International Journal of Biomedical Research
ISSN: 0976-9633 (Online); 2455-0566 (Print)
Journal DOI: 10.7439/ijbr
CODEN: IJBRFA

Original Research Article

Ultrasonographic features of Carcinoma gall bladder

Dhruba Borpatra Gohain* and Sima Malakar

Department of Radiodiagnosis, Assam Medical College & Hospital, Dibrugarh, India

***Correspondence Info:**
Dr. Dhruba Borpatra Gohain,
Department of Radiodiagnosis,
Assam Medical College & Hospital, Dibrugarh, India
E-mail: drd_gohain@yahoo.com

Abstract

The aim of this study is to evaluate the ultrasonographic findings of carcinoma Gall bladder in proved cases.

The study was done retrogradely in proved carcinoma GB cases, which were done by FNAC. A total of 40 cases were evaluated, out of which 30 were female & 10 cases were male. GB mass was found in 87.5% cases where as 12.5% cases reveals wall thickening. Complete GB fossa replacement by mass was found in 17% & partial replacement was found in 80% cases. Polyp like mass was found in 3% cases. Focal wall thickening was found in 60% cases & 20% was found as irregular wall thickening & rest 20% was found as uniform diffuse wall thickening. Calculi are found in 80% cases, liver infiltration in 7.5%, periportal lymphadenopathy in 20% & liver metastasis in 12.5% cases.

Ultrasonography is the initial diagnostic imaging modality though there may be considerable overlapping in the features of the benign and malignant gall bladder disease

Keywords: Carcinoma, gall bladder (GB), ultrasonography

1. Introduction

Carcinoma of gall bladder is an uncommon but not a rare disease with a poor prognosis. It is an aggressive malignancy that occurs predominantly in the elderly and it can mimic other condition both clinically and radiologically. It is the fifth most common gastrointestinal malignancy [1] & predominantly in north & eastern region of India [2].

At the time of presentation most of the cases are either locally advanced or are metastatic. With the exception of early stage cases detected incidentally at the time of cholecystectomy for gall stone disease, the prognosis for most patients is poor.

Carcinoma of the gall bladder is 2 to 3 times more common in women than men, in part due to higher incidence of gallstones in women [3]. A strong association has long been noted between gall bladder carcinoma and cholelithiasis. The incidence of carcinoma of the gall bladder is approximately seven times more common in the presence of cholelithiasis and chronic cholecystitis than in people without gallstones.

Among the imaging modalities ultrasonography is more than 90% accurate in the diagnosis of gall bladder diseases [4]. Also ultrasonography has some advantages over other diagnostic modalities. These are availability, non-invasive, lake of ionizing radiation, visualization in multiple section and cost effectiveness. Taking into consideration the advantages of ultrasonography and its application in the study of gall bladder and biliary diseases, this present study tries to depict the ultrasonographic appearance of carcinoma gall bladder in proven cases

2. Material and Methods

2.1 Study design

With the aim of studying the features of USG in carcinoma Gall bladder, the present study was performed in 40 diagnosed cases. These subjects of varying ages and both sexes were referred to the Department of Radio-diagnosis, Assam Medical College & Hospital from the various Departments suspected of having carcinoma gall bladder (on the basis of clinical data). USG guided FNAC were done on these patients & the carcinoma proved 40 cases were selected for this study. The proved cases were thoroughly examined by USG to evaluate the features & associated findings.

2.2. USG evaluation

- Abnormality in the form of mass lesion or wall irregularity. If a mass lesion was noted then its characters were evaluated i.e. whether it had a smooth or irregular margin; homogenous or heterogenous, whether the mass was projecting into the gallbladder lumen or it was totally replacing the lumen and whether there was any evidence of adjacent liver infiltration.
- Gallbladder calculus.
- Any evidence of obstructive jaundice in the form of intrahepatic biliary ductal dilatation.
- Any evidence of lymphadenopathy or ascites.
- Echo texture of the GB lesion.

3. Results and Observations

USG evaluation of gallbladder masses was carried out in 40 patients confirmed of having primary carcinoma of the gallbladder.

3.1 Distribution of cases:

Sonographic features of proved cases of Carcinoma Gallbladder:

i) Features in Gallbladder:

The majority (35 patients; 87.5%) of the cases of carcinoma gallbladder presented as gallbladder mass lesions, out of which 28 cases (80%) showed intraluminal mass lesions i. e. mass lesions partially filling gallbladder lumen. Mass in gallbladder fossa with total obliteration of gallbladder lumen was seen in 6 cases (17%). Polyp like mass having a well defined smooth surface projecting from one gallbladder wall was seen only in one case (3%).

