

Mass Forming Intrahepatic Cholangiocarcinoma- An Imaging Mimicker Of Hepato-Cellular Carcinoma And Abscess

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Abstract:

Cholangiocarcinoma (CCA) is the second most common primary malignancy of liver. Intrahepatic mass-forming (IMCC) is one of the three patterns of cholangio carcinoma. On imaging IMCC usually presents as irregularly outlined homogenous mass with low attenuation and minimal peripheral enhancement, mild intrahepatic biliary dilatation (IHBD). Sometimes, biliary dilatation, capsular retraction and satellite nodules are other features helping in diagnosis of IMCC. Out of 56 cases we evaluated for liver neoplasms on MDCT, the most common lesions encountered are Hepatocellular carcinoma (n=47, 83.9%) followed by Cholangiocarcinoma. All the 5 cases of IMCC are larger tumors with homogeneously hypodense on NECT. On contrast there was rim enhancement in most of these cases. One case had delayed wash out mimicking HCC. Capsular retraction indicated the diagnosis of IMCC. The 5TH case was confused with abscess but absence of double rim sign indicated alternate diagnosis. Hence absence of double rim and washout in delayed images differentiate IMCC from liver abscess and HCC.

Keywords: cholangiocarcinoma, Hepato-cellular carcinoma, hepatic abscess

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I. Introduction:

Cholangiocarcinoma (CCA) is the second most common primary malignancy of liver. It accounts or 10-20% of the primaries in Liver [1]. Three different pathological patterns observed are mass-forming (IMCC), periductal infiltrating and intra ductal growth. Each of these has distinct imaging features and they have many differential diagnoses on imaging. Accurate diagnosis is challenging and is a necessity, as treatment options are varied. In most cases, only histopathological findings clinch the final diagnosis.

Intrahepatic mass forming cholangiocarcinoma (IMCC) appears as homogenous sclerosed mass with irregular lobulated contour without presence of haemorrhage or necrosis on gross examination. Central portion of tumor consists of variable degree of fibrosis and show coagulable necrosis with few scattered tumor cells. On imaging ICC usually presents as irregularly outlined homogenous mass with low attenuation and minimal peripheral enhancement, mild intrahepatic biliary dilatation (IHBD) and vascular encasement without formation of tumour thrombosis. Sometimes biliary dilatation, capsular retraction and satellite nodules are other features helping in diagnosis of IMCC. In this situation hepatic abscess is a close differential on imaging though clinically ICC have elevation of bilirubin, alkaline phosphatase, CA-10 -9, elevated CEA. Sometimes HCC may also be confused with ICC. Here we are presenting our cases with emphasis on points of differentiation of intrahepatic mass forming cholangiocarcinoma from HCC and liver abscess on imaging alone.

II. Material & Methods

We have done a prospective study of 56 patients with suspected lump in liver and confirmed on USG were selected over 18 months from march 2021 to September 2022 in NIMS Hyderabad. MDCT triple phase was done in all patients. Out of them, 42 were males and 14 females. Imaging findings, clinical features, biochemical parameters were analysed and radiological diagnosis was made. Imaging diagnosis was compared and confirmed with HPE findings. Out of 56 cases evaluated for liver neoplasms on MDCT, the most common lesions encountered are Hepatocellular carcinoma (n=47, 83.9%) followed by Cholangiocarcinoma (n=5, 8.9%). Two cases of Hepatic adenoma, one case each of Focal Nodular Hyperplasia, and Hepatoblastoma are included in the study.

Case Details:

Patient 1 (Figure- 1):

42F intermittent pain abdomen, jaundice, weight loss AFP-10IU, CA19-9- 8589 increased. On MDCT there is a large (>5cm) homogenously hypodense sol in segment 5, 7 of liver NECT and showing peripheral rim enhancement in arterial and portal venous phase. There is subtle capsular retraction and mild IHBD in left lobe of liver which differentiates it from liver abscess on imaging.

