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Original Research Article

Image guided fine needle aspiration cytology of hepatic lesions – Two year study in a Tertiary health care centre, Telangana (Hyderabad)

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ABSTRACT

Introduction: Mass lesions of liver are generally evaluated by Fine needle aspiration (FNA). Aim of present study was to assess the utility of ultrasound guided FNA cytology in the diagnosis of hepatic lesions and to study the cytomorphological features of these lesions and to categorise them as inflammatory, benign and malignant

Materials and Methods: Patients who have been admitted during a period between 2018 to 2021 February with suspected liver diseases were subjected to ultrasound guided FNAC and cytological assessment.

Results: Fine needle aspirations of liver were performed on 39 patients. Out of which 26 were suspected by malignant lesions and 13 of non-neoplastic lesions. Of the 39 aspirations performed on patients with suspected malignancy, 26 were diagnosed as positive (66.66%). Among other 13 non- neoplastic lesions only 6 were diagnosed positive under cytological examination by FNAC (46.15%). This could be due to more yield of material in malignant lesions than non-neoplastic lesions of liver and technical expertise of FNA

Conclusions: In most of the cases Cytomorphological study of Hepatic masses by fine needle aspiration yields an accurate diagnosis but in some cases correlation with other investigations and ancillary studies are required for definitive diagnosis.

1. Introduction

Image guided FNA plays a significant role in diagnosing inflammatory, benign, malignant lesions of the abdomen. Separation between the above lesions is frequently troublesome. FNAC under image guided permits precise diagnosis. Categorizing them into neoplastic and non-neoplastic lesions can be done by imaging, and the rising use and responsiveness of radiological methods has been directed to accurate diagnosis. With the support of radiologic guidance for needle placement this technique is an effective way to obtain diagnostic material for rapid and accurate diagnosis. The best benefit is anyway that, it permits continuous perception of the needle tip as it goes through the tissue planes into the objective area of doubt.[1]

Desired cytology material studied obtained by guided FNAC helps in separating between neoplastic and non –neoplastic lesions. Presence of a pathologist during the procedure aids a combined and better consultation between the pathologist and the radiologist leading to precision clinical correlation, and also leading in suggestions of additional aspiration sites for example, culture or gram staining in abscesses or PAP, H and E and MGG staining in malignancies or by some other method for confirmation.[2]

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The principal sign for fine needle aspiration (FNA) of the liver is in the determination of nature of the lesion that incorporates both neoplastic, non-neoplastic as well as metastatic neoplasms. Directed FNA examining of space - occupying lesions of the liver is a protected technique. Liver is a typical site for both metastatic as well as neoplastic deposits.[3] FNA isn't valuable in distinguishing diffuse liver problems like hepatitis or cirrhosis yet might be utilized to preclude neoplasms from the differential diagnosis when inflammatory or diffuse liver diseases appear to be non-homogenous or mimic mass-like lesions on radiology to be non-homogenous or impersonate mass-like lesions on radiology.

Intra-abdominal masses are a common problem in the day-to-day surgical practice. The diagnosis which is obtained by FNAC helps in being the substitute for surgical procedures and also leads to early diagnosis and treatment. Most of the intra-abdominal masses are not palpable and even if they are palpable, their exact extent cannot be assessed precisely[4] FNAC under image guidance has brought about revolution in the field of cytological diagnosis. Because of high degree of accuracy, precision and minimum discomfort to the patient through this technique permits the accurate localization of non-palpable and deep-seated lesions in the body.[2] Image guided FNAC is routinely done when single or multiple lesions are located in inaccessible sites. It is very important to confirm the tissue diagnosis which is essential for both treatment as well as staging of cancer.

2. Aims and Objective

The present study is to assess the utility of Image guided FNA cytology in the diagnosis of hepatic lesions, to study the cytomorphological features of these lesions and to categorise them as non – neoplastic and neoplastic which aids in evaluating the diagnostic accuracy.

3. Materials and Methods

Patients who have been admitted during a period between 2018 July to 2021 February with suspected liver diseases were subjected to ultrasound guided FNAC and cytological assessment.

A total number of 39 patients with single or multiple space-occupying mass lesions of liver were subjected to US guided FNAC for a period of one and a half year at Departments of Pathology and Radiology, Kamineni Academy of Medical sciences and research center, LB Nagar [KAMSRC].

The contraindications that we considered for our enrolled patients are with, prolonged PT, haemorrhagic tendencies, hepatic surface haemangioma. Suspected extra-hepatic obstructive jaundice After complete clinical examination, explaining the protocol procedure to them, consent was obtained from the patients. Aspirations were done by the radiologist in dialogue with a pathologist. The patients underwent an ultrasonographic evaluation for assessment of the origin mass and its relationship with the adjacent organs.

