Original Research Article

Imaging spectrum of morphology of carcinoma gall bladder on MDCT

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Abstract

Background: In computed tomography (CT) a normal GB wall appears as a thin rim of soft tissue density that enhances post contrast. A thickened GB wall measures > 3mm.Few cases of GB carcinoma are identified incidentally on postoperative histopathology done for causes like cholelithiasis, cholecystitis etc. USG has high sensitivity in detecting advanced lesions while CT is used for detection of early malignant lesions and staging purposes. **Aims and objectives:** To characterize the various radiological appearances of carcinoma of the Gall bladderon MDCT imaging.**Methodology**: After Ethical approval MDCT findings from 30 cases of Cytologically proven cases of carcinoma GB were studied retrospectively in the Department of Radiology, Rajendra Institute of Medical sciences, Ranchi from April 2019 to October 2020. Manner of presentation and IHBR dilatation, Locoregional lymphadenopathy or infiltration, distant metastases etc were evaluated. Data was entered into excel sheet and analysed using SPSS from IBM.**Results**: Females constituted the majority (56.66%) (n=17). Male: female ratio being .07:1. Three types of presentations of GB carcinoma (wall thickening, mass replacing GB and intraluminal mass) were observed in the study on CT. These cases were histopathologically proven as GB carcinoma.CONCLUSION: Understanding the various GB carcinoma presentations can help optimize Noninvasive staging and treatment planning.

Keywords: USG, GB, MDCT, Malignancy.

Introduction

Background: In computed tomography (CT) a normal GB wall appears as a thin rim of soft tissue density that enhances post contrast injection. A thickened GB wall measures > 3mm and frequently contains a hypodense layer of sub-serosal edema that mimics pericholecystitic fluid. [1]Mostly, the systemic diseases cause diffuse and less marked thickening while the neoplastic diseases result in focal and more exuberant thickening (frequently >10mm). [2] Almost 1-3% of cases of GB carcinoma are recognized incidentally on histopathology once cholecystectomy has been done for some other cause like cholelithiasis, cholecystitis etc. [3,4,5,6]USG has high sensitivity in detecting advanced lesions while less sensitive in detecting early lesions of GB malignancy than CT. [7] CT is used for detection of early malignant lesions and staging purposes. Gall bladder carcinoma can present as mass occupying or replacing GB lumen (40-65%), focal or diffuse asymmetric GB wall thickening (20-30%) or as an intraluminal polypoid lesion (15-25%) on imaging. [8,9]

Aims and objectives: To characterize the various radiological appearances of carcinoma of the Gall bladder on MDCT imaging.

Methodology: After Ethical approval MDCT findings from 30 cases of Cytologically proven cases of carcinoma GB were studied retrospectivelyin the Department of Radiology, Rajendra Institute of Medical sciences, Ranchi from April 2019 to October 2020. Cases were differentiated on the basis of manner of presentation (e.g. mass replacing gall bladder, Intraluminal mass or wall thickening) and associated findings (i.e. IHBR dilatation, locoregional lymphadenopathy, locoregional infiltration, distant metastases) were evaluated. Data was entered into excel sheet and analysed using SPSS from IBM.

Results

Among the thirty cases, females constituted the majority (56.66%) (n=17). Male: female ratio being .07:1. The youngest patient included in the study was 30 years old female and the most elderly patient was a 71-year-old female. Majority of patients (46%) were above 60 years of age.Three types of presentations of GB carcinoma (wall thickening, mass replacing GB and intraluminal mass) were observed in the study on CT. These cases were histopathologically/cytopathologically proven as GB carcinoma. thirteen cases (43.33%) of GB carcinoma presented as mass replacing GB, fourteen cases (46.67%) as wall thickening and the remaining three cases (10%) presented as intra-luminal mass. No cases of GB carcinoma presenting as polyp were observed in the study.

