

ULTRASOUND – GUIDED FINE-NEEDLE ASPIRATION BIOPSY OF METASTATIC LIVER DISEASE: A COMPARATIVE ASSESSMENT OF HISTOLOGICAL AND CYTOLOGICAL TECHNIQUES

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ABSTRACT

Introduction: Liver is the most common site of distant metastases. Vast majority of malignant tumours in liver are metastatic most commonly adenocarcinoma from colon, pancreas, breast and lung.

Background: Combined cytological and histological preparation via one – shot fine needle aspiration can be evaluated, especially in outpatients. Technique could guide management in the setting of equivocal imaging and serology.

Material and Methods: Study was carried out on 64 patients admitted to the gastrointestinal ward of Sheikh Zayed Hospital Lahore with space occupying lesion (SOL). Lesions were aspirated under ultrasound guidance using 18 – gauge lumber puncture needle. The aspirate was used for histology and slides for cytological examination.

Results: It is observed that on the basis of cytological examination 11 cases were confirmed as benign and 52 as malignant whereas on histological basis 08 cases were confirmed as benign and 50 as malignant. Diagnosis on cytology showed 27 cases of metastatic adenocarcinoma, 11 case of melanoma, dysphasia, and sarcoma (08). The cytology could provide correct diagnosis is 80.8%. The sensitivity specificity, positive value, and negative predictive value, were 96.3%, 100%, 100%, 84.6% respectively. On histology, a final diagnosis on haemotoxylin and eosin (H&E) stained slides could be reached in 52 out of 54 malignant lesions. Of these 54 metastatic lesions, 37 were adenocarcinomas. Eight were malignant melanoma, 7 were metastatic spindle cell carcinoma and 2 were unclassified malignant tumours.

Conclusions: It was concluded that aspiration cytology is quite accurate in detecting and classifying malignancy as compared to histological techniques. However combined cytology and histology increases the diagnostic sensitivity.

Key Words: Liver metastasis, cytology, histology, fine needle biopsy.

INTRODUCTION

Liver is the most common site of distant metastases. Vast majority of malignant tumours in liver are metastatic most commonly adenocarcinoma from colon, pancreas, breast and lung. Cancers spread to the liver because liver filters most of the blood from the body.¹ Kupffer cells in liver are regarded as powerful defenses against primary liver cancer and metastatic lesions in liver, however, recent studies show that under long term ischaemic – hypoxic stress, Kupffer cells can secrete a variety of pro-inflammatory mediators to promote fibrosis or even carcinogenesis.^{2,3}

The aspirate from metastatic adenocarcinoma of liver (the most common metastatic tumour in our study) was composed of columnar cells with oval nuclei and varying degree of pleomorphism, hyperchromasia and nucleolar prominence with focal glandular honeycomb pattern having a dirty necro-

tic background. Other metastatic malignant tumours of liver include metastatic melanoma, spindle cell carcinoma etc.^{4,5} The diagnostic approach to space – occupying lesions in the liver can be difficult and a histogenetic classification of the primary tumour is impossible in some cases.⁶

Needle biopsy of a suspicious liver lesion is a very safe procedure and a reliable method in diagnosing liver tumors. It is used to diagnose tumours deep in the skin, lymph nodes and other sites. Guided liver biopsy remains the gold standard for the diagnosis and the staging of the disease. It is essential for the diagnosis of focal liver lesions.^{7,8} Results of cytology, histology of Menghini cores, and histology of cell blocks can be correlated with the final diagnoses obtained by the clinicians. It was observed in a study that results obtained from cytology (95%) were more correct than the results after histology (89%).³

Combined cytological and histological preparation via one – shot fine needle aspiration can be evaluated, especially in outpatients⁹. Technique could guide management in the setting of equivocal imaging and serology. The incidence of needle track seeding following biopsy of a suspicious liver lesion is ill – defined.^{10,11} Tumour seeding after fine – needle biopsy of hepatocellular carcinoma was observed in 0.6 to 5.1% of cases. This complication may be detected between 1 and 72 months after needle biopsy.¹²

Metastatic disease of liver is more common than primary cancer of liver. This study tried to evaluate the role of fine needle aspiration cytology in the diagnosis of liver malignancy and to compare the results of FNAC with micro histology of space occupying lesions of liver and find out the predictive value of cytology in the diagnosis of metastatic liver malignancy.