A percutaneous FNAC of the lesion was finished under USG direction, avoiding potential risk and was finished by the most straightforward and safe course to the site, under the direction of the radiologist.

Radiological gear utilized is a 10 ml one time utilize plastic needle and a 23 gauge needle. For lesions that can't be reached, a 20-22 gauge spinal needle of 9cm length. Each sample obtained was spread on a slide, air dried and 95% alcohol fixed smears were ready for Giemsa, Papanicolaou and Leishman stains, separately. Special stains were utilized if needed for exact analysis.

A complete number of 39 patients with single or different space-involving mass lesions of liver were exposed to US directed FNAC for a time of one and a half year at Departments of Pathology and Radiology, Kamineni Academy of Medical sciences and exploration focus, LB nagar [KAMSRC].

3.1. Inclusion criteria

Patients with liver complications.

4. Results

Our study is composed of a total number of 39 cases with detailed clinical information and necessary laboratory investigations.

Altogether 39 patients were in between the age of 20yr to 80yrs, with 25 males and 14 females having a M:F ratio 1.7:1

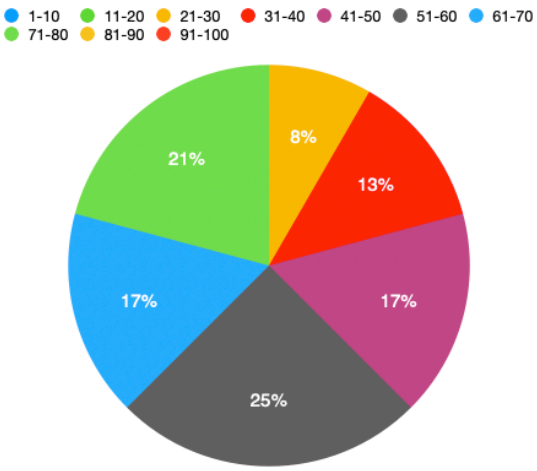

Fig. 1: Age disturibution

Table 1:

Cytological category	Number of patients
Normal	2
Non-neoplastic	7
Neoplastic	27
Inadequate for opinion	3

1. 36 Cases were satisfactory accounting to 92.30% out of 39.
2. Out of the total cases where a definite cytological interpretation was possible, cyto- diagnosis revealed non-neoplastic lesions in 7 cases (17.94%) and 27 (69.23%) malignant lesions.
3. Infectious lesions were 18 42% (7 cases).
4. Neoplastic lesions were 69.23% (27 cases) out of which 3 cases were HCC (7.69%), 17 cases were metastatic adenocarcinoma (43.5%) and 6 were poorly differentiated (15.38 %) and 1 multiple myeloma metastasis (2.56 %).

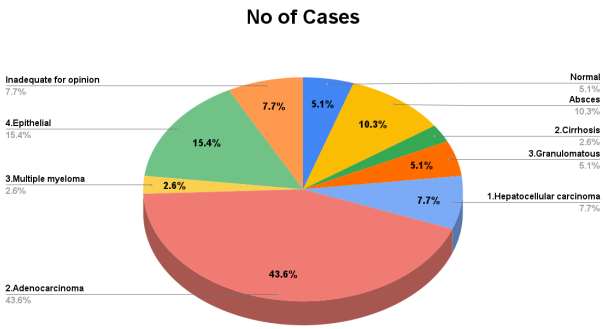

Fig. 2: Neoplastic lesions

The hepatocytes are present as single cells, or monolayered small cell groups and sheets.(Figure 3)

Hypercellular aspirates composing of cohesive clusters of atypical hepatocytes with arborescent, tongue-like projections showing broad trabeculae, with or without peripheral endothelial rimming are pathognomonic of classic HCC.[5] (Figure 5) and was seen in 3 cases out of 39.

Metastatic deposits of multiple myeloma was seen in 1 case out of 39 cases.(Figure 7)

Adeno carcinoma metastases seen in 17 cases out of 39.(Figures 6 and 8)

5. Discussion

The normal cytology of a hepatocyte is large polygonal cell with abundant granular cytoplasm, One or two round to oval, centrally placed nuclei, Even chromatin pattern and