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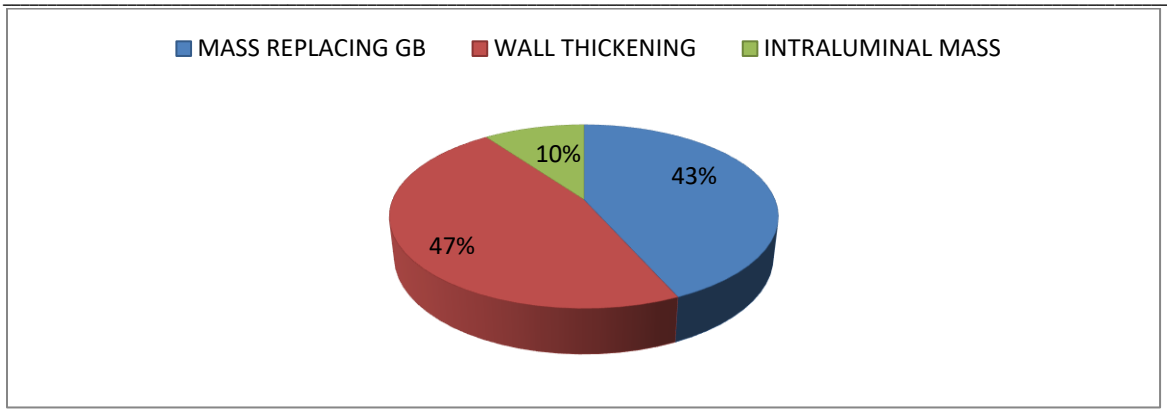

Fig 1:Types of presentation of GB Carcinoma on CT

Patient 1: INTRALUMINAL SOFT TISSUE DENSITY LESION (Red Arrow) ENHANCING ON CONTRAST CT. INTERFACE WITH LIVER PRESERVED.

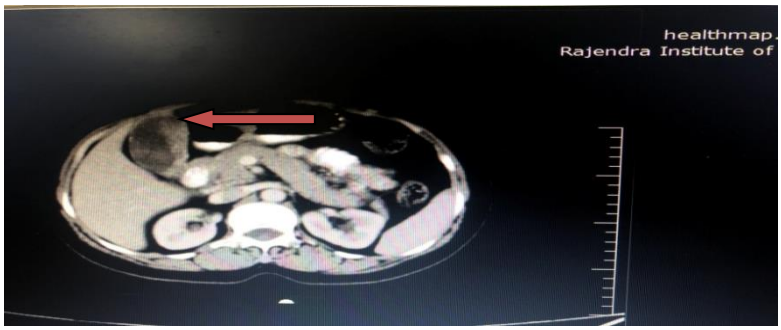

Fig 2:Intraluminal soft tissue density lesion (red arrow) enhancing on contrast CT. interface with liver preserved.

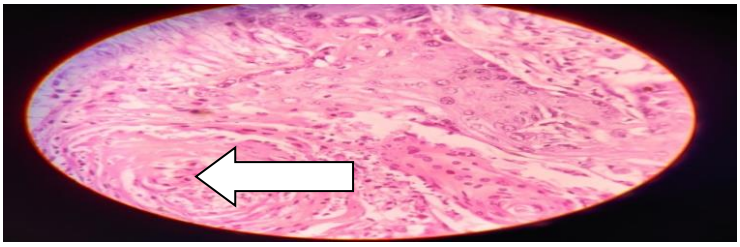

Fig 3:Histopathologically: (arrow) metaplastic squamous epithelium showing atypia with an infiltrating squamous cell carcinoma

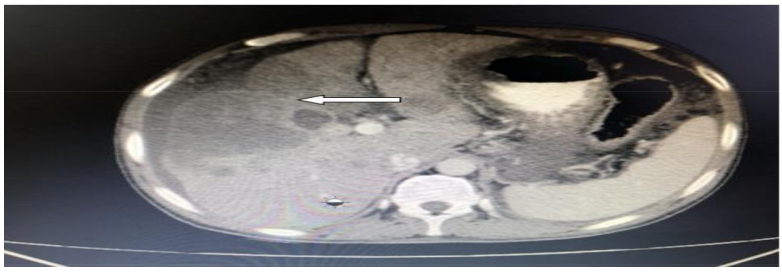

Fig 4: Showing diffuse asymmetric thickening of GB wall (arrow) showing enhancement of wall on contrast study with liver infiltration(Patient 2)

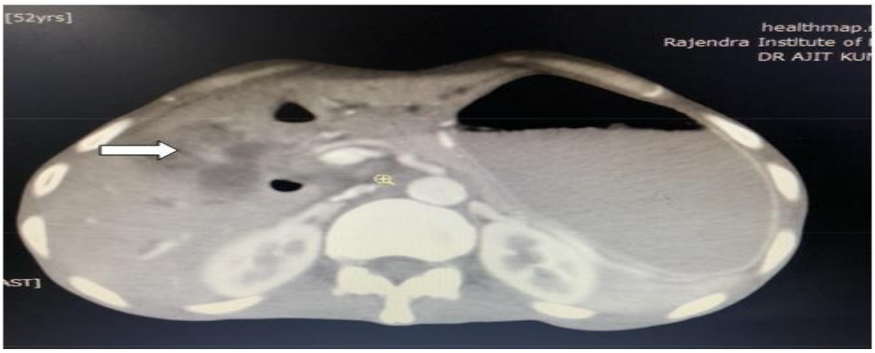

Fig 5:Focal asymmetric thickening of GB wall (arrow) with enhancement on post contrast study with liver infiltration(Patient 3)

