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Case Report

Diagnostic Imaging of Gallbladder Carcinoma: A Case Report

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Abstract

Gallbladder Carcinoma (GBCA) is rare but lethal due to its poor prognosis. It is the fifth most common gastrointestinal cancer. Patients with GBCA generally have a more advanced stage of the illness when they are first diagnosed with it. The first step in the diagnosis of GBCA is ultrasonography (USG). Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) is performed to better characterize the gallbladder lesions as well as to conduct a metastatic assessment. The use of USG and CT scans has evolved the diagnosis and management of GBCA. MRI is used only in inoperable cases with obstructive jaundice for delineation of the biliary tract anatomy in patients considered for palliative stenting. In this case report, we have presented these imaging findings in a patient with gall bladder carcinoma.

Keywords: Gallbladder Carcinoma; Diagnosis; Gastrointestinal cancer; Imaging findings

Introduction

Despite the fact that the gallbladder is just around an inch (2 cm) in diameter, gallbladder carcinoma (GBCA) is responsible for roughly 165,000 cancer deaths per year, which is 1.7% of all cancer deaths worldwide [1,2]. According to GLOBOCAN 2018 statistics, gallbladder carcinoma is the 22nd most common cancer globally, but it is also the 17th most lethal cancer worldwide [2]. Gallbladder carcinoma is disproportionately deadly because it is seldom detected until it has metastasized to the adjacent organs [3].

The first step in the diagnosis of GBCA is ultrasonography (USG). Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) is performed to better characterize the gallbladder lesions as well as to conduct a metastatic assessment. The use of USG and CT scans has evolved the diagnosis and management of GBCA [4]. There may be some benefit to using USG in detecting gadolinium-based contrast agents, however, the infiltrative nature of certain tumors and the presence of gallstones, inflammation, or debris may make tumor identification difficult or impossible. In the case of GBCA imaging and staging, CT has been shown to be a comprehensive technique. Ultrasound obscures parts of the gallbladder wall; hence CT is the preferred imaging modality for determining gallbladder wall thickness. It is difficult to diagnose gallbladder wall thickening as it resembles the more common inflammatory conditions of the gallbladder [5]. CT, MRI with magnetic resonance cholangiography (MRC) and/or traditional cholangiography often provide additional information including specific staging [4]. Endoscopic ultrasound, Fine needle aspiration are also very much useful in the diagnosis and management of GBCA [6].

In this case report, we have presented these imaging findings in a patient with gall bladder carcinoma.

Case report

An 80 years old woman, was admitted on 25th Jan 2020, under the surgery unit of Holy Family Red Crescent Hospital with complaints of pain in the right upper and lower abdomen for 2 days and also vomiting for 2 days. She was Nondiabetic, Normotensive, Non-asthmatic. According to her past history, she was reasonably well 8 months back. Then suddenly she developed fever and pain in the upper abdomen, which is radiated to the chest and back. The pain was intermittent and was associated with vomiting.

Findings

- The blood sample demonstrated increased WBC (407x1.9/L) and ESR (73mm in 1st hr). Total Bilirubin was raised (3.6 mg/dl).
- Serum Alkaline phosphatase and ALT (SGPT) level was also raised which were 635 IU/L and 71 IU/L respectively.
- The Carbohydrate Antigen CA19-9 level was within the normal limit (27.45 U/ml).
- Abdominal ultrasound revealed contracted GB with soft tissue mass within its lumen, soft tissue mass in porta hepatis with focal compression and invasion, intrahepatic biliary dilatation with suspected mass is CBD and dilated MPD.

