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Research Article

CYTOPATHOLOGIC DIAGNOSIS OF LIVER MASS LESION

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ABSTRACT

Objective: The objective of the study is to categorize and establish the various cytological patterns of liver lesions.

Methods: The present study was a hospital-based both retrospective and prospective study, on 504 patients with liver space-occupying lesions (SOLs) as USG/CT-guided fine needle aspiration cytology or biopsy was done and the smears or tissue was sent to the Department of Pathology, for 5 years between January 2018 and December 2022. Investigations done before the procedure was platelet count and plasma prothrombin time to know patients with bleeding tendencies. Under ultrasonography guidance, fine needle aspiration was performed on patients diagnosed for nodular or diffuse lesions of the liver.

Results: Mean age of the study population was 58.53±12.62 years, 60.32% were male, 87.30% were Hindu, and 68.45% were rural. The most common complaint was pain abdomen 384 (76.19%) followed by jaundice 70 (13.89%). About 95.44% were neoplastic nature out of which 98.96% were malignant, out of which 83.61% were secondary. Out of 64 primary neoplastic lesions, maximum 98.44% were hepatocellular carcinoma. Out of 398 secondary neoplastic lesions, maximum 87.69% were metastatic carcinoma.

Conclusion: We concluded that in any SOL, the screening of the liver is essential for early detection and long survival of cases.

Keywords: Histopathology, Space-occupying lesions, Liver.

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INTRODUCTION

Liver diseases are common health problem throughout the world. Liver diseases are broadly categorized as diffuse and focal lesion. The differential diagnosis of focal lesions is primary liver tumors (benign and malignant), metastatic deposits, congenital and acquired cysts, and abscess [1]. Appropriate clinical management depends on accurate diagnosis but evaluation of the lesion is a common clinical problem [2]. Imaging techniques and serological markers are useful in narrowing the differential diagnosis.

In most cases, the diagnosis presents no significant challenges to the pathologist. Problems tend to occur when the lesion is a very well-differentiated hepatocellular process, which the pathologist must identify as benign or malignant or a poorly differentiated neoplasm that arises in a patient without any other known malignancy, for which the pathologist must determine if it is a primary or metastatic lesion.

The varied array of primary benign and malignant masses and the high rates of metastases to the liver account for much of the diagnostic difficulty encountered. Primary tumors can be solid or cystic and can arise from epithelium (hepatocyte, bile duct epithelium, and neuroendocrine cells) or mesenchymal cells (principally endothelium) or heterotopic tissues. The majority of malignant hepatic neoplasms in normal liver represents metastatic carcinoma derived from virtually any primary site, whereas in patients with cirrhosis, hepatocellular carcinoma (HCC) is more common.

Hepatic masses are increasingly being detected on radiography with the use of sophisticated abdominal imaging studies. Specific diagnoses can often be suspected based on sensitive radiographic imaging techniques (computed tomography and magnetic resonance imaging) coupled with clinical data and blood investigations.

Aim

The aim of the study is to establish the various cytological patterns of the lesion of liver.

METHODS

The present study was a hospital-based both retrospective and prospective study, on 504 patients with liver space-occupying lesions (SOLs) as USG/CT-guided fine needle aspiration cytology (FNAC) or biopsy done and the smears or tissue was sent to the Department of Pathology, for 5 years between January 2018 and December 2022. Investigations done before the procedure was platelet count and plasma prothrombin time to know patients with bleeding tendencies. Under ultrasonography guidance, fine needle aspiration was performed on patients diagnosed for nodular or diffuse lesions of the liver.

The patient was placed in a supine position. After cleaning with spirit needle was introduced into the lesion and to and fro movements done in various directions. A negative pressure is applied to aspirate material. After getting the material, needle was withdrawn and material was pushed on cleaned slides and smears were prepared. These smears were fixed in fixative 99% methanol which present in coplin jar. If necessary, repeat aspiration was done to get sufficient material for diagnosis. The slides were fixed in fixative nearly half an hour and subsequently stained with hemotoxylin and eosin and PAS if needed.

Permission from ethical committee and informed written consent of the study population was taken. Collected data were entered in the MS Excel spreadsheet, coded appropriately, and later cleaned for any possible errors. The statistical analysis was carried out using IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp. Armonk, NY, USA). All data were collected and analyzed by qualitative Chi-square and quantitative *t*-test. All tests were performed at a 5% level of significance; thus, an association was significant if the $p<0.05$.

RESULTS

Mean age of study population was 58.53±12.62 years, 60.32% were male, 87.30% were Hindu, and 68.45% were rural (Table 1).