Of the 40 proved cases of Carcinoma Gallbladder 5 patients (12.5%) presented as wall thickening. The majority i.e. 3 cases (60%) showed irregular focal wall thickening. One case (20%) showed uniform diffuse wall thickening. However it presented with other signs of malignancies viz. liver infiltration. One case (20 %) showed diffuse irregular wall thickening.

Figure A: GB fossa mass partially filling the lumen

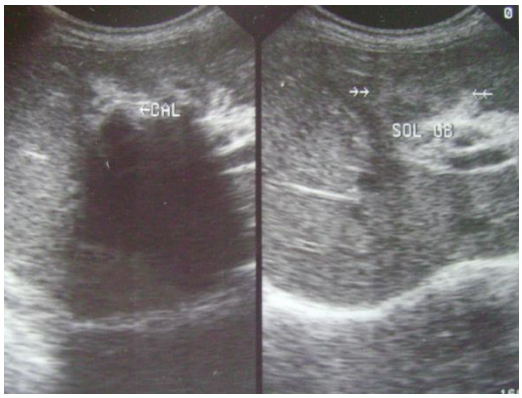

Figure B: Heterogenous mass in GB fossa with complete obliteration of GB lumen along with calculi

Figure C: focal wall thickening in GB

ii) Associated findings

Calculi with posterior acoustic shadowing were noted in 32 cases (80 %). In majority, they were embedded in the mass and not mobile.

Obstructive jaundice with intrahepatic ductal dilation was seen in 18 cases (45%), enlarged lymph nodes were present in 8 cases (20%), and liver infiltration was detected in 3 cases (7.5%) and liver metastasis in 5 cases (12.5%). Ascites was present in 3 cases (7.5%). Two cases showing liver infiltration also had calcified GB wall (porcelain gallbladder).

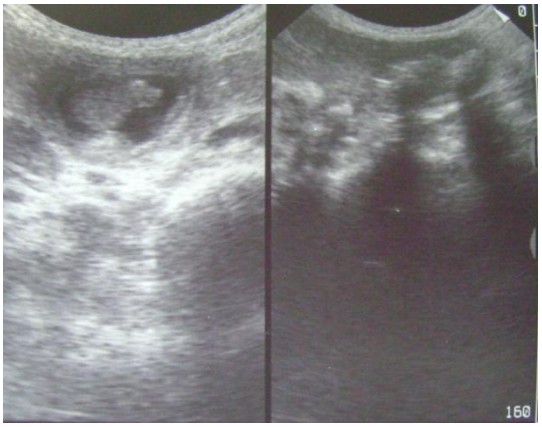

Figure D: Polypoidal growth projecting into the lumen

Figure E: Diffuse wall thickening in GB

Table 5: Sonographic Features of carcinoma Gallbladder

	No of cases	Percentage
A. Features in Gallbladder		
1. Gallbladder masses	35	87.5%
Mass replacing gallbladder lumen	6	17%
Intraluminal mass / mass partially filling gallbladder lumen	28	80%
Polyp like mass	1	3%
II. Gallbladder wall thickening	5	12.5%
Irregular (diffuse)	1	20%
Irregular (focal)	3	60%
Uniform (diffuse)	1	20%
B. Associated Findings		
Calculus	32	80%
Liver infiltration	3	7.5%
IHBRD	18	45%
Liver metastasis	5	12.5%
Enlarged lymph nodes	8	20%
Ascites	3	7.5%

iii) USG features in relation to their echogenicity in 40 cases of carcinoma gall bladder

Among the 40 cases which were proved cytologically as a carcinoma of the gall bladder, 20 cases (50%) were predominantly hyperechoic than the adjacent liver parenchyma, where as 10 cases (25%) showed predominantly hypoechoic lesion on ultrasonography. The rest 10 cases (25%) were heterogenous in echogenicity.

Table 6: Sonographic features in relation to echogenicity

	No of cases	*Percentage*
A. Features in Gallbladder		
1. Hyperechoic	20	50%
2. Hypoechoic	10	25%
3. Heterogenous echogenicity	10	25%

4. Discussion

4.1 Demographic profile

In the present study, out of 40 proved carcinoma GB, 30 were females and 10 were males, female to male ratio was 3: 1. [3]. Most of the cases were in 6th and 7th decades of life. This is in accordance with the earlier observations that carcinoma gallbladder is diagnosed most frequently in the 6th and 7th decades of life [3]

4.2 USG morphology of malignant cases

i) Features in Gallbladder

USG features of carcinoma gallbladder comprise a wide spectrum. Several authors have classified carcinoma gallbladder into three broad categories –

a) A large mass filling the gallbladder,

b) A polypoidal mass projecting into the lumen, and

c) An infiltrative type presenting as focal irregular wall thickening.