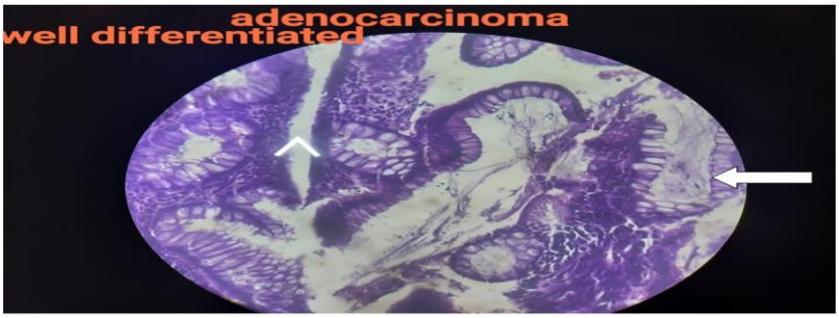

Fig 6:Histopathologically Proven Adenocarcinoma GB. (arrow- Glands with columnar cells)(Patient 2)

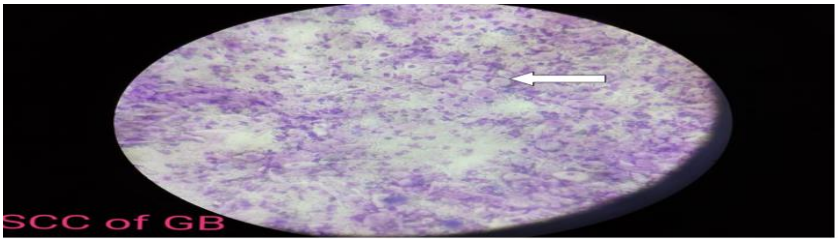

Fig 7: Histopathologically Proven Squamous Cell Carcinoma.(atypical squamous cells showing nuclear abnormality)(Patient 3)

Table 1: Details of the various GB carcinoma presentations

	Mass Replacing GB	Wall thickening	Intra luminal mass	Total
Number of cases	13 (43.33%)	14 (46.66%)	3 (10%)	30
Loco-regional lymph node involvement	10/13 (76.92%)	11/14 (78.57%)	1/3 (33.33%)	22/30 (73.33%)
Retroperitoneal lymph node involvement	4/13 (30.76%)	4/14 (28.57%)	0/3	8/30 (20%)
IHBR dilatation	5/13 (38.46%)	10/14 (71.42%)	0/3	15/30 (50%)
Liver infiltration	11/13 (84.61%)	10/14 (71.42%)	1/3 (33.33%)	22/30 (66.67%)
Distant metastasis	3/13 (23.07%)	3/14 (21.42%)	0/3	6/30 (6.67%)

Discussion

The study done by Rooholamini et al included fifty-nine cases. In this study as well, females constituted the majority (n = 42). Male: female ratio was 2:5. [10]. Singh et al also reported a female preponderance, where thirty patients were females out of forty-six patients. Male: female ratio was 8:15. [11] GB carcinoma has been reported to be higher in females. [12]

The youngest patient included in the study was 30 years old female and the most elderly patient was a 71year old female. Maximum number of patients (46%) was above 60 years of age. In the study done by Rooholamini et al age range varied from 35 to 65 years with a mean range of 65 years. [10] The age range varied from 32-84 years, with maximum patients in the age group of 51-60 years (36.67%). Mean age in this study was found to be 55.73 years. [13] GB carcinoma is mostly seen in elderly patients. [12]contrary to our