Patient 2 (Figure-2):

51/M pain abdomen, weight loss since 6months and known alcoholic, HBS AG positive, and CA19-9-120.7 was elevated. On MDCT the SOL appear homogenously hypodense with lobulated contour and minimal peripheral enhancement in segment 7 of liver. Mass was more than 3cm. There is no capsular retraction, no IHBD, no satellite nodule. There is a pulmonary metastasis in left base. The differentials being hepatic abscess and HCC. Absence of double rim sign differentiate from liver abscess and faint rim enhancement is uncommon in HCC. Intra lesional fat, delayed capsular enhancement and tumor thrombus are common in HCC and capsular retraction is uncommon.

Patient 3 (Figure- 3):

47 M, known alcoholic presented with jaundice. On MDCT the SOL appear homogenously hypodense with lobulated contour and arterial phase peripheral enhancement in segment 7 of liver which is washed out in delayed images. Capsular retraction adjacent to mass and enlarged node in aortocaval region. Capsular retraction is the clue to differentiate from its mimics HCC.

Patient 4 (Figure- 4)

56/M presented with acute abdomen and on investigation proven to be cholangiocarcinoma. There was hypodense peripherally enhancing mass in segment 4 of liver. Size was 4cmms and there were two satellite lesions seen adjacent to the mass and there is peripheral IHBD. Enhancement pattern and IHBD differentiated from HCC.

Patient 5 (Figure- 5):

50M presented with pain abdomen, weight loss and increased CA 19-9. There is large lobulated peripherally enhancing sol in segment 5 of liver. There are pockets of air within and in biliary tree. It was diagnosed as liver abscess with rupture, but biopsy turned out to be cholangiocarcinoma. There are subcapsular collections. Usually, biliary enteric fistula present air in biliary tree and the most common cause is infective etiology. Retrospective analysis revealed the peripheral enhancement with mild IHBD, no double rim sign that indicated ICC.

III. Discussion:

IMCC is second most common primary hepatic mass accounting for 10-20% of liver cancer [1]. We had similar experience. Out of 56 ,5 cases turned out to be mass forming cholangio carcinoma that is approximately 9%. Typical imaging features of mass forming intrahepatic cholangiocarcinoma are irregularly outlined homogenous mass with low attenuation and minimal peripheral enhancement. Capsular retraction, bile duct dilatation, hepatolithiasis, lymphadenopathy if present the diagnosis is easier. Absence of necrosis and haemorrhage seen pathologically in intrahepatic cholangiocarcinoma. Tumour cells are located at periphery and central portion has variable fibrosis which show delayed enhancement in 3-15minutes depending on interstitial space in fibrosis. Hence no wash out in in delayed phases. Areas of early enhancement and rapid wash out indicated active growth. ICC in cirrhosis have poor prognosis. Sometimes Hemangioma is a differential. Contiguous ragged rim enhancement is seen in ICC. Stronger, globular peripheral enhancement is seen in Hemangioma. Vascular encasement is common but thrombosis is uncommon.

According to Lavarone et al the imaging appearance of cholangiocarcinoma depends on size of tumor whether >3cm or not [2]. Most of the IMCC present with large mass as they are mostly asymptomatic as compared to HCC. In another study, Ciresa M et al have compared HCC enhancement pattern with IMCC in cirrhotic patient. IMCC appear hypodense compared to adjacent liver parenchyma on plain scan and showed 4 different pattern of enhancement. 30% showed rim like, 55% progressive, 5% stable enhancement and 10% showed wash out mimicking HCC. HCC were hypodense in 83% and rest were isodense. 83% showed wash out enhancement ,5.6% progressive ,11% stable enhancement (they defined nodular enhancement as progressively increased with maximum enhancement in equilibrium phase, rim like enhancement where it is limited to periphery remain intensive from arterial to portal and delayed phase, stable enhancement is unmodified throughout the whole process but not restricted to only periphery, wash out is intense enhancement in arterial and portal phase followed by wash out in equilibrium phase) [1]. Stable enhancement is seen in smaller IMCC <3cms [3].