The maximum presented on ultrasonography as mass lesion with identifiable gallbladder lumen (72.5%). Out of them the commonest i. e. 37.5% were soft tissue masses which partially filled gallbladder lumen followed closely by growth projecting into the lumen of gallbladder from one of the walls (30%) and lastly came infiltrating mass i.e. wall thickening only in 4% cases [5]

Again when the ultrasonographic echogenicity of the gall bladder mass lesion is concerned, about 40% of cases were hyperechoic, 31% were hypoechoic and 29% were heterogenous [5]. In our study we found 50% cases to be hyperechoic, 25% hypoechoic and 25% heterogenous echogenicity.

ii) Associated findings

Gall stones were found in 76% of cases by Kumar et al [5]. 80% calculi are found by Weiner [6] where as 100% was reported by Raghabendra [7]. In the present series calculi were associated with 80% of the cases of carcinoma gallbladder.

Dilation of intrahepatic bile ducts was seen in 48% and ascites in 6% of cases [5]. In the present study IHBRD was seen in 45% and ascites in 6% of the cases.

Liver deposits were found in 20% patients [5]. In this study liver metastasis were noted in 12.5% of the cases. Liver infiltration was noted in 73% of cases [5]. However, in the present study liver infiltration was noted only in 7.5% of cases. Keeping in mind that this area is endemic for carcinoma gallbladder, every suspicious lesion was subjected to FNAC. Lymphadenopathy at the porta was seen in 28%, peripancreatic region in 23% and other retroperitoneal nodes in 10% [5]. However, in the

present study only 20% cases showed lymphadenopathy.

5. Summery & Conclusions

A total of 40 cases of gallbladder masses were selected for this study by Ultrasonography. The objective of this study was to evaluate the features for detection of gallbladder carcinoma using USG.

The cases were thoroughly examined and investigated regarding their location, size, appearance and associated features and the following conclusions were drawn.

Ultrasound is the initial diagnostic imaging modality though there may be considerable overlapping in the features of the benign and malignant gall bladder disease and hence often difficult to reliably distinguish between them. The gall bladder masses were classified into 2 groups.

Group I was sub- divided into 3 types:

a) Type I: Solid mass partially filling the gall bladder lumen (80%),

b) Type II: Growth projecting into gall bladder lumen (polyp like) (3%), and

c) Type III: Wall thickening (12.5%)

Group II, i.e. mass occupying the gallbladder fossa comprised 6 cases (17%).

The age of the patients varied between 40 and 85 years. Female were predominantly affected in the ratio 3:1. There was considerable overlapping of symptoms and the commonest mode of presentation was right upper abdominal pain (82%) followed by jaundice (47%).

Many lesions, including gall bladder wall thickening, benign gall bladder mass and tumefactive sludge were difficult to differentiate from gall bladder carcinoma.

Polypoid gall bladder carcinoma was also often difficult to differentiate from adenoma, inflammatory polyps or papilloma in the absence of associated features.

Infiltrative carcinoma of the gall bladder thickening has to be differentiated from acute or chronic cholecystitis, xanthogranulomatous cholecystitis and adenomyomatosis.

A low echoic zone suggestive of oedema in the gall bladder wall or the presence of perichlecystitis fluid collection indicates cholecystitis rather than carcinoma. Thickening of the gall bladder wall more than 5mm has to be considered to suggest carcinoma. Adenomyomatosis shows irregular gall bladder wall thickening and xanthogranulomatous cholecystitis also shows irregular nodular gall bladder wall thickening. Therefore diagnosis was difficult without histopathological correlation. Gall bladder carcinoma occupying the gall bladder fossa is often difficult to differentiate from a liver mass or empyema of the gall bladder.

Reference

[1] Piehler JM, Crichlow AW. Primary carcinoma of the gallbladder. *Surg Gynecol Obstet* 1978; 1 47: 929-942.

[2] ICMR 1992, Available from URL: http://www.icmr.nic.in/ncrp/ncrp_p/cancer_reg.pdf

[3] Bernard Levin, Gallbladder carcinoma. *Annals of Oncology* 1999; 10 Suppl. 4: S129-S130.

[4] Crade M., Taylor. J. W., Rosenfielad. T., D E Graafc. S. and Miniha MP. Surgical and pathologic correlation of cholecystosonography and cholecystography. *Amer. J. Roentgenol*. 1978; 131: 227.

[5] Kumar A, Aggarwal S, Berry M, Sawhney S, Kapur BM, Bhargava S. *Journal of Clinical Ultrasound: JCU* 1990, 18(9):715-720.

[6] Weiner SN, Koenigsberg M, Morehouse H, Hoffman J. Sonography and computed tomography in the diagnosis of carcinoma of the gallbladder. *AJR Am J Roentgenol*. 1984 Apr; 142(4): 735–739.

[7] Raghavendra BN. Ultrasonographic features of primary carci- noma of the galblader: Report of five cases. *Gastrointest Radiol*, 1980; 5:239-24.