Cytomorphological Patterns of Focal Nodular Lesions of Liver at a Tertiary Care Hospital

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Abstract
USG guided Fine needle aspiration cytology (FNAC) is an important and valuable technique for diagnosing benign and malignant space occupying lesions of liver. In present study all cases Coming to Sawai Man Singh Hospital Jaipur from July 2018 to December 2018 with focal nodular lesions in liver and adequate cellularity were included. Age range was 32 to 75 years. Primarily the diagnosis was made on May-Graunwald-Giemsa, Hematoxylin and Eosin (H and E). Maximum number of patients (43%) presented with clinical feature of pain in right hypochondrium. Cytomorphologically out of total 100 cases 23% were benign and 77% were neoplastic. Out of total benign lesions 34.7% were of cirrhosis and least 4.34% were of granulomatous lesions and dysplastic nodule each. Out of total 77 neoplastic lesions maximum 40.2% were metastatic, 28.55% of primary hepatocellular carcinoma and least 1.2% were of Hepatoblastoma embryonal type and small cell neuroendocrine carcinoma. Out of total 31 metastatic lesions maximum 12 were from lung carcinomas and only 1 case of plasma cell myeloma. FNAC is a safe and cost effective method that can differentiate benign and malignant lesions accurately.

Keywords: Liver SOL, Hepatocellular carcinoma, Cirrhosis, Malignant epithelial neoplasm.

Introduction
The liver is a large solid organ performing several functions of metabolism, storage and bile synthesis.
Diseases of the liver can be broadly categorised into diffuse disorders or focal space occupying lesions which is the target of fine needle aspiration cytology (FNAC) performed under USG or CT guidance.
Fine needle aspiration cytology (FNAC) is a minimally invasive, cheap and quick technique for the diagnosis of liver space occupying lesions without any significant complications and minimizing the requirement of biopsy(1). It has a very high diagnostic accuracy, greater than 85% (2).

Like many other institutions, liver is the most commonly aspirated abdominal organ in our institution as well.
The present study is conducted to enumerate the cytomorphological spectrum of liver space occupying lesions (SOLs) in a tertiary care hospital.
Material and Methods
All patients coming to Sawai Man Singh Hospital, Jaipur from July 2018 to December 2018 with focal nodular lesion in liver and adequate cellularity were included in the study. An informed consent was taken from all the patients. Complete clinical details, radiological and serology findings were taken from the patient. Patients with bleeding disorders were excluded from our study. FNAC was performed under ultrasound guidance with the assistance of a radiologist.

Under aseptic precautions and with the patient in a comfortable supine position, we used disposable spinal needles (22/23 gauge), 5-10 rapid passes were given. Suction was then applied by 10/20 ml plastic syringe attached to the needle. The slides once prepared were immediately fixed in absolute alcohol. Some of the smears were air dried. May-Grunwald-Giemsa, Hematoxylin and Eosin (H and E) stains were used for routine cytological evaluation.

Observations and Results
During the study period 100 patients were subjected to fine needle aspiration cytology of liver. Out of these cases 47 were males and 63 were females. Age of the patients range from 32 to 75 years. Ultrasonography of liver revealed solitary mass in 40%, multifocal lesion in 20% and diffuse parenchymal disease in 40% cases. Cytologically liver lesions were categorised into benign lesions (23%) and neoplastic lesions (77%).

Table 1: Frequency distribution of cases according to clinical features

| Symptoms                | No of cases |
|-------------------------|-------------|
| Pain right hypochondrium| 43          |
| Jaundice                | 21          |
| Ascites                 | 6           |
| Decrease in appetite    | 12          |
| Pruritis                | 8           |
| Vomiting                | 10          |
| Total                   | 100         |

In the above table, 43% of patients presented with symptom of pain in right hypochondrium, 21% with jaundice, 12% with decrease in appetite, 10% with vomiting, 8% with pruritis and least 6% with ascites.

Out of 23 benign lesions out of total 100 cases, maximum 34.7% were of cirrhosis, 21.7% of inflammation, 17.39% cystic lesions, 8.6% each of haemangioma and amoebic abscess and minimum 4.34% each of granulomatous lesions and dysplastic nodules.

Table 2: Distribution of benign cases

| Benign lesions | No of cases | Percentage |
|----------------|-------------|------------|
| Granulomatos   | 1           | 4.34%      |
| Haemangioma    | 2           | 8.6%       |
| Amoebic abscess| 2           | 8.6%       |
| Cirrhosis      | 8           | 34.7%      |
| Inflammation   | 5           | 21.7%      |
| Cystic lesion  | 4           | 17.39%     |
| Dysplastic nodule | 1     | 4.34%      |
| Total          | 23          | 100%       |

In the above table, 43% of patients presented with symptom of pain in right hypochondrium, 21% with jaundice, 12% with decrease in appetite, 10% with vomiting, 8% with pruritis and least 6% with ascites.