The most common complaint was pain abdomen 384 (76.19%) followed by jaundice 70 (13.89%) (Fig. 1).

About 95.44% were neoplastic nature out of which 98.96% were malignant, out of which 83.61% were secondary. Out of 64 primary neoplastic lesions, maximum 98.44% were HCC. Out of 398 secondary neoplastic lesions, maximum 87.69% were metastatic carcinoma. The most common site of primary for liver lesion was carcinoma lung 154 (37.38%), 82 (19.90%) of carcinoma breast, and 64 (15.53%) carcinoma cervix whereas minimum 2 (0.49%) cases of pancreas (Tables 2 and 3).

DISCUSSION

In our study, maximum 33.53% were in 61–70-year age group whereas minimum 1.39% were in ≤30 years and 2.18% in >80-year age group. The mean age of study population was 58.53±12.62 years. Similarly, Swamy *et al.* (2011) found that the patients ranged from 8 months to 90 years. Furthermore, Ali *et al.* (2013) [3] in their study found that patients' age was ranged from 22 years to 85 years. Furthermore, Dhameja *et al.* (2013) [4] found that the patients' age range was 2 years to 70 years. In our study, maximum 60.32% were male whereas 39.68% were female. Similarly, Swamy *et al.* (2011) [2] observed 24 females (33.33%) in their study.

In our study, maximum 87.30% were Hindu and 12.70% were Muslim, 68.45% were rural whereas minimum 31.55% were urban population with the most common complaint being pain abdomen 384 (76.19%). Similarly, in Dhameja *et al.* (2013), the clinical presentation was pain.

In our study, maximum 59.52% were multifocal lesions and maximum 95.44% were neoplastic nature whereas minimum 4.56% were non-neoplastic nature. Similarly, in Swamy *et al.* (2011), they found that neoplastic lesions (68.06%) were more common than non-neoplastic lesions (30.56%). Furthermore, Dhameja *et al.* (2013) found that out of 57 cases, 54 cases (94.7%) were diagnosed as neoplastic and three cases as non-neoplastic lesions (5.2%).

In our study, out of 481 neoplastic lesions, maximum 98.96% were malignant whereas minimum 1.04% were benign lesion. Similarly, Reddy *et al.* (2015) found that 5 cases were benign tumor and 89 cases (88.1%) were malignant. Furthermore, Ali *et al.* (2013) found that out of 122, 95 were malignant and 17 were benign lesions. In our study, out of 476 malignant lesions, maximum 83.61% were secondary followed by 13.45% primary whereas minimum 2.94% were not specified. Similarly, Ali *et al.* (2013) found that 40 cases were primary cancers and 2 were suspicious for malignancy. Dhameja *et al.* (2013) found that out of 54 neoplastic cases, 12 (22.2%) were diagnosed as primary hepatic malignancies and 42 (77.77%) were secondary (metastatic) hepatic malignancies.

The diagnosis of HCC and metastatic carcinoma was based on features now well documented in numerous series [6]. HCC was diagnosed on the following cytomorphological criteria: High cellularity, high N/C ratio, polygonal cells forming thick trabeculae, endothelial cells surrounding trabeculae, capillaries transgressing tumor cell clusters, presence of bile pigment, intranuclear inclusions, atypical naked nuclei, and presence of dysplastic hepatocytes. Diagnosis of metastatic adenocarcinoma was based on the following criteria: Three-dimensional cell clusters, cell dispersion, cuboidal to columnar cell pattern, cytoplasmic vacuolation, acinar and/or glandular formation, presence of mucin, necrosis, normal-appearing hepatocytes, and cholangiolar cells. Metastatic squamous cell carcinoma was diagnosed based on the presence of squamous cells, cytoplasmic keratinization, dense nuclear hyperchromasia, tadpole cells, and elongated cells.

In our study, out of 64 primary neoplastic lesions on FNAC, maximum 98.44% were HCC whereas minimum 1.56% were hepatoblastoma. Similarly, Swamy *et al.* (2011) found that majority of the neoplastic

Table 1: Sociodemographic profile of study subjects

Age group	No.	Percentage
≤30	7	1.39
31–40	41	8.13
41–50	89	17.66
51–60	120	23.81
61–70	169	33.53
71–80	67	13.29
>80	11	2.18
Gender		
Male	304	60.32
Female	200	39.68
Religion		
Hindu	440	87.30
Muslim	64	12.70
Residence		
Rural	345	68.45
Urban	159	31.55

