

Ultrasound Guided Fine Needle Aspiration Cytology of Gallbladder Lesions Suspected to be Carcinoma Gallbladder: Experience of a Tertiary Care Hospital

Rupali Bargotra, Rajesh Sharma*

Abstract

Gallbladder carcinoma is the most common biliary tract malignancy in the world. Radiological investigations are helpful in diagnosing the gallbladder diseases especially carcinoma in most of the cases, but confirmation of diagnosis requires cytopathological correlation. We have undertaken a study on 29 patients, who underwent ultrasound guided FNAC for evaluation of gallbladder lesions suspected to be carcinoma gallbladder. 82.75% of patients had malignancy or suspicion of malignancy and 10.34% patients had abscesses, while in 6.9 % patients FNAC was inconclusive. Adenocarcinoma (NOS) was the most common diagnosis and was found in 62.6 % of patients. Poorly differentiated carcinoma, cytology suspicious of malignancy and abscesses were present in 7 % of patients each. Papillary carcinoma and squamous cell carcinoma were only seen in 3.44 % patients each. None of the patients in our study developed any minor or major complications during the procedure. A precise cytological examination is required not only to diagnose or rule out gallbladder malignancy, but also for prognostication of these carcinomas.

Keywords

Ultrasound Guided, FNAC, Cytology, Adenocarcinoma (NOS) Gallbladder, Poorly Differentiated Carcinoma Gallbladder, Papillary Adenocarcinoma Gallbladder, Squamous Cell Carcinoma Gallbladder

Introduction

Gallbladder carcinoma was first described in literature by Des toll in 1777 and it is the most common biliary tract malignancy in the world (1). It is a rare cancer in western world and in Americas with incidence of 0.5% to 1.15%, while in eastern world, its incidence is as high as 10% (2). North Indian, American Indian and Chilean-Mapuche populations have very high rates of incidence (3). North Indians are eight times more commonly affected than south Indians (4). Its incidence is more in females compared to males (5). The non-specific signs and symptoms and lack of clinical suspicion lead to delayed

diagnosis in gall bladder carcinoma and it is associated with poor prognosis (6, 7). Gallbladder carcinoma is rarely discovered at operable stage and has extremely low (1%) 5 year survival rate even after surgical intervention (8). Radiological investigations like ultrasound, CT & MRI are helpful in diagnosing the gallbladder diseases especially carcinoma in most of the cases, but confirmation in these cases requires cytological or histopathological correlation. Ultrasound guided fine needle aspiration cytology (FNAC) is an easily accessible diagnostic tool for the accurate diagnosis of gallbladder

From The: PG Dept. of Pathology & *PG Department of Radiodiagnosis, GMC Jammu

Correspondence to : Dr. Rajesh Sharma, Associate Professor, PG Department of Radiodiagnosis, GMC Jammu

masses in most tertiary care centres. The present study was conducted to see the role of FNAC in diagnosing gallbladder lesions and to try to give cytomorphological classification of these lesions.

Materials & Methods

This study was done in the Department of Pathology in collaboration with Department of Radio diagnosis of Govt. Medical College Jammu after Necessary IEC clearance. Patients who underwent the ultrasound guided FNAC for gallbladder masses in last three years constituted the study group. Patients who had primary liver or pancreatic tumours were excluded from the study. Prothrombin time (PTI) was done in all patients and the ones with deranged PTI were not taken up for the procedure. Ultrasound of abdomen was done in all patients prior to the FNAC. An informed consent was taken from all patients who underwent the procedure. Ultrasound guided FNAC was done in supine position. Lumbar puncture (LP) needle of 22G was used for FNAC. The localization of the needle in the lesion was done by the radiologist under ultrasound guidance, and the aspiration was done by the pathologist. A maximum of two passes were made in these lesions. Six smears / slides were prepared in each case. Few of the smears were air dried and then subsequently stained with MGG (May Grunwald's Giemsa Stain). Other wet smears were fixed immediately in a jar containing 95% alcohol, and subsequently stained with Papanicolaou stain. The clinical

