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Fine needle aspiration cytology diagnosis of liver diseases in the University of Maiduguri teaching hospital. Maiduguri

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Summary

The study is aimed at classifying liver diseases diagnosed by fine needle aspiration cytology (FNAC) in our environment and to emphasize the importance of the procedure for management of our patients. Forty-two patients were referred by the physicians for fine needle aspiration cytology diagnosis in Histopathology Department, University of Maiduguri Teaching Hospital between January 2001 and December 2003. There were 30 males and 12 females (2.5:1) with mean age of 44.7 years. The peak age is in the 5th decade of life. The commonest hepatic disease is primary hepatic malignancy, which accounted for 78.6% (33 patients); 3 suspicious of malignancy, one case each of metastatic carcinoma, amoebic liver abscess; liver storage disease and large cell dysplasia. The technique has gained popularity in our center because it is cheap, convenient, minimally invasive, quick and has high precision in obtaining samples. We therefore recommend this procedure in centers where liver diseases are common as a means of initial investigation.

Keywords: *Liver diseases, diagnosis, FNAC, Maiduguri.*

Résumé

Le but de cette étude était de classifier les maladies de foie diagnostiquées par la technique aspiration cytologique a l'aide d'une aiguille mince dans notre environnement et l'importance de cette technique dans le menagement de nos patients. Quarante-deux patients etaient referes by les medecins pour cette procedure de diagnostie dans le departement d 'histopathologie du Centre Universitaire Hospitalier de Maiduguri de Juin 2001 a Decembre 2003. Il y avait 30 males et 12 femeles(2.5:1) avec la moyenne d'age de 44.7 ans. Le sommet de l'age est a la cinquantaine.L'hépatite du foie le plus commun est l'hépatite primaire maligne estimé a 78.6% (33 patients); 3 cas suspicieux, un cas chaconne de carcinome métastique ,de l'abcess améobique de foie, accumulation au foie et large cellule de dysplasie. Cette technique de diagnostie a gagner la popularité de notre centre a cause du cout réduit, l'invasion minimale, sa rapidité et la précision de cette technique pour obtenir l'échantillon. Nous avons recommandé cette technique aux centres ou ces maladies sont currente.

Introduction

The Liver is one of the largest organs in the body that is assaulted by a wide range of systemic disorders. Hepatitis B virus is the commonest cause of chronic hepatitis, liver cirrhosis and hepatocellular carcinoma in Nigeria [1]. The diagnosis and classification of some of the liver lesions especially tumours can be made by Fine Needle Aspiration Cytology (FNAC), which is now gaining popularity among both the Clinicians and Pathologists in our hospital and other hospitals in Nigeria [2,3]. The spectrum of liver cell tumours would include benign, primary malignant tumours of the liver and metastases to the liver, which are epithelial or non-epithelial. In Africa, hepatocellular carcinoma is the most common malignancy in men [5]. Ultrasound guided FNAC (USSG-FNAC) gives good precision in obtaining adequate samples for diagnosis and classification of liver diseases.

This study aims at classifying some of the liver diseases in our environment and at emphasizing the importance of FNAC procedure for quick diagnosis and proper management of our patients.

Materials and methods

This was a 3-year prospective study of 42 cases with liver diseases between January 2001 and December 2003, at the University of Maiduguri Teaching Hospital. During the first year of the study, all the patients were referred by the Physicians to histopathology department for cytopathological diagnosis. The Pathologist examined the patients and performed the blind percutaneous FNA. After the first year of the study, USSG-FNAC was introduced and the Pathologists and Radiologists examined the patients and explained the procedure to them and a verbal consent was obtained. The procedure was performed in supine position. The right hypochondrium was cleaned with 70% alcohol. No local anaesthetic was required. The Radiologist scanned the liver using Ultramark 9 ATL Doppler ultrasound machine fitted with 3.5MHz curvilinear transducer to localize the mass. The vascularity of the masses was assessed using the Doppler color flow. A fine-needle was then introduced under ultrasound guidance by the pathologists to take the liver aspirate. Each of the patients had one or two aspirates obtained using a 10 ml plastic syringe fitted with a 21-gauge disposable needle. The procedure took fraction of a minute. The aspirated contents of the needle were blown on to a glass slide. Four slides smear were made, two were immediately fixed in 95%

ethyl alcohol for about 30 minutes and the remaining two were air-dried and then fixed. The patients were observed for any complications such as haemorrhage and closely monitored on the ward for three hours. The slides were stained with Haematoxylin and Eosin (H&E), and Giemsa stains respectively and examined with light microscope power of X400. Periodic Acid Schiff (PAS) stain was used to demonstrate Glycogen in the patient with glycogen storage disease. The microscopic diagnostic interpretation includes:- Benign, malignant, suspicious of malignancy, inflammatory (amoebic abscess).

Results

FNAC of the liver accounted for 6.1% of all FNAC within the study period. Table-1 shows the age and sex distribution of patients that had FNAC diagnosis. There were 30 males and 12 females, giving a ratio of 2.5:1 respectively. The mean age was 44.7 years. The peak age incidence was the 5th decade of life, although hepatic disease is predominantly from the 4th to 7th decades of life.

Table 1: Age and sex distribution of 42 patients with liver disease diagnosed by FNAC at the UMTII from January 2001 to December 2003

Age group (yrs)	Sex		Total (%)
	Male	Female	
0-9	0	1	1 (2.4)
10-19	1	1	2 (4.8)
20-29	2	1	3 (7.1)
30-39	6	2	8 (19.0)
40-49	8	3	11 (26.2)
50-59	7	1	8 (19.0)
>60	6	3	9 (21.4)
Total	30	12	42 (100)

M F = 2.5:1

Table 2: Classification of hepatic diseases diagnosed by FNAC at the UMTII from January 2001 to December 2003.