study GB carcinoma presenting as mass replacing GB lumen was the most common type of presentation in the study done by Singh et al (2017), where thirty-one out of forty-nine cases (63.26%) presented as mass replacing GB lumen .[11] This presentation was also the most common type of presentation in the study done by Afifi et al (2013), Gore et al (2002) and Haaga et al (2003), Contrary to our study.[3,4,14] Similar to our study, GB carcinoma presenting as wall thickening (focal/ diffuse) was found in 47% of patients in the study done by Rooholamini et al (1994). In the study done by Rooholamini et al (1994) GB carcinoma presenting as wall thickening was found to be the most common presentation on imaging. [10], like our study. In contrast to our finding, wall thickening was found to be the least common presentation in the study done by Afifi et al (2013), Gore et al (2002) and Haaga et al (2003). [3,4,14] Singh et al (2017) also reported wall thickening to be the least common presentation of GB carcinoma. [11] In their study it was reported in only 16.32% of malignant cases. Like our study, intraluminal mass was the least common presentation of GB carcinoma in the study done by Rooholamini et al (1994) and was found in only 17% of cases of GB carcinoma. [10]. Singh et al (2017) reported intraluminal mass in 20.4% of cases. [11] Comparable figures were found in the study done by George et al (2007). [15]Lymphadenopathy was found in 73.33% of cases in our study. This figure was much higher than found in the study done by Singh et al (20.4%) and George et al (42%). [11, 15]IHBR dilatation in our study was found in 50% of our cases and was found comparable to the results of Singh et al where IHBR dilatation was reported in 24.5%. Slightly lower incidence of liver infiltration was found in our study (66.67%), compared to the results of Singh et al, 2017 (75.5%) and George et al, 2007 (72%). [11, 15]

Conclusion

Understanding the various GB carcinoma presentations can help optimize Noninvasive staging and treatment planning.

References

1. Van Breda Vriesman AC, Engelbrecht MR, Smithuis RH, Puylaert JB. Diffuse gallbladder wall thickening: differential diagnosis. *AJR* 2007; 188:495 –501.
2. Soiva M, Aro K, Pamilo M, Paivansalo M, Suramo I, Taavitsainen M. Ultrasonography in carcinoma of the gallbladder. Acta Radiol1987; 28:711-4.
3. Afifi AH, Abougabal AM, Kasem MI. Role of multidetector computed tomography (MDCT) in diagnosis and staging of gall bladder carcinoma. The Egyptian Journal of Radiology and Nuclear Medicine2013; 44:1-7.
4. Gore RM, Yaghmai V, Newmark GM, Berlin JW, Miller FH. Imaging benign and malignant disease of gallbladder. RadiolClin N AM 2002; 40:1307-23.
5. Furlan A, Ferris JV, Hosseinzadeh K, Borhani AA. Gallbladder carcinoma update: Multimodality imaging evaluation, staging and treatment options. AJR 2008; 191:1440-7.
6. Matsusaka S, Yamasaki H, Kitayama Y, et al. Occult gallbladder carcinoma diagnosed by a laparoscopic cholecystectomy. Surg Today 2003; 33:740–2.
7. Lee TY, Ko SF, Huang CC, et al. Intraluminal versus infiltrating gallbladder carcinoma: clinical presentation, ultrasound and computed tomography. World J Gastroenterol. 2009;15(45):5662-5668.
8. Furlan A, Ferris JV, Hosseinzadeh K, Borhani AA. Gallbladder carcinoma update: Multimodality imaging evaluation, staging and treatment options. AJR 2008; 191:1440-7.
9. Vijayakumar A, Vijayakumar A, Patil V, Mallikarjuna MN, Shivaswamy BS. Early diagnosis of gallbladder carcinoma: an algorithm approach. *ISRN Radiol*. 2012;2013:239424.
10. Rooholamini SA, Tehrani NS, Razavi NK, Au AH, et al. Imaging of gall bladder carcinoma. Radiographics1994; 14:291-306.
11. Singh P, Kaur N, Kaur M. Spectrum of CT findings in gall bladder carcinoma patients in north Indian population. Int J Med Res Rev. 2017; 5(05):499-504.
12. Ruiz R, Teyssou H, Fernandez N, Carrez JP, et al. Ultrasonic diagnosis of primary carcinoma of the gall bladder. A review of 16 cases. J Clin Ultrasound 1980; 8:489-95.
13. Jeffrey RB, Laing FC, Wong W, Callen PW. Gangrenous cholecystitis: diagnosis by ultrasound. Radiology 1983:148:219-21.
14. Haaga JR and Herbener EH. The gallbladder and biliary tract. In: Haaga JR, Lanzieri CF, Gilkeson RC (eds.).CT and MR Imaging of the whole body. (4th edn.) St Louis: Mosby; 2003; 1357-60.
15. George RA, Godara SC, Dhagat P. Computed Tomographic Findings in 50 Cases of Gall Bladder Carcinoma. Medical J Armed Forces 2007;63(3):215-9.

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