

Ultrasound-guided fine-needle aspiration cytology of gallbladder masses – A solution to diagnostic dilemmas

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ABSTRACT

Background: Advances in medical technology has revolutionized patient care. Ultrasound (USG)-guided fine-needle aspiration cytology (FNACs) is enlarging the realm of diagnostic cytology. This merger has increased the diagnostic accuracy especially in inaccessible body sites like the gall bladder (GB) masses. Impalpable, deep, and small lesions are now no longer a dilemma, thanks to image-guided FNACs. **Objectives:** The objective of the study was to study the ultrasound-guided FNACs of GB masses for a 10 year period and evaluate the efficacy of ultrasound-guided FNACs in GB lesions. **Materials and Methods:** USG-guided FNACs were collected and analyzed over a 10 year period (2007–2016) in the Department of Pathology North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong. This is a retrospective study and is in accordance with the ethical standards as laid by the Helsinki Declaration, 2000. Descriptive statistics were used for analysis. **Results:** The age ranges from 27 to 83 years and the mean age was 53.2 years. The majority were females which constituted around 94.3% (50) and males constituted around 5.7% (3). Out of all the adequate cases (42 in number) that were evaluated, 37 (88%) were malignant and 5 (12%) were benign and inflammatory; 11 out of 53 cases (20.8%) were inadequate. **Conclusion:** Although FNAC is established as a reliable diagnostic method, our study of 10 years has further proven that this test has stood the test of time, and with our high diagnostic yield and in the hands of a dedicated radiologist and cytopathologist, it will prove to surpass its expectations.

KEY WORDS: Gallbladder; Adenocarcinoma; May Grunwald Giemsa

INTRODUCTION

In this day and age when science and technology are advancing, so also diagnostic dilemmas continue to put us in a corner and in the context of gall bladder (GB) masses ultrasound (USG)-guided fine-needle aspiration cytology (FNAC) is no longer in its infancy and has proven its worth in this diagnostic

realm. This diagnostic tool has been immensely useful for diagnosis, staging, and treatment purposes in the evaluation of GB lesions. Development in skills and technology has led to this modality becoming more widely used as the first choice of investigating an intra-abdominal mass or lesion such as liver, pancreas, and GB. This has led to a marked reduction in the time of hospital stay and faster diagnosis and treatment or referral to the concerned specialty.

Available data have revealed that GB cancer is high in states such as Uttar Pradesh, Bihar, Orissa, West Bengal, and Assam.^[1] This study will provide a bird's eye view of the lesions, we encounter in this region. USG-guided FNAC of GB masses has been proven to be a procedure which has to replace tissue diagnosis by

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extensive surgery thus reducing the risk a patient has to undergo in the course of the investigation of the disease and improving the quality of life.^[2] USG-guided, FNAC sensitivity was found to be 95.45% in diagnosing pure adenocarcinoma GB.^[3]

MATERIALS AND METHODS

This is a retrospective study in which all the USG-guided FNAC's were collected and analyzed over a 10 year period (2007-2016) in the Department of Pathology North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong. All FNAC's were performed after availing informed consent from each patient in accordance with the strict institutional protocol. The procedures followed were in accordance with the ethical standards as laid by the Helsinki Declaration, 2000. All fine-needle aspirations were performed under USG guidance maintaining strict aseptic precautions in the Department of Radiology NEIGRIHMS by an experienced radiologist. A Logiq P5 USG system (General Electric Healthcare, Milwaukee, USA) with 3.5–5 MHz curvilinear and 8–10 MHz linear transducers along with Toshiba Diagnostic ultrasound, Japan Made, and 3–5 MHz curvilinear and 7–11 MHz linear transducers was used for localizing the lesion and needle guidance. 22–23 G needles or spinal needles fitted to disposable 10 or 20 cc syringes were used depending on the depth of the lesion. The slides were then sent to the Department of Pathology for staining by May-Grunwald Giemsa and Papanicolaou staining methods and reported by a team of experienced pathologists.