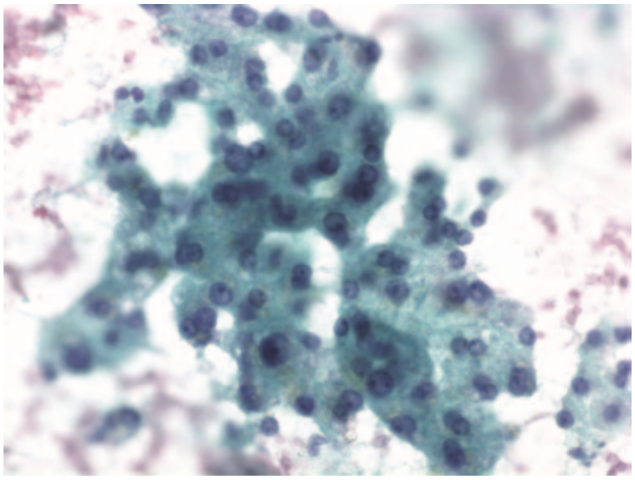

Fig. 3: Monolayered small cell

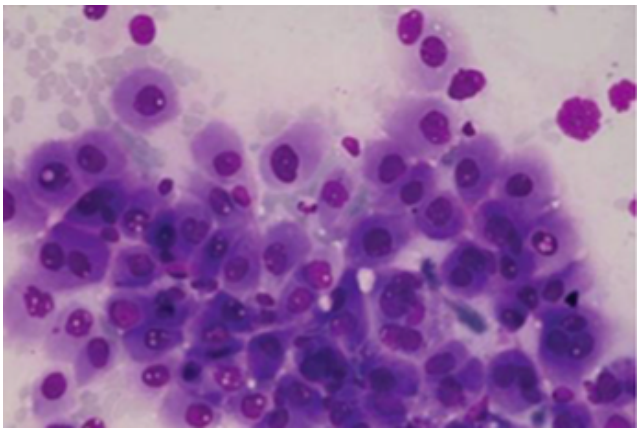

Fig. 4: Atypical hepatocytes

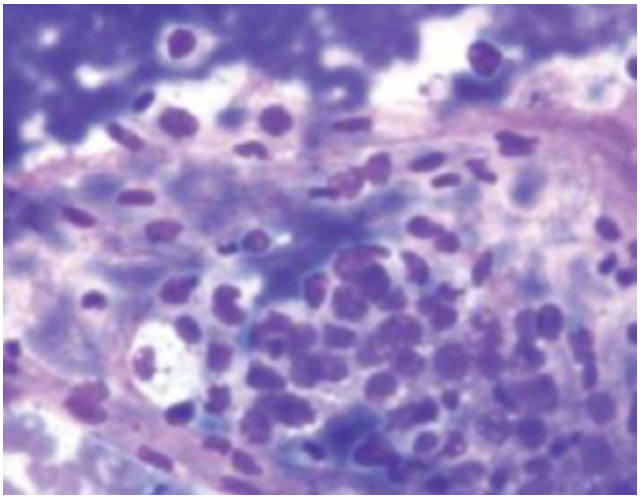

Fig. 5: Peripheral endothelial rimming

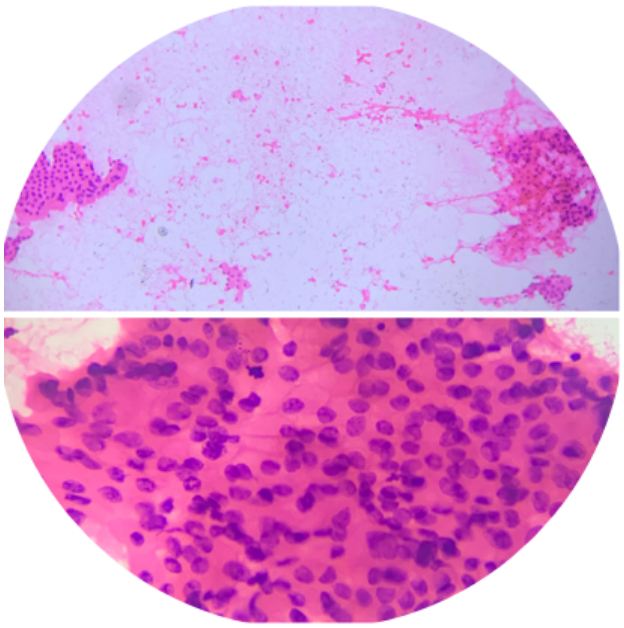

Fig. 6: (Low power field, High power field)

