

Correlation Between Ultrasound Findings And Ultrasound Guided-Fine Needle Aspiration Cytology In The Diagnosis Of Hepatic Lesions: A Nigerian Tertiary Hospital Experience

H Nggada, A Ahidjo, N Ajayi, S Mustapha, U Pindiga, A Tahir, W Gashau, M Khalil

Citation

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Abstract

Objective: The aim of this study is to correlate between ultrasound guided fine needle aspiration cytology and ultrasound alone in the diagnosis of focal hepatic lesions.

Methods: The study was prospective and was carried out between January 2002 and December 2005 at the University of Maiduguri Teaching Hospital. Abdominal ultrasound and ultrasound guided-fine needle aspiration cytology of forty-seven patients with clinical diagnosis of hepatic focal lesions was carried out.

Results: Out of 47 patients diagnosed by USSG-FNAC, 37 were malignant, six as suspicious of malignancy, two as amoebic liver abscess and one case as metastatic carcinoma. The ultrasound diagnosed 43 cases as hepatoma (Malignant), 2 as abscesses, one case each as metastatic and liver cirrhosis. Malignancy (Hepatoma) is the commonest finding by both ultrasound and USSG-FNAC. Ultrasound diagnosed the abscesses, liver cirrhosis and metastatic carcinoma correctly as USSG-FNAC.

Conclusion: In conclusion, USSG-FNAC may or may not be superior to ultrasound alone in the diagnosis of hepatic focal lesions.

INTRODUCTION

Fine needle aspiration cytology is a major indicative procedure in the diagnosis of liver malignant tumour^{1,2}. Ultrasound-Guided fine needle aspiration cytology (USSG-FNAC) in the diagnosis of hepatocellular carcinoma showed a high sensitivity in identifying focal liver lesions. The diagnostic technique yields adequate pathological materials in majority of cases³. The advantages of ultrasound-Guided fine needle aspiration cytology in the diagnosis of liver diseases cannot be overemphasized. The advantages of this technique are its high diagnostic accuracy and low cost, thereby rendering the older technique of blind percutaneous biopsy using a coarse needle obsolete³. Fine needle aspiration technique of liver masses has been in practice for

about 5 years in our center but the introduction of USSG technique in the diagnosis of hepatic lesions began 4 years ago.

The aim of this study is to correlate between ultrasound guided fine needle aspiration cytology and ultrasound alone in the diagnosis of focal hepatic lesions.

PATIENTS AND METHODS

This was a 4-year prospective study of 47 cases with suspected hepatic focal lesion between January 2002 and December 2005, at the University of Maiduguri Teaching Hospital. All patients were referred by the Physicians to the radiology department for ultrasound diagnosis and then to the histopathology department for cytopathological

diagnosis where the Pathologists requests the procedure to be done under ultrasound guide. The Pathologists and Radiologists examined the patients and explained the procedure to them and a verbal consent was obtained. The procedure does not require clotting profile because of the small bore needle. The procedure was performed in supine position. The right hypochondrium was cleaned with methylated spirit. No local anaesthetic was required. The Radiologist scanned the liver using Ultramark 9 ATL Doppler ultrasound machine fitted with a 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 lesion 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 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 slides were stained with Haematoxylin and Eosin (H&E), and Giemsa stains respectively and examined with light microscope. The microscopic diagnostic interpretation includes: - Inflammatory, Malignant and suspicious of malignancy.

RESULTS

A total of forty-seven patients were studied with a mean age of 47.04 ± 14.24 years and range between 14 and 75 years. The peak age incidence is between 40 and 59 years age groups (Fig 1).

The study revealed more males 38(80.9%) patients with hepatic diseases than females 9(19.1%). The results of the ultrasound diagnosis and the USSG-FNAC shown in table 1 and 2 respectively are the same for abscesses (4.3%), Metastatic carcinoma (2.1%), and Liver cirrhosis/ acellular smear (2.1%). 43 (91.5%) cases diagnosed by USSG-FNAC. The remaining 6 (12.8%) cases were reported as suspicious of malignancy by USSG-FNAC. Chi-square has shown a significant statistical difference ($p=0.000$, $df=12$) between ultrasound diagnosis and USSG-FNAC in the diagnosis of hepatic lesions. Malignancy (Hepatoma) is the most commonly diagnosed hepatic lesion in this study (table 1 and 2).

Autopsy results were only available for 10 patients as hepatocellular carcinoma. All the 10 cases were diagnosed as Malignant (hepatoma) by both ultrasound and USSG-

FNAC.

Figure 1

Figure 1: Showing the age group distribution of 47 patients with hepatic lesions.

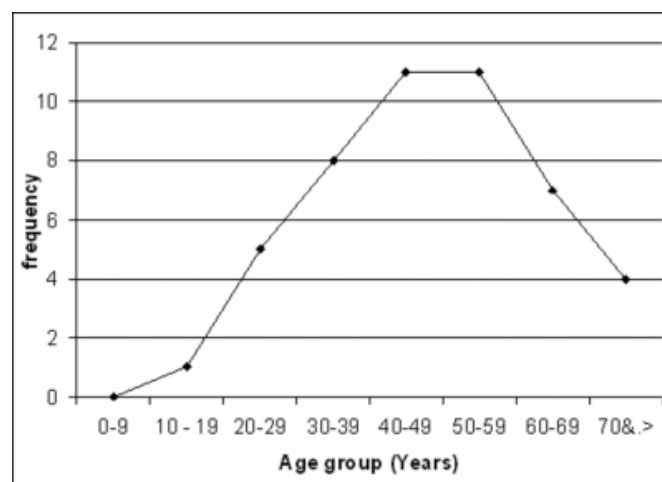


Figure 2

Table 1: The frequency distribution of Ultrasound diagnosis of 47 patients with hepatic focal lesions.

USS Diagnosis	Frequency	Percent
Metastasis	1	2.1
Liver cirrhosis	1	2.1
Abscess	2	4.3
Hepatoma	43	91.5
Total	47	100

Figure 3

Table 2: The frequency distribution of Ultrasound guided-fine needle aspiration cytology diagnosis of 47 patients with hepatic focal lesions.

USS Diagnosis	Frequency	Percent
Metastatic carcinoma	1	2.1
Acellular smear	1	2.1
Amoebic abscess	2	4.3
Suspicious of malignancy	6	12.8
Malignancy	37	78.7
Total	47	100

DISCUSSION

Hepatic diseases are common in our environment and it affects relatively all age groups with the peak age in the 5th and 6th decades of life and male, female ratio of 3.6:1. It has become a routine practice over the past four years in our hospital for any patient suspected with hepatic lesion to undergo a FNAC technique rather than the wider conventional Menghini or Vim Silverman needle biopsy⁴. The initial procedure was blind percutaneous and has yielded a high sensitivity of 92% and diagnostic accuracy with no complications of all tumours by the same co-author⁵. Huber, et al⁶ recorded a sensitivity of 93% and specificity of 87% of ultrasound guided-fine needle aspiration biopsy

The USSG-FNAC technique was introduced a year latter to localize the tumour so that a high precision of the lesion aspirate is obtained. The technique was done once or twice for most of the patients and adequate aspirate was obtained for cytopathological diagnosis. USSG-FNAC of the liver plays more roles in diagnosis and classification of liver disease than ultrasound alone, as it requires greater precision to reach diagnostic accuracy⁷. Chen et al⁸ in their series recorded an overall accurate diagnostic rate of 89.9% of the 250 cases of malignant tumours and benign diseases of the liver.

Despite the high diagnostic accuracy, sensitivity and specificity by the FNAC and USSG-FNAC in some studies^{5,9,6,7,8}, the histologic diagnosis still remains the gold standard. Majority of our patients did not have the tissue biopsy and those that died in the hospital had no post mortem examination. However, 10 of the dead patients had post mortem liver biopsy and histologic diagnosis which all correlate with the USSG-FNAC and Ultrasound as malignant. This means that both USSG-FNAC and ultrasound alone have a very high specificity and sensitivity in diagnosis of hepatic malignancies. The reasons why post mortem biopsy was not done in most of the patients because of the negative attitude of some families, which is often encouraged, by doctors and other members of the health team. Other factors include cultural reasons and religious taboos. These factors often lead to discharge of majority of our patients against medical advice and lost to follow-up.

In our series, both USSG-FNAC and ultrasound alone accurately diagnosed all metastasis, liver cirrhosis, and inflammatory lesions while USSG-FNAC alone has a diagnostic accuracy of 86% of all malignant lesions.

Acellular smear means dried aspirate by FNA, which occurred liver cirrhosis as in this case. Olasode et al⁹ also documented similar finding of dried aspirate in liver cirrhosis by FNA of the liver. However, ultrasound gives fairly specific appearances in hepatocellular carcinoma¹⁰ the 10 patients were all malignant

There were six cases suspicious of malignancy diagnosed by USSG-FNAC, which may be attributed to inadequate specimen by the aspirator as the procedure is done once or twice. Other factors include hyperplastic liver cell nodules; liver cell adenomas and well-differentiated hepatocellular carcinomas cannot be differentiated with accuracy in the aspiration smear, thereby necessitating histopathologic diagnosis. Unfortunately none of the six cases had histologic diagnosis, however, if all the six cases were malignant then there is no significant statistical difference between USSG-FNAC and ultrasound alone. But on the other hand if the six cases were not malignant, then there is a significant statistical difference ($p=0.000$, $df = 12$). Because of the failure of these six cases by means of histologic diagnosis the superiority of one of the two diagnostic tests in this study cannot be determine.

The demerit of FNA procedure is the differentiation of benign and non-neoplastic hepatic nodules from well-differentiated hepatocellular carcinoma, and the identification of obviously malignant cells as hepatocellular carcinoma, cholangiocarcinoma or metastasis. This necessitates a histological appraisal^{11,12}.

In our series, there was no complication of the procedure recorded

In conclusion, USSG-FNAC may or may not be superior to ultrasound alone in the diagnosis of focal hepatic masses. However, the histological diagnosis remains the gold standard for any hepatic lesions.

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CORRESPONDENCE TO

Dr. H.A.Nggada. P.O. Box 316 Maiduguri. Borno State. Nigeria E-mail: hanaggada@yahoo.com GSM- 0802 358 6233

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Author Information

H.A. Nggada, FMCPath., FICS.

Department Of Histopathology, University Of Maiduguri Teaching Hospital

A. Ahidjo, FWACS.FMCR

Department Of Radiology, University Of Maiduguri Teaching Hospital

N.A. Ajayi, MBBS

Department Of Medicine, University Of Maiduguri Teaching Hospital

S. K. Mustapha, FMCP

Department Of Medicine, University Of Maiduguri Teaching Hospital

U. H. Pindiga, FWACP

Department Of Surgery, University Of Maiduguri Teaching Hospital

A. Tahir, FWACS.FMCR

Department Of Radiology, University Of Maiduguri Teaching Hospital

W. Gashau, FWACP

Department Of Medicine, University Of Maiduguri Teaching Hospital

M. I. A. Khalil, MD, PHD, FICS

Department Of Histopathology, University Of Maiduguri Teaching Hospital