Diagnosis	Frequency	%
Malignancy (HCC)	33	78.6
Suspicious of malignancy	3	7.1
Metastatic carcinoma	1	2.4
Large cell dysplasia	1	2.4
Amoebic liver disease	1	2.4
Liver storage disease	1	2.4
Inadequate samples	2	4.8
Total	42	100

Table 2 shows the classification of hepatic disease. Primary hepatic malignancy was the commonest, accounting for 78.6 % (33 patients). There were three patients with suspicion of malignancies and one patient each with metastatic carcinoma, amoebic liver abscess, liver

storage disease and large cell dysplasia. Two of the patients had inadequate aspirated samples despite two attempts of aspiration. There was no case of any complication such as haemorrhage or sepsis.

Cytopathological features of hepatic diseases

Hepatocellular carcinoma.

The smear is cellular and composed of monotonous picture of polygonal or polyhedral to pleomorphic cells. There is moderate to scanty amount of granular eosinophilic cytoplasm and nuclei are ovoid to bizarre with centrally located prominent eosinophilic macronucleoli. There is a background of tumour necrosis.

Large cell dysplasia.

The smear is composed of hepatocytes with cellular enlargement, nuclear pleomorphism and multinucleation, but the nucleo-cytoplasmic ratio remains normal.

Liver storage disease.

Smear is composed of hepatocytes with abundant acidophilic, vacuolated and granular. The nucleo-cytoplasmic ratio is normal. Periodic Acid Schiff (PAS) is strongly positive for glycogen.

Amoebic liver disease

The smear shows trophozoites and cysts of *Entamoeba histolytica* which are identified by May-Grunwald-Giemsa (MGG) stain.

Discussion

The FNAC technique in the diagnosis of hepatic disease began 3 years ago in our center, although FNAC of tumours has been in existence for the past 9 years. The demand for this technique has gained popularity especially among the Clinicians and Pathologists who found it very useful in the management of patients. Since the introduction of this procedure, the demand has increased because of its low cost [FNAC is N450.00 (US \$3.00) whilst the cost of biopsy is more than N5,000.00 (US \$38)], convenience, quick, little or no complication and high sensitivity. Hepatic lesions especially hepatocellular carcinoma are commonly seen from the 4th decade of life with male predominance. The findings of this study agree with a previous study in Ile-Ife, Nigeria [2].

The commonest indication for FNAC of the liver is primary hepatic malignancy, which accounted for 78.6% of all patients with liver diseases in our study. Other workers documented a higher percentage in their studies [2,6]. Three patients were diagnosed by cytology as suspicious of malignancy, which may require further investigation. One of the patients later had FNAC under ultrasound guide and adequate aspirate was obtained and diagnosed malignant. Another case of 18-month-old girl was finally diagnosed with hepatoblastoma, which is the commonest primary hepatic malignancy in children, but it is a rare condition.

Hepatic metastasis from other sites is the commonest malignant tumour among the Caucasians [4]. In our series we recorded only one such case and this may not be a true reflection of metastatic carcinoma to the liver, since most patients present with the primary malignancy rather than secondary and do not have to undergo FNAC as part of investigation.

The only case of amoebic liver abscess was clinically missed as hepatocellular carcinoma. However, USSG-FNAC revealed "anchovy sauce" fluid macroscopically, which microscopically confirmed presence of *Entamoeba histolytica* trophozoites. The definitive studies for identifying amoebic liver abscesses are hemagglutinin or gel diffusion studies [7]. A suspected case of liver storage disease, which was diagnosed by cytology in an 11-year old girl was a difficult case. The patient had two episodes of USSG-FNAC of the liver; a special stain (Periodic Acid Schiff) was used to demonstrate glycogen and was strongly positive. This patient also had some musculoskeletal abnormalities and therefore needs further investigation.

The diagnosis of large cell dysplasia was made in a 29-year old woman by FNAC. This lesion can either be hepatocellular adenoma or focal nodular hyperplasia, both are benign focal lesions. The two lesions cannot be differentiated by FNAC but by tissue histology [8]. These lesions usually occur in women of reproductive years and particularly hepatocellular adenoma that is thought to be associated with long-term use of steroid contraceptives [9,10]. However the patient had a medical history of oral contraceptive pills for more than two years.

Two of the patients had dried aspirate after two attempts of FNA by blind percutaneous procedure. In such group of patients, liver cirrhosis could have been ruled out by USSG-FNA technique, which was not done. Liver cirrhosis may present with inadequate or no aspirate by FNAC due to fibrosis as documented by Olasode *et al* [2].

The two major areas of difficulties in classifying hepatic diseases by FNAC are differentiation of benign hepatic nodules from well differentiated hepatocellular carcinoma and identification of malignant cells as cholangiocarcinoma, hepatocellular carcinoma or metastasis [11,12]. Therefore further investigations such as tissue biopsy are needed for further assessment. FNAC should be employed as the initial method of investigation in the developing world due to inadequate medical facilities for diagnosis and management of patients with hepatic diseases.

In conclusion, FNAC technique in the diagnosis and classification of liver disease has gained popularity in our center because of its low cost, convenience, quick, little or no complications and good precision in obtaining adequate samples. We therefore enjoin hospitals where liver diseases are common to embrace this diagnostic

procedure. This will go a long way in improving the quality of managing our patients.

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