas. ⁽⁶⁾ The goal of the current study was to review our FNA cytology experience and diagnostic accuracy with suspected liver lesions at a tertiary referral medical center. Through this piece of work, we also try to point out diagnostic cytological criteria in pinpointing out a hepatocellular lesion.

MATERIALS AND METHODS

Ultrasound-guided (USG) percutaneous fine needle aspiration was performed on 34 patients with clinical, biochemical and radiological evidence of liver diseases with normal prothrombin time over one year period from January'12-December'12. The patients with hemangioma and hydatid disease of liver diagnosed by USG were excluded to prevent undue complications. Informed consent was taken in every case with explanation regarding the procedure, its complications, advantages and disadvantages. Prior to procedure, a physical examination was carried out to note size, location as to which lobe of liver.

The procedures were performed using 22-24 gauge needles capped to 10ml

disposable syringes either with/without aspiration under ultrasound guidance. The aspirated contents of the needle were expelled on to glass slides and air dried & wet fixed in 95% methanol. Six to ten smears were made and dry & wet fixed as required for performing May-Grönwald-Giemsa, Papanicolaou and hematoxylin and eosin (H & E) stains. Periodic acid-Schiff (PAS) and Ziehl-Neelson (ZN) stains were done whenever needed. Visible tissue fragments whenever obtained during FNA were studied as cell blocks. . The microscopic diagnosis was decided upon after taking into full consideration all the data including the cytomorphological, radiological, clinical examination and other relevant findings. Diagnostic interpretations in the lesions of interest were classified primarily as benign or malignant lesions and sub typing was attempted. The cytological results were correlated whenever possible by histopathological examination.

RESULTS

Patients were in the age group of 15-75 years with majority (85%) falling in the 40-80years of age. 27(79.41%) were males and 07(20.59%) were females with youngest patient being of 15 years of age & oldest being of 75 years of age. Table 1 shows age and gender distribution of liver lesions. Out of 34 cases, 26 (76.47%) were malignant, 1(2.9%) benign neoplasm, 3(8.8%) non-neoplastic entities and 4(11.76%) inconclusive cases.

Table: 1 Age and Gender distribution.

Gender	Patients' age groups(years)				Total
	15-30	31-45	46-60	61-75	
Male	01	05	12	09	27
Female	03	01	02	01	07
Total	04	06	14	10	34

Out of 26 malignancies diagnosed, 12 were hepatocellular carcinomas (42.3%) while 14(53.85%) were metastatic lesions.

Out of 12 cases of Hepatocellular carcinomas, 10 cases were in males with maximum no. of cases in age group of 61-75 years while 2 cases were in female. In metastatic malignancy of 14 cases, 9 cases were in males with maximum cases in age group of 46-60 years, while 5 cases were in female.

The most common metastatic tumours to liver included 7 cases of adenocarcinoma (50%) followed by 3(21.43%) of neuroendocrine carcinoma and one (28.57%) each of squamous cell carcinoma lung, granulosa cell tumour, adrenocortical neoplasm & poorly differentiated/ round cell tumor.

Primary malignancies of liver comprised mainly of well & moderately differentiated hepatocellular carcinomas 09(75%) with 03(25%) as poorly differentiated HCCs. In only 4 cases follow up histopathological data were available which confirmed 2 cases of adenocarcinomas, 1 case of hepatocellular carcinoma and in one case biopsy was inadequate for reporting. Since our institution being a tertiary care hospital, most of the cytologically diagnosed liver malignancies were referred to higher cancer centres in Ahmedabad & Mumbai leading to loss in valuable patient follow up.

DISCUSSION

Cytology was of help in diagnosing liver lesions successfully in 88.24% of cases which is comparable to a study done by Franca et al. ⁽⁷⁾ USG-guided FNAC offers good accuracy without major complications and minimal intervention at less cost. The only major contraindication being severe haemorrhage & vascular lesion. ⁽³⁾

Although imaging techniques have helped greatly with the early and accurate diagnosis of liver abscess, the appearances are often non-specific. There is some overlap between the radiologic features of

liver abscesses, HCC and metastases too. Tumours, primary or secondary, may undergo extensive necrosis, with the resultant radiologic image of the cavitory neoplasm mimicking abscesses; abscesses are accompanied by proliferative reactive changes, making radiologic differentiation from a neoplastic process almost impossible. In these situations, FNAC plays an essential complementary role. Liver FNA cytology is used mainly for diagnosing hepatic malignancies, primary / metastatic. The cytological picture is not only useful for deciphering & differentiating hepatic malignancies from non-malignant entities but also guide the cytopathologist in segregating hepatic carcinomas into well/moderately/poorly-differentiated grades. ⁽⁴⁻⁶⁾ The diagnosis of non-neoplastic parenchymal disease of the liver is made by identification of swollen hepatocytes, vacuolation and decreased cytoplasmic basophilia with disturbance of normal regularity of the liver cells and pronounced anisocytosis of the hepatocytes. ⁽⁴⁾

