



FINE NEEDLE ASPIRATION CYTOLOGY OF GALLBLADDER LESION AND ITS HISTOPATHOLOGICAL CORRELATION

Pathology

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ABSTRACT

Background: Due to increasing trend of gallbladder carcinoma in India, early diagnosis of gallbladder lesion has become essential. Ultrasound guided fine needle aspiration (FNAC) has emerged as an effective diagnostic tool for precise diagnosis of deep seated lesion.

Aim: It is to determine the accuracy of ultrasound guided fine needle aspiration cytology and its histopathological correlation.

Materials and Methods: This retrospective study for a span of 3 years (April 2017– March 2020) in department of pathology and radiology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand. Ultrasound guided fine needle aspiration cytology of gall bladder and their histopathological findings were compared.

Results: The study included 76 cases and lesions were categorized on FNAC into inadequate, benign, suspicious of carcinoma, carcinoma gallbladder (most common in present study) and metastatic carcinoma. The most common pattern FNAC of neoplasm was sheets and acini with predominance of columnar cell and adenocarcinoma being the most common malignancy. The histopathological diagnosis was available in 65 cases and sensitivity of ultrasound guided FNAC was 98.3% in malignant cases

Conclusion: Image guided FNAC plays an important role in diagnosis of gallbladder lesions with minimal complications. In addition to early confirmation and pre-operative diagnosis of malignancy, it allows for morphologic evaluation according to WHO classification, which is necessary for prognostication of the disease.

KEYWORDS

Fine needle aspiration cytology, gall bladder carcinoma, histopathology

INTRODUCTION

Carcinoma of gallbladder (CaGB) ranks as a sixth most common malignancy of gastrointestinal tract and the most common malignant tumor of biliary tract with poor prognosis. Adenocarcinoma of gall bladder represents 80-95% of biliary tract cancers. Carcinomas of gall bladder is more frequent in females than males (3-4:1 ratio), and over 90% of the patients are 50 years of age or older at the time of diagnosis. It is much more common in some Latin American countries and part of Asia than in the United States^[1]. The pre-operative diagnosis of CaGB is difficult owing to vague symptoms and the relative inaccessibility of gallbladder to biopsy. Further, it clinically mimics benign gallbladder diseases and usually escapes detection until late in its course^[2]. Early diagnosis with potential surgical intervention is not always possible^[3]. Extensive resection is the best available therapeutic option for long-term survival, but the majority of patients present in an advanced stage and are inoperable^[4]. Thus, there exists a strong rationale for the consideration of adjuvant therapy^[5]. The prognosis for patients with CaGB depends primarily on the extent of disease and histological type^[6]. Various tissue diagnostic procedures have been utilized to confirm the clinical and radiological diagnosis, including bile cytology, needle aspiration and biopsy of gallbladder^[7]. Ultrasound (US) guided fine needle aspiration cytology (FNAC) is a safe, quick and precise diagnostic procedure for early diagnosis and management of gallbladder cancer in developing countries^[8].

The present study of 76 cases was, therefore, conducted to study the role of FNAC in the diagnosis of gallbladder lesions with its histopathological correlation.

MATERIAL AND METHODS

This is a retrospective study held between April 2017 to March 2020, a span of 3 years. US guided FNAC has been done in department of radiology in Rajendra institute of medical sciences, Ranchi by pathologist under aseptic condition. The 18/20 gauge lumen puncture needle with 10ml syringe was used for FNA in localization of needle was done by radiologist under US guidance and aspiration by pathologist. Maximum 2 passes were done for any lesion and at least 6-7 slides were prepared. In case of inadequate material, repeat FNAC had been done. Smear were stained by leishman & giemsa and papanicolaou and studied and reported. The relevant clinical, laboratory and radiological findings are noted for all the cases. All the smears were assessed for adequacy of smears, cellularity and arrangement of

cells. Most of the patient whose FNAC was done had cholecystectomy later and the specimen was sent to department of pathology. The hematoxylin & eosin sections were viewed by pathologist and the final diagnosis made.