METHODS

Study was carried out on 64 patients admitted to the Gastroenterology Ward of Sheikh Zayed Hospital Lahore with space occupying lesions (SOL). Patients with a history of bleeding tendency, low platelet count and prothrombin time prolonged more than 2 seconds than the control were excluded from the study. All the patients also underwent liver function tests, Hepatitis screening, and tumor marker tests (Alpha feto – protein and CEA). Lesions were aspirated under ultrasound guidance using 18 – gauge lumber puncture needle. The aspirate was used to make slides are cytological study and some of the aspirate was preserved in 10% formalin to make a cell block (microhistology) for histological examination. The cytological material was categorised as benign or malignant and an attempt was made to reach a definitive diagnosis. The diagnosis was compared with the clot using histological technique.

RESULTS

Predictability of cytology and histology in detecting metastatic malignancy of liver is tabulated (Table 1). It was observed that on the basis of cytological examination 13 cases were classified as benign and 52 as malignant while on histological basis 11 cases were categorised as benign and 50 as malignant.

Table 1: *Predictability of cytology and histology in detecting metastatic malignancy of liver.*

Types	Cytology	Histology
Benign	13	11
Malignant	52	54

The histological examination showed that 54 out of 65 cases were diagnosed as malignant and 11 as benign. Among these, 52 were picked up as malignant on cytology while none of the benign cases were reported as malignant. Diagnosis on cytology showed 32 cases of metastatic adenocarcinoma, 7 case of melanoma, 8 cases of metastatic spindle cell sarcoma and 5 cases of unclassified malignant neoplasm.

The sensitivity, specificity, positive predictive value, and negative predictive value of cytology were 96.3%, 100%, 100%, and 84.6% respectively (Table 2).

Table 2: *Comparison between cytological and histological diagnosis in metastatic space occupying lesion of liver. Predictability of cytology in detecting and classifying malignancy.*

Diagnosis	Cytology	Histology
Metastatic adenocarcinoma	32	37
Metastatic melanoma	7	8
Metastatic spindle cell carcinoma	8	7
Un classified	5	2
Total	52	54

On histology, a final diagnosis on haemotoxylin and eosin stained slides could be reached in 52 out of 54 malignant lesions. Among these 54 metastatic lesions 37 were adenocarcinomas. There were 8 cases of metastatic melanoma, 7 of metastatic spindle cell carcinoma and 2 unclassified malignant neoplasms (Table 2).

DISCUSSION

The role of liver biopsy in the diagnosis and management of liver disease is a controversial issue, even among hepatologists¹³. A diagnostic liver biopsy may be helpful in otherwise unexplained liver disease, especially in cases with controversial or unexplainable patterns of laboratory findings. Histology is the only reliable method for assessment of necro-inflammatory activity and malignancy.¹⁴

Predictability of cytology and histology in detecting metastatic malignancy of liver showed that on the basis of cytological examination 13 cases were classified as benign and 52 as malignant while on histological basis 11 cases were classified as benign and 50 as malignant. Our study is in contrast with a study showed that on combined cytohistological co-

relation, 17 (34%) out of these 19 (38%) cases could be subtyped. Sensitivity of cytological smears and cell blocks in subtyping of malignancy was 72.3% and 82.9%, respectively. Combined cytohistological diagnosis was found to be significantly better than isolated cytological and cell block diagnosis. Study reported that cytological examination alone may fail to pinpoint the type of the tumour.¹⁵

Our study demonstrated that diagnosis on cytology showed 32 cases of metastatic adenocarcinoma, 7 case of melanoma, 8 cases of spindle cell sarcoma and 5 unclassified malignant tumours. The cytology could provide correct diagnosis in 80.8% cases. The sensitivity specificity, positive predictive value, and negative predictive values, were 96.3%, 100%, 100%, and 84.6% respectively. However a study by Bolgova et al. reported that the sensitivity of cytological examination of aspirate in establishing a diagnosis was 90%, specificity was 88%, positive predictive value 99% and negative predictive value as 41%¹⁶. Another study reported that sensitivity of both cytological and histological diagnostics was about 80%. The sensitivity could be raised to 89% by combining the two methods.¹⁷

A study by Drug et al. found that liver biopsy is essential to establish a histological diagnosis and to identify metastatic lesions.¹⁸ A group of workers also found that the histological confirmation of benign and malignant liver tumors by ultrasound – guided fine needle biopsy is considered as a step forward in the overall management of liver tumours. However another study reported that the accuracy of cytology was 88.7%. False – negative rates of malignancy were 11.7% for cytology and 16% for histology.⁹

It was *concluded* that aspiration cytology is accurate in detecting malignancy as compared to histological techniques. However when combined both cytological and histological diagnosis increases the diagnostic sensitivity.

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