Table 2: Pattern of lesions

Lesion	No.	Percentage
Multifocal	300	59.52
Unifocal	204	40.48
Nature		
Neoplastic	481	95.44
Non-neoplastic	23	4.56
Neoplastic lesion		
Benign	5	1.04
Malignant	476	98.96
Malignant lesion		
Primary	64	13.45
Secondary	398	83.61
Not specified	14	2.94

Table 3: Diagnosis made among study subjects

Primary	No.	Percentage
Hepatocellular carcinoma	63	98.44
Hepatoblastoma	1	1.56
Secondary		
Adenocarcinoma	34	8.54
Small cell carcinoma	9	2.26
Neuroendocrine carcinoma	3	0.75
Anaplastic carcinoma	2	0.50
Malignant melanoma	1	0.25
Metastatic carcinoma NOS	349	87.69

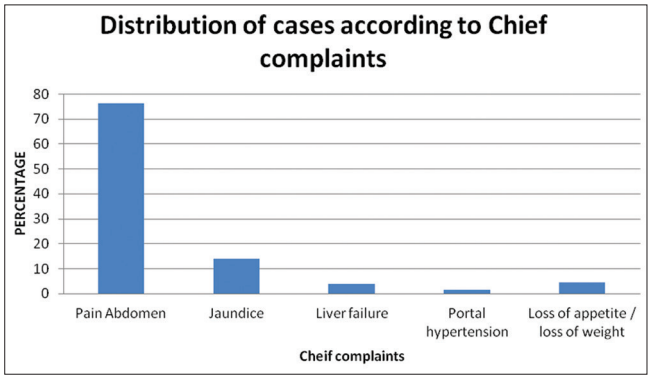

Fig. 1: Chief complaints of the study subjects

lesions were HCCs (36.12%). Furthermore, Dhameja *et al.* (2013) found that out of 12 primary, 4 (7.4%) were hepatoblastomas and 8 (14.8%) were HCCs, of which 6 were adult HCCs and 2 were pediatric HCCs.

They could represent either poorly differentiated HCC or poorly differentiated metastatic lesions. Immunocytochemical analysis – not available in a primary care medical facility – would have clarified this uncertainty.

In our study, out of 398 secondary neoplastic lesions on FNAC, maximum 87.69% were metastatic carcinoma NOS followed by 8.54% adenocarcinoma and 2.26% small cell carcinoma whereas minimum 0.25% malignant melanoma, 0.50% anaplastic, and 0.75% were neuroendocrine lesions. Similarly, Swamy *et al*. (2011) found metastatic adenocarcinomas (19.45%). Furthermore, Ali *et al.* (2013) found that metastatic lesions were 55 including squamous cell carcinoma, adenocarcinoma, malignant melanoma, neuroendocrine, and small cell carcinoma. Our study was consistent with Dhameja *et al*. (2013) found that 34 were adenocarcinomas (63%), 2 were squamous cell carcinomas (SCC) (3.7%), 2 were neuroendocrine tumors (3.7%), 2 were melanomas (3.7%), 1 was non-Hodgkin lymphoma (1.8%), and 1 anaplastic carcinoma (1.8%).

In a study of 482 patients with HCC, the most frequent metastatic sites were reported to be lung (53.8%), bone (38.5%), lymph nodes (33.8%), adrenal glands (16.9%), and peritoneum (9.2%) [7,8]. Reported cytology of spleen metastasis showed classic cytologic features of HCC and immunostain pattern [9,10]. Serous effusions in patients with HCC are common (about 30% of cases). HCC causes ascites by increasing portal pressure by replacing liver parenchyma with tumor and/or leading to benign or malignant thrombosis of the portal vein. However, the presence of HCC in serous effusions is rarely encountered in clinical practice due to the low incidence of peritoneal metastasis [11]. A study of the incidence of serous fluid involvement in 44 cases of HCC with serous effusions showed a low rate of serous effusions metastasis (about 5%, 2 of 44 cases) in patients with or without distant metastasis [12] In a study of 148 patients with extrahepatic metastatic HCC, the most frequent locations of metastasis were reported to be lung (55%), the abdominal lymph nodes (41%), and the bone (28%) [13]. In a study of 20 patients with HCC bone metastasis at initial presentation, the most common site of bone metastasis was the vertebrae (60%), consistent with our findings in the present study [14].

CONCLUSION

In this study, we found that malignant liver lesions are more prevalent than benign and many of these patients, being in advanced stage of their disease, have poor prognosis. In malignant lesions, secondary lesion was more so in any SOL; the screening of the liver is essential for early detection and long survival of cases. Palliative medical care may represent a humane and compassionate approach to this group of patients.

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AUTHORS' CONTRIBUTION

All the authors have contributed equally.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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