RESULTS

A total of 76 cases of US guided FNAC were reported between the year April'17 to March'20. Number of male patients were 23(30.3%) and number of female patients were 53(69.7%); hence the female to male ratio was 2.3:1. Female to male ratio in case of CaGB is 2.9:1 (Table. 1) The youngest patient was 28 years old and the oldest was 80 years old. Most common affected age group was 5th to 6th decade with 30 cases contributing 39.5% of total cases. (Table. 2)

Table. 1: Gender distribution in Gallbladder lesion.

Lesion	Male (%)	Female (%)
Inadequate	1	1
Benign lesion	4	6
Suspicious of carcinoma	1	3
Carcinoma gallbladder	14	40
Metastatic carcinoma	3	3
Total	23(30.3%)	53(69.7%)

Table. 2: Age distribution of gallbladder lesion.

Age (Years)	Total case(76)	Percentage (%)
21-30	4	5.2
31-40	6	7.9
41-50	24	31.6
51-60	30	39.5
61-70	10	13.2
71-80	2	2.6

Table. 3 shows broad categorization of the gallbladder lesions on FNAC. Out of 76 cases of US guided FNAC 2 were inadequate, benign lesion was 10(13.2%) and primary carcinoma of gallbladder was maximum(71%) in which adenocarcinoma of gallbladder was most common(96.3%) which includes adenocarcinoma not otherwise specified(NOS), papillary, mucinous and signet ring cell adenocarcinoma. Squamous cell carcinoma of gallbladder constitute 1.85%.

Table. 3: Gallbladder lesions on Fine needle aspiration cytology

Lesion	Total case(76)	Percentage (%)
Inadequate	02	2.6%
Benign lesion	10	13.2%
Suspicious of Carcinoma	04	5.2%
Carcinoma Gallbladder	54	71%
Adenocarcinoma NOS	47	96.3%
Papillary adenocarcinoma	02	
Mucinous Adenocarcinoma	02	
Signet ring cell Adenocarcinoma	01	
Squamous cell Carcinoma	01	1.85
Poorly differentiated Carcinoma	01	1.85
Metastatic Carcinoma	06	08%

Out of 76 case only 65 had histopathological follow up. Table 4 shows the cytological diagnosis and cytohistopathological correlation in cases in which histopathology was done.

1 benign lesion was diagnosed as adenocarcinoma later on histology, 1 suspicious of carcinoma diagnosed adenoma later on histology and 1 adenocarcinoma NOS diagnosed as adenomatous hyperplasia later on histology.

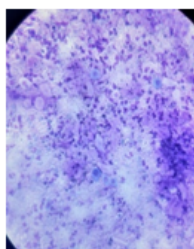
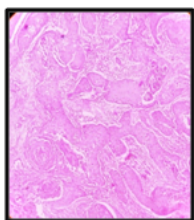
False positive = 2

False negative = 1

ForCaGB sensitivity of FNAC=98.3%

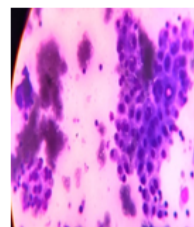
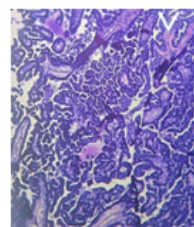
Table. 4: Cytohistologic correlation of 65 cases