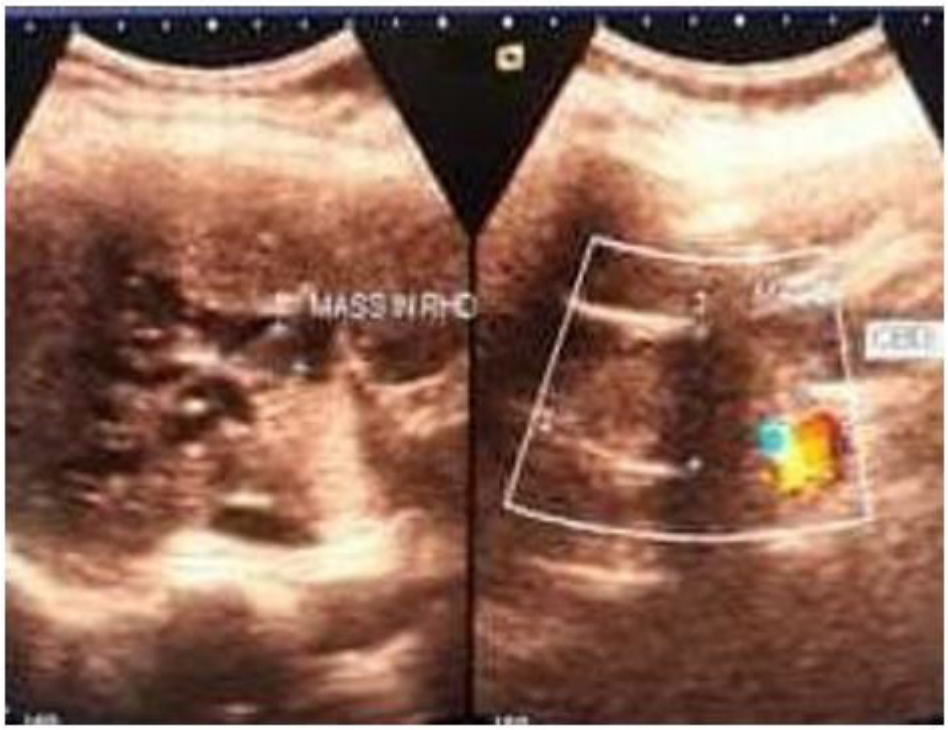

Figure 1: Ultrasound image reveals contractedGB with soft tissue mass within its lumen,soft tissue mass in porta hepatis with focal compression and invasion, intrahepatic biliary dilatation with suspected mass is CBD, and dilated MPD

These findings were further investigated by CT. Multiaxial pre- and post-contrast CT scan suggested Neoplasm in GB and CBD with an invasion of CHD with dilatation of intra- hepatic biliary tree and also Ampulla of Vater and adjoining head of pancreas and duodenum with dilatation of MPD. There was also minimal right-sided pleural effusion. Later a CT-guided FNAC was done and Adenocarcinoma was diagnosed.

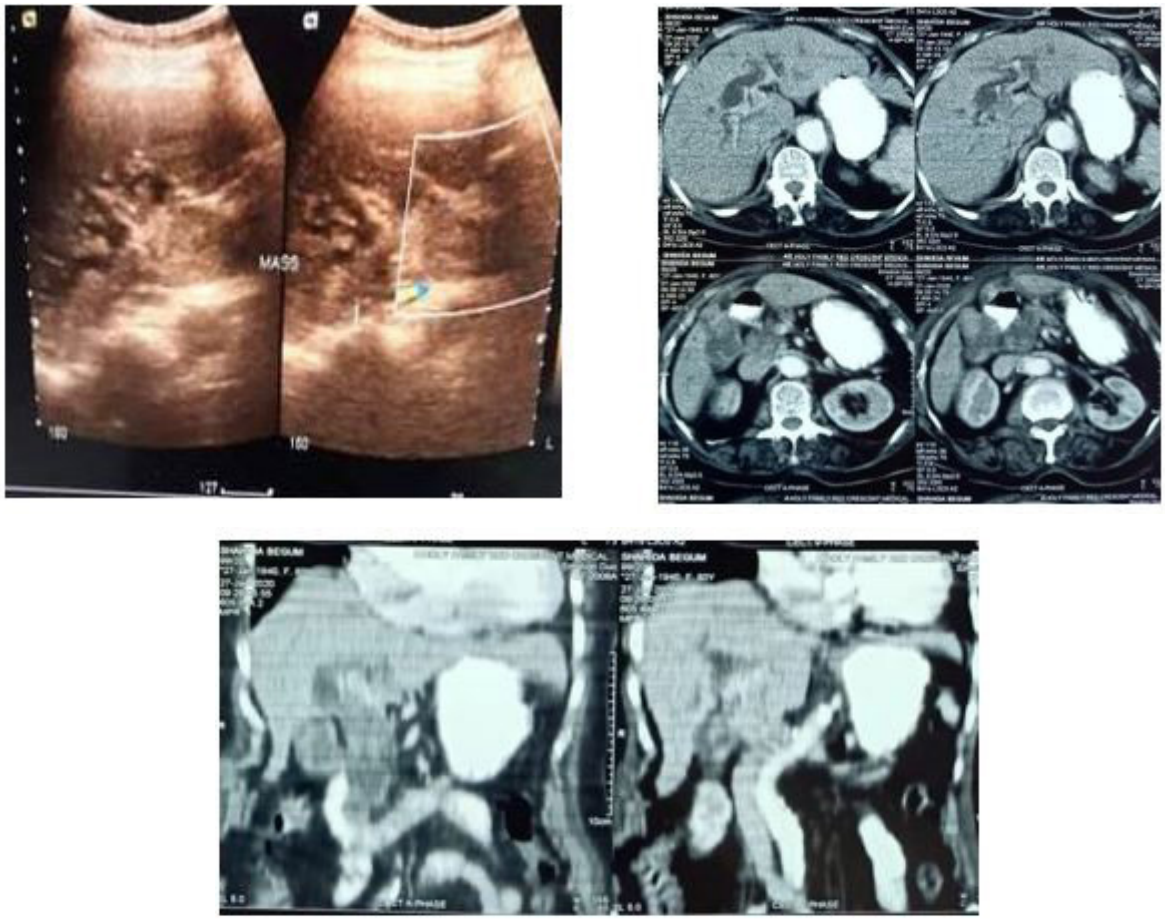

Figure 2: Multiaxial pre- and post-contrast CT scan suggested Neoplasm in GB and CBD with theinvasion of CHD with dilatation of intra-hepatic biliary tree and also Ampulla of Vater and adjoining head of pancreas andduodenum with dilatation of MPD. Therewas also minimal right-sided pleural effusion

