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Original Research Paper

Role of FNAC in Metastatic Liver Diseases

Medical Science

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Mehnaz Chowdhary — Consultant Pathology , J&K Health services

Shiffali sarngal — Demonstrator, Department of Forensic medicine GMC Jammu

Kuldeep Singh — Professor ,Department of Pathology, GMC Jammu

ABSTRACT

Background: *Liver is the most common site for metastatic diseases accounting for 25% of all metastasis to solid organs.*

AIM: *To asses the diagnostic reliability of FNAC and analysis of cytomorphological smear patterns of metastatic liver diseases.*

Material and methods: *A Prospective study on fifty ultrasonography or CT scan proved liver metastasis patients from cytology section of Pathology Department of Govt. Medical College Jammu .*

Results: *Cytological diagnosis consisted of Adenocarcinomas in 25 cases (50%); squamous cell carcinomas in 9 cases (18%); small cell carcinomas in 3 cases (6%); malignant melanoma, carcinoid, lymphoma, papillary carcinomas in 2 cases (4%) each and clear cell carcinoma, epitheloid leiomyosarcoma and follicular carcinoma in one case (2%) each.Cytohistological Correlation could be ascertained in only 9 cases; 6 cases of AdenoCarcinoma, 2 cases of squamous cell carcinoma and one case of lymphoma.*

Conclusion: *FNAC is very useful in the diagnosis of metastatic liver diseases.*

Introduction

Liver is involved in many non-neoplastic and neoplastic diseases and is the most common site for metastatic diseases accounting for 25 % of all metastasis to solid organs[1]. The diagnosis of various hepatic mass lesions is a common clinical problem and their appropriate clinical management depends on accurate diagnosis. Fine needle aspiration cytology is safe, cost effective and highly accurate in the diagnosis of metastatic liver diseases with minimal trauma to patient. The differential diagnosis of hepatic mass includes:-primary liver tumors (benign or malignant), metastatic deposits, congenital or acquired cysts, abscesses and granulomas[2]. Majority of FNAs of liver masses prove to be metastatic malignancies[3]. The common diseases that can metastasize to liver are carcinomas of lung, colon, pancreas, breast, stomach accounting for 24.8%, 15.5%, 10.9%, 10.1% and 6.1% respectively of all the patients with metastatic diseases. Ovarian, Endometrial, Prostate, Urothelial Carcinomas, Gall Bladder, Kidney, Cervix and melanomas are less frequent sources of metastasis each accounting for four percent or less[4].

FNAC is safe, non-surgical, minimally invasive and accurate diagnostic procedure requiring only few minutes to complete and diagnosis can be made on the same day. It is less expensive, more readily accessible, more accurate and obviates the surgical procedure

Patient and method:

This was a Prospective study performed on ultra sonography or CT scan proved liver metastasis patients; referred to cytology section of Pathology Department of Govt. Medical College Jammu from patients admitted in medicine, ENT and surgery departments in GMC Jammu. In each instance, demographic detail of the patients was obtained. This was followed by evaluation of the relevant investigations. A brief clinical history and general physical examination along with abdominal examination was carried out. The approach area was cleaned with the antiseptic solution and during suspended respiration needle was introduced percutaneously into the hepatic lesion under image (ultrasound or CT) guidance in the Department of Radiodiagnosis and Imaging, GMC Jammu. Ultrasound being the most commonly used modality in our case series. The site of entry of needle was through lower thoracic or upper abdominal wall carefully chosen to provide the easiest and most direct possible access to the target. The needle was passed through the normal liver parenchyma between the capsule and the lesion to reduce the risk of hemorrhage into the peritoneal cavity. The cytological material was obtained using 22 gauge, 90mm lumbar puncture needle introduced into the lesion under ultrasound guidance. The aspirated material was discharged on slides and four to six smears were made. Two smears were immediately fixed in 95% alcohol and stained with Pappinacolaou stain and others were air dried and stained with May-Grunwald Giemsa stain .The stained smears were examined in detail and results were further correlated with histological findings wherever available.

Results:

A total of 50 cases of metastatic lesions of liver were subjected to FNAC. Patients age ranged from 11 to 80 years; out of which 28 were females (56%) and 22 were males (44%). Cytomorphologically lesions were categorized into benign (4%) and malignant (96%).

Table 1: Distribution of different types of lesions

CYTOLOGICAL DIAGNOSIS	NUMBER	PERCENTAGE
ADENOCARCINOMA	25	50
SQUAMOUS CELL CARCINOMA	9	18
CARCINOID	2	4
MALIGNANT MELANOMA	2	4
SMALL CELL CARCINOMA	3	6
CLEAR CELL CARCINOMA	1	2
PAPILLARY CARCINOMA	2	4
FOLLICULAR CARCINOMA	1	2
EPITHELOID LEIOMYOSARCOMA	1	2
LYMPHOMA	2	4
TUBERCULOSIS	2	4

Adenocarcinomas was the most common metastatic lesions accounting for 25 cases (50%). Primary sites of Adenocarcinomas was gall bladder 11 (44%), colon 4 cases (16%), pancreas 3 cases(12%), rectum , prostate and lung 1 case each(4%) , primary was unknown in 4 cases (16%).

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In most cases, the common primary site of metastatic Adenocarcinomas was gall bladder and FNAC smears demonstrated cells arranged in acinar clusters as well as individually scattered depicting moderate to marked pleomorphism, abundant mucinous cytoplasm and hyperchromatic nuclei.

In colonic adenocarcinomas which were present in 4 cases, FNAC smears demonstrated linear strips of columnar cells with elongated nuclei and prominent nucleoli in a necrotic background. In the present study, a total of 9 cases were diagnosed as metastatic squamous cell carcinomas with primary sites of Oesophagus (3 cases), larynx (2 cases), lungs (1 case) and unknown in 3 cases. FNA smears demonstrated tumour cells arranged in single, pleomorphic, keratinized and undifferentiated cluster of uniform cells with rigid cytoplasm in a necrotic and inflammatory background.