Cytologic Diagnosis	Histopathological diagnosis	Accuracy
Benign lesion (5)	Chronic cholecystitis-4 Adenocarcinoma - 1	80%
Suspicious of carcinoma (4)	Adenoma - 1 Adenocarcinoma - 3	75%
Carcinoma gallbladder(53)		99.6%
Adenocarcinoma NOS (46)	Adenomatous hyperplasia - 1 Adenocarcinoma - 45	97.8%
Papillary Adenocarcinoma(2)	Papillary adenocarcinoma - 2	100%
Mucinous Adenocarcinoma(2)	Mucinous adenocarcinoma - 2	100%
Signet ring cell Adenocarcinoma(1)	Signet ring cell Adenocarcinoma - 1	100%
Squamous cell Carcinoma (1)	Squamous cell carcinoma - 1	100%
Poorly differentiated Carcinoma (1)	Poorly differentiated carcinoma - 1	100%
Metastatic carcinoma (3)	Metastatic carcinoma-3	100%

Fig1**(a) L&G(10x)****(b) H&E (10x)**

(a)FNAC of gallbladder with squamous cell carcinoma showing tadpole cells with keratinization & ink dot nuclei

(b)Squamous cell carcinoma of gallbladder in histopathology

Fig 2**(a) L&G(10x)****(b) H&E(10x)**

Adenocarcinoma gallbladder (sheets and acini with predominance of columnar cells)

DISCUSSION

Carcinoma of gallbladder ranks as a sixth most common malignancy of gastrointestinal tract and is more frequent in females than males (3-4:1 ratio), and over 90% of the patients are 50 years of age or older at the time of diagnosis. Adenocarcinoma of gallbladder represents 80-95% of biliary tract cancers^[1]. The present study also shows the female are more affected than male (2.9:1 ratio) in CaGB (71% of all Gallbladder lesions) and most common affected age group as 5th to 6th decade and adenocarcinoma is most common CaGB.

Clinical presentation of gallbladder malignancy and benign gallbladder disease is almost similar and most of the times it is masked by chronic cholecystitis^[2,9]. The rising incidence and high mortality rate of biliary tract cancers demands urgency to search for early diagnosis.

Establishing diagnosis in early stage of the disease is difficult^[2]. FNAC is helpful in pre-operative decisions regarding the type and extent of surgical procedure and subsequent treatment, especially in cases considered to be inoperable due to extensive invasion by the tumor. It obviates the need of laparotomy in advanced cases and in patients who are poor surgical candidates^[10]. Role of FNAC in diagnosis of CaGB has been documented in the literature largely in late 80's and 90's. FNAC under image guidance has been considered superior in terms of diagnostic yield and sample adequacy result in to higher sensitivity^[7].

FNAC has been found to be a useful modality for the diagnosis of CaGB with sensitivity reported from 74% to 100% and inadequacy rate of 4-29%^[11]. False negativity is a well-known limitation of FNAC, which could be attributed to incorrect sampling, necrosis or fibrosis. In gallbladder malignancies false negativity of 11-41% has been documented^[10]. The present study shows sensitivity for carcinoma gallbladder in guided FNAC of 98.3% and false negative rate of 1.7%.

Uncommon variants of poor prognosis, classified by WHO, such as mucinous carcinoma, squamous cell carcinoma, small cell carcinoma and undifferentiated carcinoma can be diagnosed on cytology material. Papillary adenocarcinoma shows predominantly papillary fragments and corresponds to well differentiated category with histopathological concordance. Mucinous adenocarcinoma is characterized by presence of more than 50% of extracellular mucin. Pure squamous cell carcinomas are exceptional^[1].

As far as predictors of outcome in CaGB are concerned, histologic type, grade and stage of the disease are considered useful parameters in various series^[6,12]. Thus, subtype characterization and classification according to grade of the tumor are essential on cytology for guiding the clinician in patient management and prognostication. WHO (2010) classifies CaGB in to various morphologic subtypes with their

associated prognostic relevance^[6].

CONCLUSION

To conclude, the present study is forevaluating the role of US guided FNAC in diagnosis of CaGB. Cytology plays a significant role in the pre-therapeutic workup of gallbladder carcinomas. In addition to early confirmation and pre-operative diagnosis of malignancy, it allows for morphologic evaluation according to WHO classification, which is necessary for prognostication of the disease.

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