A classical well/moderately-differentiated Hepatocellular carcinoma is characterised architecturally by hypercellular aspirate consisting of dyscohesive clusters/groups of atypical hepatocytes with arborescent, tongue-like projections of broad trabeculae, with or without peripheral endothelial rimming/ transgressing vessels. ⁽⁸⁻¹⁰⁾ As the tumor grade increases, there is corresponding increase in cellular dissociation, with less evidence of transgressing and peripheral endothelium and fewer trabeculae. ^(11,12)

Table 2 shows the frequency of occurrence of cytoarchitectural and cytomorphological features in well and moderately differentiated hepatocellular carcinomas which typically guide the cytopathologist to reach the correct diagnosis of hepatocellular carcinoma. Atypical hepatocytic naked nuclei were seen

in increasing numbers with increase in grades of HCC, which distinguishes HCC from benign lesions. A well recognized difficulty in diagnosis by FNA cytology arises at the end of the malignant spectrum with a differential diagnosis of very well-differentiated hepatocellular carcinoma (HCC) from non-neoplastic, benign, macroregenerative liver nodules. (7,11,13) The most useful criteria to separate a Well-

differentiated-HCC from a reactive liver cell can be: architectural features on the smears/cell block sections, hypercellular smears, cohesive clusters, trabeculae, transgressing vessels/ peripheral endothelial rimming, small monotonous hepatocytes with nuclear crowding, increased nuclear cytoplasmic ratio, atypical naked nuclei & intranuclear cytoplasmic inclusions. (3,9-12)

Table: 2. Frequency of occurrence of cytoarchitectural and cytomorphological features in well and moderately differentiated hepatocellular carcinomas.

Architectural features	No. Of cases	Cytomorphological features	No. Of cases
Dyscohesive groups	09	High/ moderate cellularity	09
Scattered cells	07	Stripped nuclei	07
Acini	06	Macronucleoli	05
Clusters	05	Bi-/ multi-nucleation	08
Sheets	05	Intranuclear inclusions	09
Trabeculae	03	Increased mitosis	02
Transgressing vessels	08	Intracytoplasmic bile pigment	05
Endothelial rimming	06	-	

In our study, metastatic malignancies outnumbered primary liver neoplasms with Adenocarcinoma being the most common metastatic malignancy as also in a study by Jitendra et al. (12) Recognition of metastatic adenocarcinoma is usually easier if the same shows high degrees of differentiation. If the pathologist has access to previous relevant histories, then diagnosis can be pretty easy to pick. It all becomes hard if it is a poorly differentiated one. A markedly elevated Alfa fetoprotein and presence of a single over multiple satellite lesions may point towards a primary entity rather than to a secondary malignancy.

Three criteria differentiate HCC from metastatic tumour: Polygonal cells with centrally placed nuclei & prominent nucleoli, malignant cells separated by sinusoidal capillaries and intracytoplasmic bile. Two additional criteria, namely, endothelial cells surrounding tumor cell clusters and intranuclear inclusions were identified as being important secondary criteria for HCC. (3, 8, 11) Also stripped naked nuclei form an important differentiating

feature since they are absent in non-neoplastic & metastatic entities. (3) Metastatic adenocarcinoma exhibit malignant columnar cells in palisaded rows or acini, three dimensional clusters in a background of necrotic debris sometimes with mucin secretion. (12) Neuroendocrine tumors show round nuclei with speckled granular/hyperchromatic chromatin.

With a high accuracy, for liver lesions, FNAC is a valuable method that allows rapid diagnosis and acts as a substitute to core biopsy, scoring by its virtues of rapidity, cost effectiveness and at par results if diagnosed by experienced cytopathologists & with the usage of other ancillary techniques. Considering its accuracy, Fine needle aspiration cytology could turn out to be the first choice in interpretation of hepatocellular malignancies.

CONCLUSION

As a diagnostic tool, USG-guided FNA paves the way forward to future with it being a simple, quick, safe, highly

representative, cost-effective and an accurate method. Early diagnosis by guided aspiration minimizes further ancillary investigations and hence reduces the length of hospital stay.

FNAC can accurately distinguish non-neoplastic from neoplastic lesions, categorize different lesions & differentiate primary from metastatic tumors in the hands of an experienced cytopathologist. In a nutshell, FNA by its many-layered inherent virtues can & is being used as a primary diagnostic modality as far as diagnosing & sub typing of hepatic lesions is concerned and hence making it easier for the clinician in deciding upon the treatment protocol for a patient presenting with the same.

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