All our 5 cases were more than 3 cms in size, hypodense on NECT and showing peripheral rim enhancement in 4. One of the cases had wash out in delayed scan. This case was mimicking HCC and capsular retraction gave the clue to diagnosis. Arterial phase enhancement and wash out in delayed and portal phase is also recently described [4]. Presence of air in hypodense peripheral enhancing mass was confused with abscess. Mild IHBD is clue to diagnosis of the IMCC. There was no delayed enhancing capsule in any of our cases; capsular retraction was observed in 2, IHBD in 3, satellite lesions in 2 which favours ICC.

Differentials include abscess and HCC. Abscesses have double rim sign. Central low attenuation surrounded by high attenuation inner rim and low attenuation outer rim .Inner rim demonstrates early enhancement which persists in delayed scan .The outer hypodense rim is oedematous adjacent liver parenchyma showing enhancement in delayed images. Capsular retractions, biliary dilation, absence of vascular thrombosis differentiate it from HCC. Delayed capsular enhancement and presence of intralesional fat indicates HCC.

Main issue in cholangiocarcinoma after diagnosis is whether tumor is resectable or not . The criteria of resectability are absence of lymph node or liver metastases, absence of involvement of portal vein, absence of direct invasion of adjacent organ, absence of widespread metastatic disease [5].

IV. Conclusions:

IMCC typically appears as a large homogenously hypodense on NECT and show peripheral rim enhancement. If IHBD, capsular retraction or involvement of vessels without thrombosis presents it favours ICC as in our cases. Absent of contrast washout and double rim sign excludes hepatic abscess and HCC.

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Legends

Figure- 1: 42/f: ICC showing peripheral enhancement and retraction of capsule

Figure- 2: 51/m: ICC has faint rim enhancement and there is pulmonary metastasis

Figure-3: 47/m: Mass showing peripheral enhancement, capsular retraction , enlarged nodes in aortocaval region

Figure-4: Satellite lesion and intrahepatic biliary dilatation suggest the mass to be cholangiocarcinoma in a patient 56/m

Figure- 5: Presence of air within the peripherally enhancing mass in a 50/m suggest fistulous communication of the tumor

Figure-1:

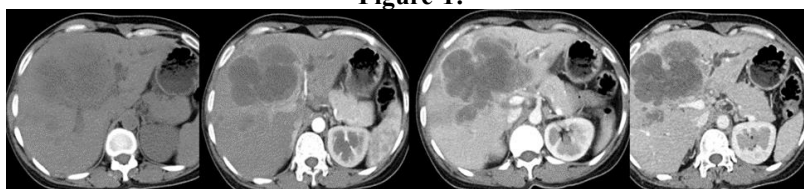


Figure-2:



Figure-3:

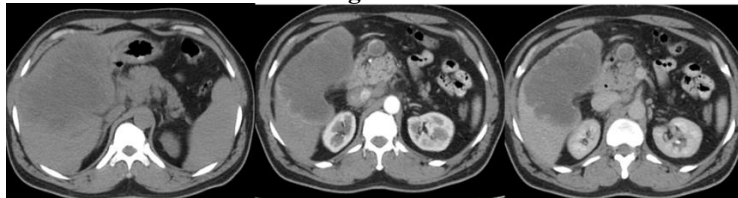


Figure-4:

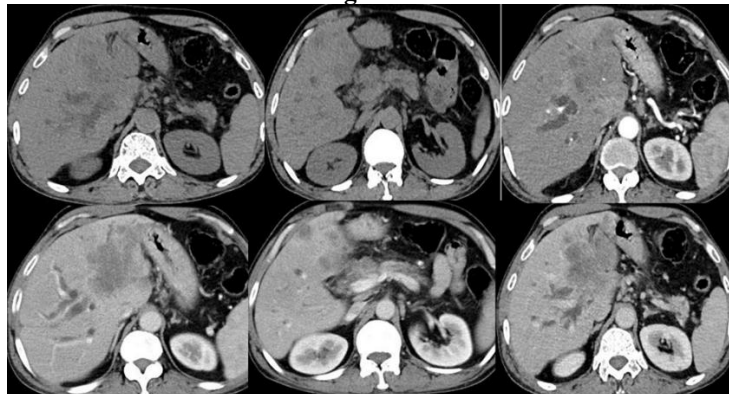


Figure-5:

