



Incidence of Periapillary Carcinoma as the Commonest Cause of Terminal CBD Obstruction - A Study Based on Computed Tomography Findings

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Abstract

Introduction: Biliary obstruction can occur anywhere in the tract carrying bile from liver to gall bladder and duodenum. Terminal CBD is the distal most part which is a common site for biliary obstruction. This study aims at finding various causes of terminal CBD obstruction and its characteristics using computed tomography imaging

Materials And Methods: Cross sectional study done at department of radiodiagnosis for a period of 2 years among 25 patients with clinically suspected obstructive jaundice and underwent contrast enhanced CT, diagnosed to have obstruction at terminal CBD level. CT diagnosis was correlated with ERCP or histopathology as applicable.

Results: Most common cause for terminal CBD obstruction was found to be periampullary malignancy (60%). Among them majority of cases were adenocarcinoma duodenum (53%). CT was (87%) accurate in detecting adenocarcinoma duodenum as the major cause of periampullary mass lesion.

Conclusion: Periapillary carcinoma is the common cause for terminal CBD obstruction

Keywords: periampullary mass lesion, adenocarcinoma duodenum, computed tomography.

Introduction

Biliary obstruction is a common cause of jaundice among which obstruction can occur at any levels in the biliary tree like right and left biliary ducts, common hepatic duct, or anywhere in common bile duct. Distal or terminal CBD is the portion near the ampulla of Vater where CBD joins with pancreatic duct and enters ampulla¹.

The causes of biliary obstruction at terminal CBD includes both benign and malignant. benign

causes are choledocholithiasis, infective strictures etc and malignant causes include periampullary carcinoma which may be due to duodenal adenocarcinoma, cholangiocarcinoma, pancreatic head neoplasms and rarely metastasis and lymphoma².

Multi detector computed tomography with contrast study and multiplanar reconstructions are excellent in identifying the causes of terminal CBD obstruction³. Presence of calcific density,

with absent contrast enhancement and purely intraluminal location with no wall irregularity indicates calculus as the cause of obstruction. Benign and malignant strictures can be differentiated by presence of narrowing with upstream dilatation, depending on the all thickness, location, length of stricture, enhancement pattern, lymphnode status and distant metastasis⁴.

Different types of periampullary carcinomas are identified by contrast enhanced MDCT with multiplanar reconstruction by determining whether mass forming, infiltrating or polypoidal growth to intraduodenal part, enhancement pattern in different phases, infiltration to surrounding areas.

This study aims to evaluate the causes of terminal CBD obstruction using MDCT as the imaging modality and correlating the findings with histopathology or surgery as applicable

Materials and Methods

Cross sectional study was done at department of radiodiagnosis, MES medical college perinthalmanna for a period of 2 years in 25 patients with clinically suspected obstructive jaundice and who underwent contrast enhanced CT imaging with multi planar reconstruction and found to have cause of obstruction at terminal CBD level.

Patients not giving consent for follow up of the disease, those having contraindications for iodinated IV contrast like previous episodes of contrast hypersensitivity and altered renal parameters and those having level of biliary obstruction other than terminal CBD were excluded from the study

Patients were kept nil orally 4 hrs prior to the CT scan to avoid vomiting and aspiration while administering contrast medium. Risks of contrast administration were explained to the patient and consent was obtained prior to the contrast study.

Routine anteroposterior to pogram of the abdomen was initially taken in all patients in the supine position with the breath held. Axial sections of 5

mm thickness was taken from the level of lung bases to the level ischial tuberosities using Philips access 16 slice CT scanner. Prior administration of plain (neutral) water as done in all cases. plain scan was followed by intravenous contrast scan in suspended inspiration. Contrast as given in a dose of 300mg of Iodine / Kg body weight and axial sections were taken. Sections were taken in arterial (30 sec) in the liver area and portal venous (60 – 90 sec) phases covering till pelvic region. Post study reconstructions were done at 2.5 mm. Sagittal and coronal reconstructions were made wherever necessary. Newer techniques in multislice CT like curved planar reformatting, volume rendering, Maximum and minimum intensity projections and inversion were done as and when necessary. The magnification mode was commonly employed, and the scans were reviewed on a direct display console at multiple window settings (i.e. abdomen window at 320/40; Lung window 1400/-600; Bone window of 2400/200)

Patients with level of biliary obstruction at terminal CBD level were selected and the cause for obstruction in the form of calculus, stricture or mass ,pre and post ontrast attenuation values, presence of calcification, necrosis, mass effect, infiltration, lymph nodal enlargement, character of the stricture and upstream dilatation .

CT diagnosis was correlated with ERCP or histopathology findings as applicable.