Two cases of carcinoid were diagnosed in the present study. The smears demonstrate uniform, round to oval shaped cells arranged singly as well as in clusters and having salt and pepper nuclei with eosinophilic granular cytoplasm. Malignant melanoma was present in only 2 cases. FNAC smears demonstrated uniform polygonal to pleomorphic single cells with prominent nucleoli; intranuclear cytoplasm inclusions; thick cytoplasm sometimes with pigment. Small cell carcinomas were seen in 3 cases. The primary site for all these three cases was lung. Cytological examination of the aspirate shows dispersed cells and clusters of small cells with hyperchromatic nuclei, scant cytoplasm, indistinct small nucleoli and strippled chromatin.

In the present study, 2 cases were of papillary carcinomas with primary being in thyroid gland in one case and unknown in the other. In papillary carcinoma with primary site thyroid, FNA smears demonstrated tumour cells with occasional tumour giant cells in a necrotic background.

There was one case of clear cell carcinoma of the kidney metastasizing to liver. FNA smears demonstrate tissue fragments with discohesive cells adhering to strands of pink stroma with abundant vacuolated cytoplasm, enlarged pleomorphic nuclei, with variable N:C Ratio. Epitheloid leiomyosarcoma of duodenum metastasizing to liver was seen in one case. FNA smears demonstrate polygonal cells and some spindle cells arranged in fascicles as well as singly scattered with cigar shaped nuclei.(Table 1)

Discussion:

Most metastatic neoplasms to the liver are carcinomas, most of which are adenocarcinomas of various origins. The malignant tumour observed in an otherwise normal liver is metastatic until proven otherwise[5]. The gall bladder, lung, colon, pancreas, breast and stomach are the most common primary sites of hepatic metastasis but malignant tumour from any site can metastasis to liver. Elevated level of serum alkaline phosphatase and multiple nodules on imaging of the liver are characteristic findings. However single metastasis may also occur particularly with colorectal carcinoma, carcinoid tumours and renal cell carcinomas6. In a substantial proportion of patients which varies from 10-40%, the liver lesion may be the first manifestation of disease & FNAC is used not only to diagnose cancer but also to recognize the site of origin. In our study also majority of the lesions proved to be malignant i.e., (96%) and benign (4%).

In the present series FNAC smears among the malignant were interpreted as Adenocarcinoma (50%); Squamous Cell Carcinoma (18%); small cell carcinoma (6%); carcinoid, malignant melanoma, lymphoma, papillary carcinomas and tuberculosis (4% each); clear cell carcinoma, follicular carcinoma, epitheloid leiomyosarcoma (2% each).Thus adenocarcinomas were the most common malignant lesions in our study.

In a similar study done by Das et al in 19977, out of 61 metastatic liver lesions; adenocarcinomas were 70%; followed by small cell carcinomas 9.8%, followed by leiomyosarcoma 5%, followed by 3.27% each of malignant non-hodgkins lymphoma, melanoma, paraganglioma and germ cell tumours and 1.64% each of squamous cell carcinomas, neuroendocrine tumours and un-differentiated carcinomas/ soft tissue sarcoma.

Tao et al11 1979 studied 13 metastatic liver diseases out of which 10 were metastatic Adenocarcinomas which constitute 76% followed by one case each of metastatic oat cell carcinoma, metastatic adenoid cystic carcinoma and squamous cell carcinoma constituting 8% each.

In a study done by Ahuja et al1 in 2007; out of 25 cases metastatising to liver Adenocarcinomas were most common including 68% followed by neuroendocrine carcinomas, poorly differentiated carcinomas and carcinomas not otherwise specified 8% each followed by small cell carcinoma and renal cell carcinomas 4% each. Thus Adenocarcinomas were the most common metastatic malignancy to liver in above mentioned studies also.

Conclusion:

FNAC is very useful tool in the diagnosis of metastatic liver diseases. It is quick, safe, simple, reliable, cost effective and accurate method. The recognition of the distinct cytomorphological features, in conjuction with radiological findings, make Ultrasound guided FNAC useful primary diagnostic modality. The most important advantage is in classifying the various types of metastatic liver diseases and in most of the cases to ascertain the primary site of tumour.

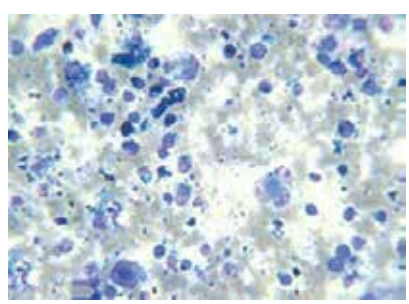

Figure1: Metastatic malignant melanoma cells showing pleomorphism with well defined cytoplasm , eccentric nuclei , multinucleated cells with prominent nucleoli, melanin pigment in cytoplasm and macrophages in the background.

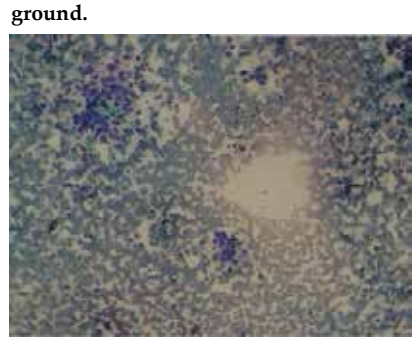

Figure 2:Metastatic Adenocarcinoma. Clusters of tumor cellsshowing marked cellular and nuclear pleomorphism. Cells have scant cytoplasm with coarse nuclear chromatin and prominent nucleoli.

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