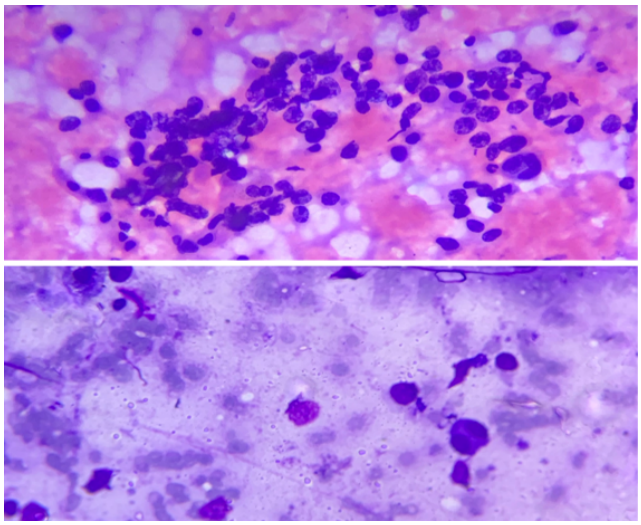

Fig. 7: Low power field, High power field.

occasionally prominent nucleoli they generally appear as small clusters or Larger flat sheets with irregular jagged edges without endothelial cell wrapping or appear as single cells.[6–10]

Benign bile duct epithelial cells present as - Varying sizes of flat monolayered sheets of epithelial cells. On-edge or in small acinar structures or groups, they are smaller than benign hepatocytes, with round regular nuclei, inconspicuous nucleoli, having less abundant cytoplasm than hepatocytes. Endothelial cells of sinusoidal spaces and Kupffer cells are rarely appreciated in benign lesions.

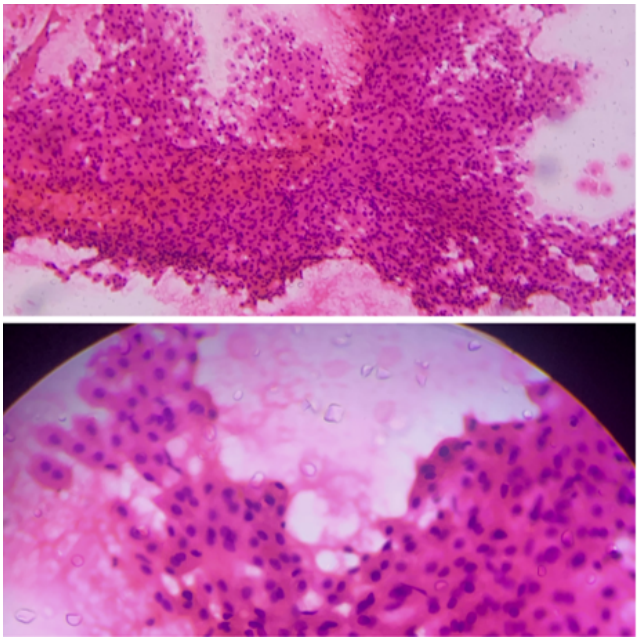

Fig. 8: Low power field, High power field.

FNAC is broadly used and is an exceptionally exact technique to acquire tissue for analysis in various lesions. It is mostly utilized in liver for diagnosing mass lesions.[5]

Sometimes, inflammatory lesions and parenchymal disease may present as mass-like lesion in radiographs which may be differentiated from malignancy by FNAC.

But the limitations of FNAC in liver lesions are

1. It is less useful in patients with diffuse parenchymal diseases like hepatitis/cirrhosis,
2. In poorly differentiated tumors difficult to differentiate whether it is primary or metastatic,
3. Risk of bleeding and intraperitoneal tumor spillage.

The diagnostic accuracy in our study (92.8%) was similar with most of the studies reported in literature Swamy et al.,[11] (97.5%), Mondal (99.5%),[12] Kuo et al.,[13] (86.1%). Few studies have shown the cost effectiveness of FNAC in diagnosing liver lesions.[14] The reported incidence of complications following FNAC was 2.4% and mortality rate was 0.1%.

6. Conclusion

USG directed FNAC is a quick, accurate, painless and a safe demonstrative method which can be helpfully utilized in different abdomino-pelvic masses, consequently keeping away from pointless, costly and frequently obtrusive symptomatic procedures.[15]

This likewise offers benefit of fast determination with the least careful intercession. The fundamental benefit of FNAC is the chance of different passes, which

builds the possibilities acquiring sufficient material. The contraindications of FNAC are hemorrhagic diathesis, delayed prothrombin time, vascular structure in the path and suspected extrahepatic obstructive jaundice.[16]

The techniques of image guided FNA not only permit precise anatomical imaging and targeting of lesions but will also allow planning of a safe access route with constant visualization of needle tip during procedure, thereby reducing the risk of complications. FNAC is a highly sensitive and specific which is an accurate and cost effective diagnostic procedure with a minimal complication rate.[17]

7. Conflict of Interest

The authors declare no relevant conflicts of interest.

8. Source of Funding

None.

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