Data of each patient was kept in Microsoft excel sheet. CT images of all the patients ere recorded and maintained. Analysis was done with SPSS (Statistical Package for Social Sciences) to find out sensitivity, specificity, positive predictive value, negative predictive value and accuracy.

Results

Among 25 cases studied majority were female (72%) than males (28%) with most of them under the age group 60-90 (60%).minimum age studied was 20 and maximum age 91.

Among total cases periampullary malignancy was 60% when compared to other benign causes 40%.

Among total 10 benign cases choledocholithiasis was the common cause of terminal CBD obstruction 60% compared to other benign cause – inflammatory stricture 40%.

Among 15 malignant cases 8 cases had predominant intra luminal compression of CBD with mass protruding to duodenal lumen (53%), 4 cases had predominant mass lesion in head of pancreas region causing extrinsic compression of CBD, 1 case was having infiltrating lesion along wall of CBD, 1 case had lymphnodal mass around head of pancreas causing extrinsic CBD compression, 1 of them had a known malignancy with metastasis including peri ampullary region. Significant enhancement was noted in 40% of cases, peripheral enhancement with central necrotic area in 16%, delayed enhancement in 4% and no enhancement in 40% of cases

Significant enhancing peripheral lymphnodes was noted in 48% of cases, distant metastasis in 20% of cases.

Among 5 cases with CBD stricture, long segment, thick walled, irregular enhancing stricture was noted in 1 case (20%) were as 4 cases (80%) had regular short segment thin non enhancing stricture

Overall MDCT had 100% sensitivity, specificity and accuracy in differentiation of benign and malignant lesions

MDCT correctly diagnosed type of malignancy in 87% of cases in correlation with histopathology



Fig 1: significantly enhancing lesion in terminal CBD causing biliary obstruction – ampullary adeno carcinoma



Fig 2: Significantly enhancing polypoidal lesion in distal CBD protruding into duodenal lumen – ampullary adenocarcinoma

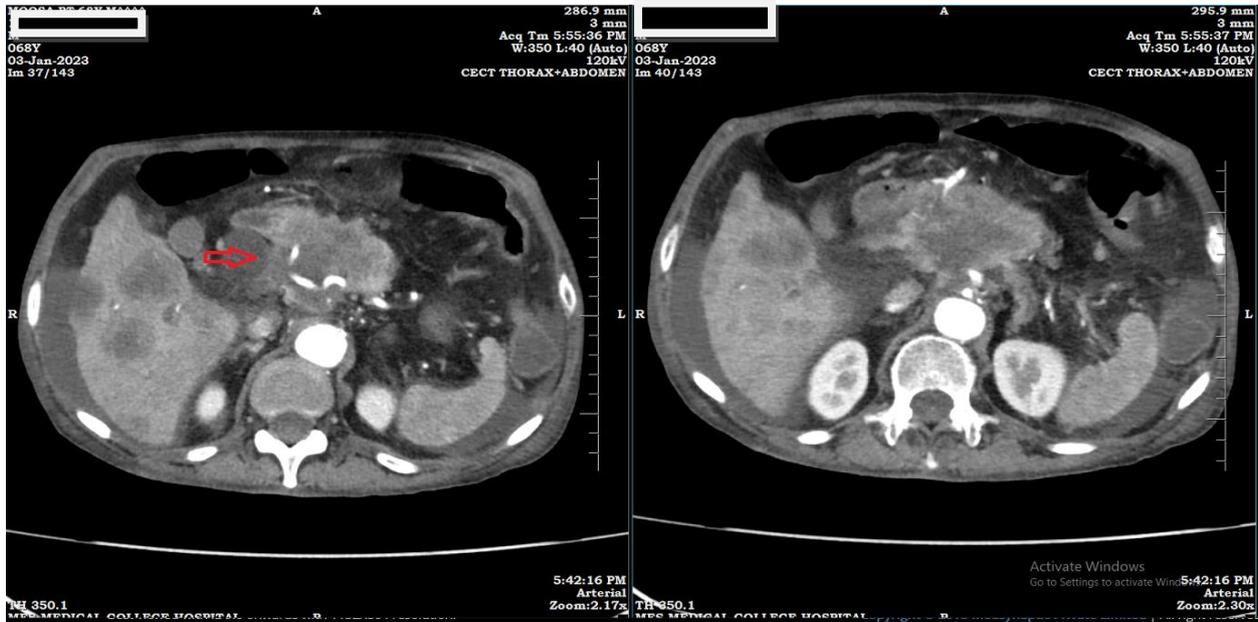


Fig 3: dilatation of CBD due to peripherally enhancing lesion in pancreatic head with central necrosis and hepatic mets – pancreatic adeno carcinoma