Fig 1 (pie chart): representation of clinical features.

Fig 2: (40X, H&E) Photomicrograph showing neutrophils and RBCs-Inflammatory pathology of liver.
Table 3: Distribution of neoplastic lesions

| Neoplastic Cases             | No of Cases | Percentage |
|-----------------------------|-------------|------------|
| Primary (HCC)               | 22          | 28.5%      |
| Metastatic tumors           | 31          | 40.2%      |
| Malignant Epithelial Neoplasm | 10        | 12.9%      |
| Small cell Neuroendocrine carcinoma | 1   | 1.2%     |
| Adenocarcinoma              | 8           | 10.3%      |
| Round cell carcinoma        | 4           | 5.1%       |
| Hepatoblastoma embryonal type | 1         | 1.2%       |
| **Total**                   | **77**      | **100%**   |

Out of 77 neoplastic lesions, maximum 40.2% were metastatic lesions, 28.5% were primary hepatocellular carcinomas, 12.9% were malignant epithelial neoplasms, 10.3% were adenocarcinomas, 5.1% were round cell carcinomas, 1.2% each of small cell neuroendocrine carcinomas and hepatoblastoma embryonal type.

Figure 3: (40X, H&E) Photomicrograph of Hepatocellular carcinoma

Table 4: Distribution of metastatic lesions

| Metastatic lesions             | No of Cases |
|-------------------------------|-------------|
| Gastric carcinoma             | 2           |
| Lung carcinoma                 | 12          |
| Ovary carcinoma                | 4           |
| Malignant melanoma             | 4           |
| Plasma cell myeloma            | 1           |
| Metastatic squamous cell carcinoma | 8       |
| **Total**                      | **31**      |

Out of total 31 metastatic cases, maximum 12 were of lung carcinoma, 8 were of metastatic squamous cell carcinoma, 4 cases each of ovarian metastasis and malignant melanoma, 2 cases were of gastric metastasis and least number 1 case of plasma cell myeloma.

Figure 4: (40X,H&E) Photomicrograph of Metastatic Small Round cell carcinoma

Figure 5: (40X,H&E) Photomicrograph of Metastatic Mucinous Adenocarcinoma from the Gall bladder

Figure 6: (40X, H&E) Photomicrograph of Metastatic Malignant Melanoma in liver
Figure 7: (40X, H&E) Photomicrograph of metastatic squamous cell carcinoma in lymph node

Discussion
In our study, out of total 100 cases 23 were benign cases. Out of total benign cases maximum 34.7% were of cirrhosis followed by 17.39% of cystic lesions. The least number of benign cases were of granulomatous lesions and dysplastic nodules i.e. 4.34% each. Similarly Rasania et al. identified 23.3% of the cases as benign and 67.7% as malignant. The same study also diagnosed cirrhosis, abscess, parenchymal liver diseases and regenerative nodule from cytomorphological findings. Rasania et al. also reported 63.4% cases as malignant and 36.6% as benign.

In our study out of 77 neoplastic cases, maximum 40.2% cases were of metastatic tumours, followed by 28.5% of primary hepatocellular carcinoma and 12.9% were of poorly differentiated carcinoma. Least number of cases were of small cell neuroendocrine carcinoma and hepatoblastoma-embryonal type i.e. 1.2% each. Similarly Montali et al and Khanna et al reported a higher incidence of metastatic neoplasms. Comparable results were also obtained by Nosher et al. In our study, maximum 43 patients presented with pain right hypochondrium followed by jaundice and decrease in appetite, only 6 patients out of 100 presented with ascites. Among 31 cases who presented with metastasis, maximum patients (12 cases) presented with metastasis of lung carcinoma, followed by 8 cases of metastatic squamous cell carcinoma. In present study there were 4 cases each of metastasis of ovarian carcinoma and malignant melanoma. 2 cases were of gastric metastasis and least 1 case of plasma cell myeloma.

Study performed by Orell et al have shown metastatic liver malignancy as high as 90%. In a study conducted by Siddiqui et al Around 220/341 cases (64.51%) were neoplastic lesions and the majority of the cases were malignant, i.e., 217/220 cases (98%). Among the metastatic lesions, adenocarcinoma (not otherwise specified) was the most common tumor constituting 143/220 (65%) of all metastatic tumors. The most common primary malignant lesion was HCC 60/220 cases (27.27%). Three cases of each metastatic intraductal carcinoma breast, hepatoblastoma, and adenoma were reported. Two cases of each metastatic renal cell carcinoma and metastatic squamous cell carcinoma were reported.

Conclusion
In the present study, it is concluded that USG-guided FNAC is a very useful procedure in the diagnosis of hepatic lesions as the procedure is simple and safe. The early diagnosis can be done by FNAC along with USG finding without any serious complications related to the procedure.

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