Statistics

A descriptive analytical statistic was used to describe the findings of this study. Cytological diagnosis was analyzed under headings of benign and malignant GB pathologies.

RESULTS

All the FNACs of GB masses were performed under ultrasound guidance. The age ranges from 27 to 83 years and the mean age was 53.2 years. The majority were females which constituted around 94.3% (50) and males constituted around 5.7%.^[3] Out of all the adequate cases (42 in number) that were evaluated, 37 (88%) were malignant and 5 (12%) were benign and inflammatory; 11 out of 53 cases (20.8%) were inadequate [Table 1].

Common presenting symptoms include loss of appetite, abdominal pain, and jaundice. 24 (65%) of the malignant cases were adenocarcinoma [Figure 1b and d] GB (including both poorly differentiated and moderately differentiated adenocarcinoma) out of which one is a papillary adenocarcinoma and one is a mucin-secreting

adenocarcinoma [Figure 1a], 6 (16.2%) cases were poorly differentiated carcinoma with one infiltrating the liver, 3 (8%) belonged to the poorly differentiated malignancy category, 1 (2.7%) turned out to be metastatic hepatocellular carcinoma, 1 (2.7%) was cholangiocarcinoma [Figure 1c], and 1 (2.7%) was a squamous cell carcinoma, and 1 (2.7%) is a metastatic poorly differentiated carcinoma. The age range of malignant lesions was as young as 37 years–83 years.

5 (12%) cases were benign of which 1 (20%) was acute on chronic cholecystitis, 2 (40%) were normal and with no

Table 1: Distribution of adequate cytological slides according to final cytological diagnosis

Diagnosis	No. of cases (%)
Malignant cases (n=37)	
Adenocarcinoma GB	24 (65)
Poorly differentiated carcinoma	6 (16.2)
Poorly differentiated malignant category	3 (8)
Metastatic hepatocellular carcinoma	1 (2.7)
Cholangiocarcinoma	1 (2.7)
Squamous cell carcinoma	1 (2.7)
Metastatic poorly differentiated carcinoma	1 (2.7)
Total	37 (100.0)
Benign and inflammatory (n=5)	
Acute on chronic cholecystitis	1 (20)
Normal and no malignancy detected	2 (40)
Inflammatory cystic lesion	1 (20)
Benign	1 (20)
Total	5 (100)
Inadequate	11 (20.8) (out of 53)

GB: Gallbladder

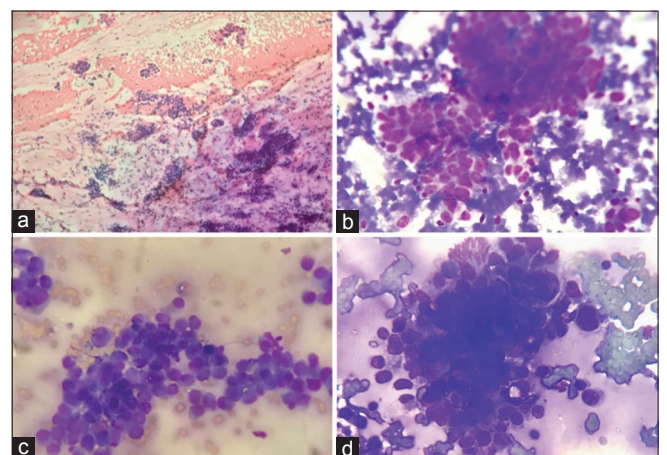


Figure 1: Ultrasound-guided fine-needle aspiration cytology (FNAC) slides in the gallbladder (GB). (a) 10 × (hematoxylin and eosin stain) photomicrograph showing guided FNAC smears of mucin-secreting adenocarcinoma GB. (b and d) 40 × (May-Grünwald Giemsa [MGG] stain), photomicrograph showing guided FNAC smears of adenocarcinoma GB. (c) 40 × (MGG stain), photomicrograph showing FNAC smears of cholangiocarcinoma

malignancy detected, and 1 (20%) was an inflamed cystic lesion, and 1 (20%) was benign. Out of 42 adequate cases, only two had histological correlation which correlated 100% in which one case was proven to be acute on chronic cholecystitis and another was “malignancy not detected” by both cytological and histopathological methods.