details, laboratory investigations and radiological findings were noted in the requisition form of cytology for further reference during cytopathological examination. At the time of reporting of each case, all smears were taken into consideration before making a final diagnosis. Patients were diagnosed and categorised as adenocarcinoma not otherwise specified (NOS), poorly differentiated carcinoma, papillary adenocarcinoma, squamous cell carcinoma, suspicious of malignancy, abscess or inadequate for reporting / diagnosis. The smears which showed highly atypical cells, but the cytological material was not enough to give definite diagnosis of carcinoma were labelled as suspicious of malignancy. The smears which showed haemorrhage, necrosis, absent/ insufficient epithelial cells were labelled as inadequate.

Fig.1 FNA Smear Depicting Adenocarcinoma (NOS) Gallbladder (MGG stain)

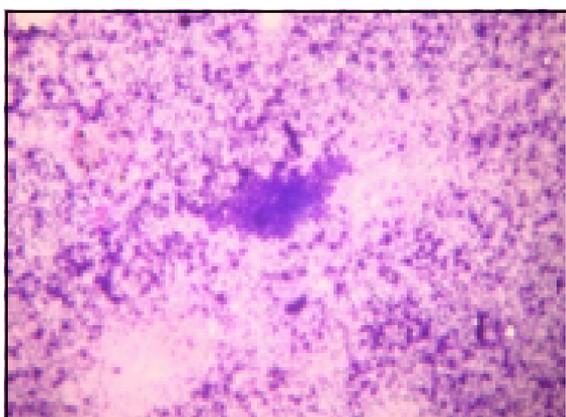


Fig 2. FNA Smear Depicting Papillary Adenocarcinoma Gall Bladder (MGG stain).

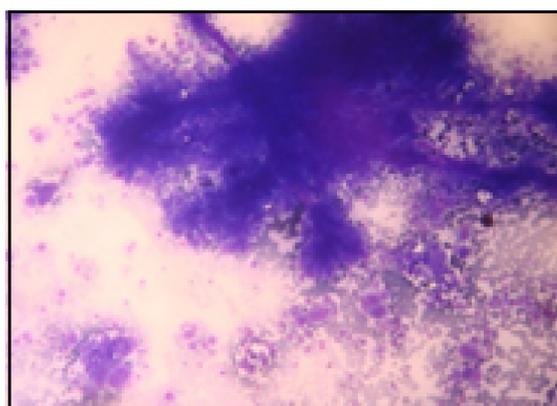


Fig.3 FNA Smear Depicting Squamous Cell Carcinoma Gallbladder (MGG stain).

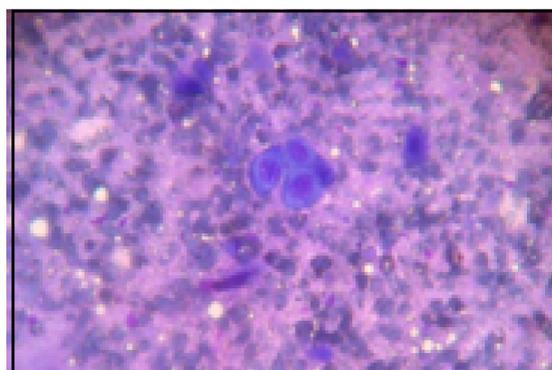


Table No.1 Age Wise Distribution

Age	No. of cases (n=29)	Percentage
0-20	0	0
21-40	5	17.24
41-60	13	44.82
61-80	8	27.58
81-100	3	10.34

Table No.2 Sex Wise Distribution

	No of cases(n=29)	Percentage
Male	7	24.13
Female	22	75.86

Table No.3 Histo-pathological Distribution

Cytological Diagnosis	No. of cases (N=29)	Sex	
		Male	Female
Adenocarcinoma, NOS	18	4	15
Poorly differentiated Carcinoma	2	0	2
Papillary adenocarcinoma	1	0	1
Squamous cell carcinoma	1	1	0
Suspicious for malignancy	2	1	1
Abscess	3	1	2
Inadequate for diagnosis	2	1	1

Results

A total of 29 patients were included in this study (table 1). Out of these, approx. 3/4th of the patients (75.86 %) were female and rest of the 1/4th patients (24.13 %) were males (Table 2). Maximum percentage i.e. 44.82 % of the patients were in the age group of 41-60 years. This was followed by 61-80, 21-40 and 81-100 year age groups having 27.58 %, 17.24% & 10.34% patients respectively (Table 1). Out of total of 29 patients, 82.75% (24) patients had malignancy or suspicion of malignancy. carcinoma (NOS) was the most common diagnosis and was found in 62.6 % of patients (Table 3) (Fig.1). 10% of the smears were inadequate for diagnosis and were advised repeat aspiration. Poorly differentiated carcinoma, cytology suspicious of malignancy and abscesses were present approx. in 6.9 % of patients each. Papillary carcinoma and squamous cell carcinoma were only seen in 3.44 % patients each (Fig.2&3). Two patients who turned out to be abscesses, had history of fever and increased infective markers. None of the patients in our study developed any minor or major complications during the procedure.

Discussion

Gallbladder carcinoma is a disease of female preponderance and a disease of not only elderly, but also of middle age group of 41-60 years as seen in many studies including ours (9, 10). A large percentage of our patients (82.75%) had malignancy or suspicion of malignancy and it was comparable to other studies Das *et al* and Handa *et al* (9, 11). Adenocarcinoma (NOS) was the commonest type and was observed in 62.6 % of our patients as compared to 96.3% in study by Handa *et al* (9). Most of the gallbladder cancers are discovered at an unresectable stage and in these cases confirmation of cancer by ultrasound guided FNAC is done. Ultrasound guided FNAC can also be used as an important tool for preoperative diagnosis & staging (9). An important prognostic factor considered in gallbladder cancer is the histological subtype, as it is required for management (12, 13). Papillary adenocarcinoma is a considered to have a good prognosis, although it was only found in a very small percentage of our patients. Squamous cell carcinoma was present in 1% and 2% of the cases in studies by Rao *et al* and Chandra *et al* respectively,

which was similar to our study (13, 14). Squamous cell carcinoma carries a poor prognosis and is only diagnosed at advanced stage when it has invaded surrounding structures. Therefore a precise cytological examination is required not only to diagnose or rule out gallbladder malignancy, but also for prognostication of these carcinomas (13).

Ultrasound guidance helps in guiding needle tip to the altered echogenicity area in gallbladder for better yield for cytology. Single punctures during FNAC have reported adequacy rate of 62.7% by Krishnani *et al* (15). Repeat aspirations performed by experienced specialists with better visualization and approach on imaging increases the sensitivity of the test (16). In our study, about one fourth of the patients required two punctures. Complications are very rare on FNAC as was observed in our study and in other studies (17). Needle tract tumour seedling is considered an extremely rare complication. One of the pitfalls of this study was inadequate aspiration in 2 of the patients, despite repeated attempts. Ultrasound guided FNAC of gallbladder lesions has rapidly gained a place in the diagnosis & management of all suspicious gallbladder lesions due to its safe, rapid, cost effective nature and added advantage of being nonsurgical & day care procedure (18). Well defined cytological criteria coupled with precise radiological localization increase the sensitivity of the test to arrive at a diagnosis (19).

Conclusion

Ultrasound guided FNAC of gallbladder is a very safe, inexpensive and useful procedure for cytopathological diagnosis of gallbladder lesions suspected to be carcinoma gallbladder on radiological and imaging studies.

References

- Albores-Saavedra J, Kloppel G, Adsay NV, Sripa B, Crawford JM, Tsui WM, et al. Carcinoma of the gall bladder and extra hepatic bile ducts. In: Bosman FT, Carneiro F, Hruban RH, Theise ND, editors. World Health Organization Classification of Tumours of the Digestive System. 4th ed. Geneva: WHO Press; 2010. pp. 263-78.
- Iqbal M, Gondal KM, Qureshi AU, Tayyab M. Comparative Study of Ultrasound Guided Fine Needle Aspiration Cytology with Open/Laparoscopic Biopsy for Diagnosis of Carcinoma Gallbladder. *J Coll Phys Surg Pak* 2009;19 (1): 17-20.
- Misra S, Chaturvedi A, Misra NC, Sharma ID. Carcinoma of the gallbladder. *Lancet Oncol* 2003; 4:167-76
- Dhir V, Mohandas KM. Epidemiology of digestive tract cancers in India IV. Gallbladder and pancreas. *Indian J Gastroenterol* 1999;18:24-28
- Lazcano-Ponce EC, Miquel JF, Muñoz N, Herrero R, Ferrecio C, Wistuba II, et al. Epidemiology and molecular pathology of gallbladder cancer. *CA Cancer J Clin* 2001;51:349-64
- Dutta U. Gallbladder cancer: Can newer insights improve the outcome? *J Gastroenterol Hepatol* 2012; 27:642-53.
- Kanthan R, Senger JL, Ahmed S, Kanthan SC. Gallbladder cancer in the 21st century. *J Oncol* 2015; 2015:967472.
- Misra S, Chaturvedi A, Misra NC, Sharma ID. Carcinoma of the gallbladder. *Lancet Oncol* 2003; 4:167-76.
- Handa U, Nanda A, Mohan H, Kochhar S, Atul Sachdev. Cytologic diagnosis of gallbladder lesions - A study of 150 cases. *Indian J Surg* 2010; 72:181-184.
- Wanebo HJ, Vezeridis MP. Carcinoma of the gallbladder. *J Surg Oncol* 1993; 3:134-139.
- Das DK, Tripathi RP, Bhambhani S, Chachra KL, Sodhani P, Malhotra V. Ultrasound-guided fine-needle aspiration cytology diagnosis of gallbladder lesions: a study of 82 cases. *Diagn Cytopathol* 1998; 8:258-64.
- Kanthan R, Senger JL, Ahmed S, Kanthan SC. Gallbladder cancer in the 21st century. *J Oncol* 2015; 2015: 967472.
- Chandra S, Chandra H, Shukla S K, Sahu S. Fine-needle aspiration cytology of gallbladder with an attempt of cytomorphological classification. *Cytojournal* 2019; 16: 1. doi: 10.4103/cytojournal.cytojournal_5_18. e Collection 2019.
- Roa JC, Tapia O, Cakir A, Basturk O, Dursun N, Akdemir D, et al. Squamous cell and adenosquamous carcinomas of the gallbladder: Clinicopathological analysis of 34 cases identified in 606 carcinomas. *Mod Pathol* 2011; 24:1069-78.
- Krishnani N, Dhingra S, Kapoor S, Pandey R. Cytopathologic diagnosis of xanthogranulomatous cholecystitis and coexisting lesions. A prospective study of 31 cases. *Acta Cytol* 2007; 51:37-41.
- Tao LC, Donat EE, Ho CS, McLoughlin MJ. Percutaneous fine-needle aspiration biopsy of the liver. Cytodiagnosis of hepatic cancer. *Acta Cytol* 1979; 23:287-91.
- Ramdas A, Chopra R. Diagnostic accuracy of fine needle aspiration cytology of liver lesions. *J Cytol* 2003; 20:121-3.
- Barbhuiya MA, Singh TD, Poojary SS, Gupta S, Kakkar M, Shrivastav BR, et al. Gallbladder cancer incidence in Gwalior district of India: Five-year trend based on the registry of a regional cancer centre. *Indian J Cancer* 2012;49:249-57
- Kumar N, Singhal P, Agarwal A, Khan MA. Cytopathological diagnosis of gallbladder mass and mural thickening based on imaging findings: A prospective study of 51 cases. *J Cytol* 2015; 32:234-7.