Discussion

GBCA is rare but is an extremely deadly carcinoma [7]. Early local invasion is facilitated by anatomical factors, and this tumor's ease of invasion into the liver and biliary system contributes to its high fatality rate [8]. Furthermore, it shows a proclivity for lymphatic invasion, hematogenous dissemination, and peritoneal surface implantability. It's also difficult to identify early since the symptoms and indications are similar to those of other benign conditions like cholelithiasis or chronic cholecystitis, which might be misdiagnosed as cancer [9]. The majority of the studies reported poor prognosis with a 5-year survival rate [8].

The majority of cases of GBCA are identified inadvertently during surgical exploration for benign gallbladder condition [10]. Over 90% of GBCAs have been identified to be adenocarcinomas and have an epithelial origin. On the basis of the degree of gland development, adenocarcinomas may be further classified as well-differentiated, moderately differentiated, or poorly differentiated [8]. The other subtypes include adenosquamous or squamous cell carcinoma, small cell neuroendocrine tumors, sarcoma, and lymphomas [10].

There are no identifiable signs or symptoms for GBCA, therefore diagnosing the condition is difficult. As a result, identification usually occurs late in the course of the disease or as an unexpected discovery after cholecystectomy for biliary obstruction or other medical reasons. Most patients have discomfort in the right upper quadrant of the abdomen when they first come in. Anorexia, weight loss, nausea, and vomiting are also commonly associated. Raised levels of the cancer embryonic antigen (CEA) in the blood may help with diagnosis [7].

Ultrasonography (USG) is often used as the primary imaging tool in the investigation of gallbladder illness because of its cheap cost and accessibility [9]. Discontinuous thickening of the gallbladder mucosa, diffuse thickening of the gallbladder wall (>12mm), mural calcification, mass projecting into the lumen, a fixed mass in the gallbladder, and loss of the liver-gallbladder interface are all indications typically linked with gallbladder cancer. When used for extra-hepatic CCA diagnosis, USG has a sensitivity of 89% and a specificity of 80% to 95% [11,12]. In this case, the abdominal ultrasound revealed contracted GB with soft tissue mass within its lumen, soft tissue mass in porta hepatis with focal compression and invasion, intrahepatic biliary dilatation with suspected mass is CBD, and dilated MPD which indicates the late stage of tumor (Figure 1). However, Ultrasonography may identify late-stage tumors with great sensitivity in the case of GBCA, but its value is restricted in the early diagnosis and staging of lesions [13]. Endoscopic ultrasonography (EUS) has grown in favor of evaluating GBCA in recent years since it overcomes this constraint. Using this method, the extent of tumor invasion into the gallbladder wall and the presence of lymphadenopathy in the porta hepatis and peripancreatic areas may be determined [12].

In order to determine the thickness of the gallbladder wall in areas that are not visible on ultrasonography, Computed Tomography (CT) is used. The diagnosis of gallbladder wall thickening remains difficult due to the fact that it resembles the look of more frequent inflammatory conditions of the gallbladder. Malignancy should be suspected in cases of considerable wall thickening (>1.0 cm) with accompanied mural irregularity or severe asymmetry [8]. A non-neoplastic process is more likely to be the cause of diffuse symmetrical wall thickening. On unenhanced CT, GBCA is often hypodense, with up to 40% of cases demonstrating hypervascular foci of enhancement equal to or higher than that of the neighboring hepatic parenchyma (Correlative Imaging in Gallbladder Carcinoma). A significant prevalence of lymphatic spread has been seen, with lymphatic spread spreading from the gallbladder fossa, via the hepatoduodenal ligament, to nodal points around the pancreatic head [8].

It is possible that masses surrounding the common bile duct and the head of the pancreas be mistaken for pancreatic head cancer. Contrast-Enhanced CT (CECT) has been shown to be up to 90% sensitive and especially successful in identifying T2 or greater tumors [14]. In this case, multi-axial pre- and post-contrast CT scan suggested Neoplasm in GB and CBD with an invasion of CHD with dilatation of intra-hepatic biliary tree and also Ampulla of Vater and adjoining head of pancreas and duodenum with dilatation of MPD (Figure 2).

Conclusion

Carcinomas of the gallbladder are rare, but when they do occur, the prognosis is poor because of the late detection. When it comes to early-stage tumor diagnosis and pre-operative planning, USG, CT, CECT, MRI, and EUS are crucial. Radiology plays a significant role in the treatment of various cancers and must be used in conjunction with other diagnostic modalities, clinical characteristics, and the histological grade of cancer to provide a comprehensive picture.

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