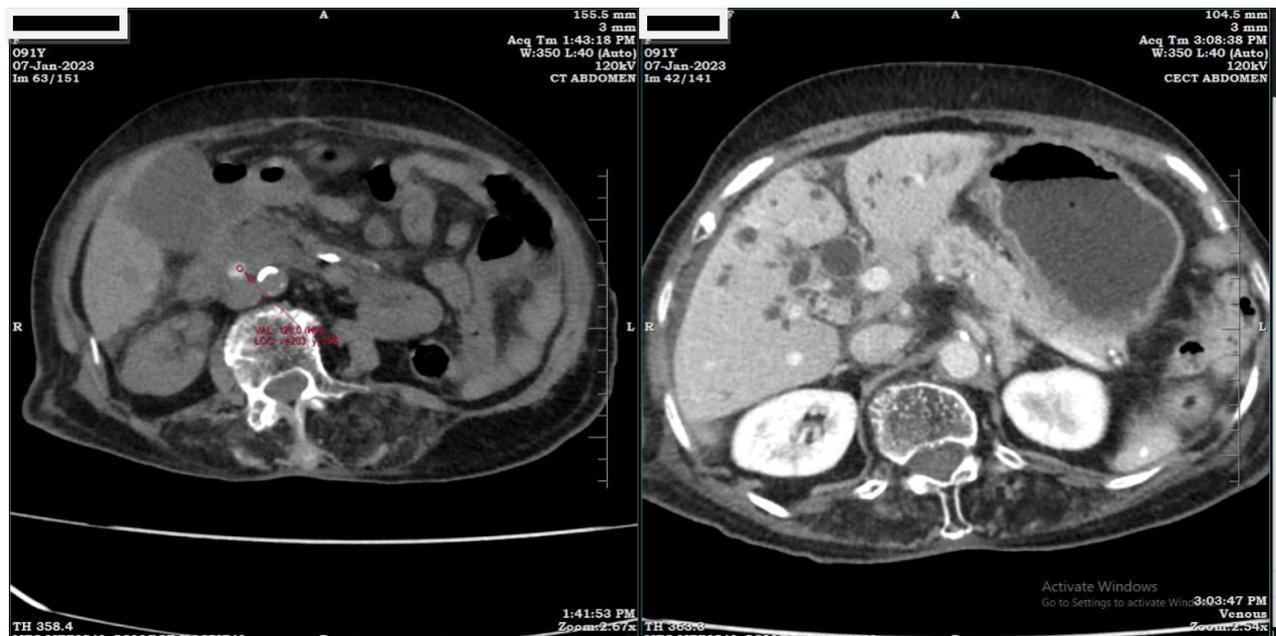


Fig 4: Hyperdense calculus noted in distal CBD causing CBD obstruction and IHBRD

Discussion

In our study predominant age group was older age with female predominance.

Among the causes of terminal CBD obstruction malignancy (60%) was more common than benign (40%) causes.

Among benign causes choledocholithiasis was the commonest one (60%). This was similar to study done by Suthar M et al⁶, who also got choledocholithiasis as the major benign cause of CBD obstruction.

Among malignant causes majority of cases had intraluminal mass causing obstruction .Intraluminal polypoidal mass protruding towards duodenal lumen was reported as duodenal lesion which had histopathological correlation as duodenal adeno carcinoma. A study done by Nikolaidis et al⁷ on imaging features of ampullary and peri ampullary lesions also described duodenal adeno carcinoma as polypoidal intraluminal lesions involving terminal CBD.

Significant post contrast enhancement was noted in majority of malignant lesions. as majority of these cases were ampullary adenocarcinoma they show enhancement compared to other lesions like pancreatic neoplasm which is hypo enhancing and show necrosis and cholangiocarcinoma which was infiltrating type of lesion with delayed enhancement⁷.

Among 40% benign cases none of them showed enhancement.

Peripheral lymphnodal enlargement with enhancement was noted in 48% of cases which included malignant causes of obstruction and distant metastasis in 20% of cases that also in malignant etiology. among this pancreatic lesions and a case of lymphoma was contributing to majority of cases.

Among cases with strictures, long segment, irregular, enhancing, thick walled strictures were noted in 20% of cases which was found to be a malignant cause. Benign causes like inflammatory strictures were noted in short thin non enhancing regular bordered strictures⁴.

Overall MDCT with good reformatting techniques had high accuracy in differentiation of benign and malignant causes if terminal CBD obstruction with correctly diagnosed 87% causes of obstruction on histopathology correlation. This was similar to study done by Mathew RP et al⁸ who got 98% accuracy in detecting cause of biliary obstruction using MDCT with reformatting techniques.

Conclusion

Most common cause of terminal CBD obstruction was malignancy in which duodenal lesions predominated and MDCT with good reformatting techniques was highly accurate in evaluation of terminal CBD obstruction

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