DISCUSSION

USG-guided FNAC may be used as a routine procedure in the assessment of intra-abdominal lesions and intrathoracic lesions as a result of its high sensitivity and specificity.^[4] Gallbladder lesions are relatively difficult to detect and diagnose due to its deep location and malignancy can easily be missed due to signs which are similar to benign lesions. According to the National Registry Programme of India, the incidence of GB carcinoma in North India is 4.5 cases/100,000 in males and 10.1 cases/100,000 in females^[5] and so there is a need to diagnose it as early as possible so as to allow for early intervention and treatment for improving the quality of life. In our study, we observed that the majority of our patients were females. The predominant lesions were found to be malignant over the benign and inflammatory lesions. Few cases were found to be inadequate. Under the malignant category, adenocarcinoma was found to be the most common morphologic pattern diagnosed with papillary and mucin-secreting adenocarcinoma being the variants. Other neoplasms include metastasis, cholangiocarcinoma, squamous cell carcinoma, and poorly differentiated carcinoma. Under the benign category the cases that were diagnosed were acute on chronic cholecystitis, cystic lesion and others were found to be normal with no malignancy detected. 2 cases had histological correlation which correlated 100%.

In our study, most of the patients were females which correlated with the study of GB masses by Iqbal *et al.*^[2] who had a male to female ratio of 1:3.5 and also with a study by Bhartiya *et al.*^[6] In our study, we found the inadequacy rate to be 20.8% which is similar to a study by Handa *et al.*^[7] A study by Jha *et al.*^[8] also showed the rates of inadequacies for guided FNAC is in the range of 2.8–33.6%.^[8] In the present study, we found that the age ranges from 27 to 83 years and mean age was 53.2 years which is similar to a study by Handa *et al.*^[7] which observed their age range of 24–84 years and a mean age of 52 years and they also documented an 8% of inflammatory cases while we noted in our study a 12% of benign and inflammatory cases. In this study, we found that out of all malignant cases we studied, majority (65%) of the cases were adenocarcinoma GB which was similar to a study by Yadav *et al.* which also found that adenocarcinoma GB comprises 86.7% of the diagnosis^[9] which is similar to a study by Bhartiya *et al.*^[6] Squamous cell morphology is quite rare in GB carcinoma and reported to be 7%^[10] by Roa *et al.* whereas in our study

it was found to be 2.7% which was similar to the study by that of Richa *et al.*

Despite our small study group, yet we got a high yield of malignant GB lesions, thus emphasizing the importance of guided aspiration for early diagnosis with minimal risk and facilitating early intervention. This study again serves to prove the safety and cost-effectiveness of ultrasound-guided procedures. Our limitations are that it is a small group of patients in which further studies may be performed with a larger group which will give us more insight into the utility of the diagnostic procedures. In our study, we found that there was low histological examination and correlation as some of these GB masses were not operable or patient refused surgery or loss to follow-up or taken treatment in their respective hometown, and these are similar to a study of deep-seated lesions by Jha *et al.*^[8]

CONCLUSION

USG-guided FNAC has stood the test of time and has once again proven to be a safe, cost-effective, and accurate procedure in cases of deep inaccessible sites like the GB where the cases can come late in the disease progression as shown by our high malignant diagnostic rates. Hence, by this method, we can avoid the hazards of open/laparoscopic surgery and general anesthesia and reduce the risks to the ailing patient. We can safely conclude that GB masses are no longer an enigma as USG-guided FNAC has provided a solution to the dilemma and further studies with a larger group may be done to see the interventional and supportive therapies and methods on how to improve the quality of life of these patients after getting an early diagnosis of a malignant lesion.

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