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CT Assesment of Acute Pancreatitis and Its Impediment

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ABSTRACT.
This study is performed within the Department of Surgery, Tripura Medical College & Dr. BRAM Teaching Hospital. The examination has been performed on 30 patients. Of 30 patients recognized with acute pancreatitis who underwent contrast- stronger MDCT inside three days of the onset of signs. The correlation among the severity of pancreatitis affected person for the changed CT severity indexes becomes impediment.

I. INTRODUCTION

Acute pancreatitis is one of the most complex and clinically hard conditions of all belly disorders. Early assessment of the purpose and severity of acute pancreatitis is of excessive importance for activate treatment and close monitoring of affected man or woman with a immoderate disease. Imaging plays an important function withinside the manipulate of the affected man or woman with acute pancreatitis. CT, in particular, has revolutionized pancreatic imaging, and what became as quickly as considered a hidden organ also can moreover now be effectively and noninvasively imaged.

II. LITERATURE REVIEW

2.1 Normal Anatomy of Pancreato- Biliary System in MRCP

Bile plays an important role in intestinal absorption. It is secreted by the liver and is transported into the duodenum through the biliary system. There is significant variation seen in the biliary tree, with normal biliary anatomy seen only in 50–60 % of the population. Hence, the basic knowledge of its normal anatomy and its variant is important to differentiate from the pathology. Biliary system consists of intrahepatic and extrahepatic components. The intrahepatic component is formed by various biliary radicles draining the respective hepatic segments. Biliary radicles draining segments V, VIII form right anterior bile duct which is oriented vertically, and biliary radicles draining segment VI, VII form right posterior bile duct which is oriented horizontally. These right anterior and posterior bile ducts combine to form right hepatic duct (RHD). Biliary radicles draining segments II, III, and IV form left hepatic duct (LHD). The LHD and RHD combine together to form the common hepatic duct (CHD). Segment I is drained by separate biliary radicles draining in the angle of RHD & LHD. The extra-hepatic biliary system consists of CHD & common bile duct (CBD). CHD and cystic duct combine together to form the CBD. Both CBD and common hepatic artery are seen anterior to the portal vein, with CBD on the right and hepatic artery on the left. CBD normally measures 5 mm up to 50 years of age and shows an increment of 1 mm per decade. Pancreas is drained by PD which is embryologically derived from the fusion of the ventral duct of Wirsung (major PD) and the dorsal duct of Santorini (minor PD). Non-fusion of these ducts forms most common variant called pancreatic divisum seen in up to 14 % of population.

2.2 Gall Bladder Carcinoma

Gall bladder cancer most often occurs in elderly women and is usually associated with gallstones (90 % of cases). Other risk factors include a chronic typhoid carrier state, choledochal cyst, gall bladder polyp, anomalous APBJ, and porcelain gallbladder. About 20 % of patients with porcelain gallbladder develop gallbladder cancer. Gall bladder carcinomas are characterized by local invasion, extensive regional lymph node metastasis, vascular encasement, and distant metastases. In general, it is the most aggressive of the biliary cancers with the shortest median survival duration and requires early surgical intervention. Hence early diagnosis is crucial for patient management.

Obstructive jaundice can occur either due to invasion of gall bladder mass in the region of porta (Figs. 9, 10) or due to metastatic portal lymphadenopathy compressing the bile duct. Morphologically, gallbladder carcinoma can present as a mass completely occupying or replacing the gallbladder lumen, focal, or diffuse asymmetric gallbladder wall thickening or as an intraluminal polypoidal lesion[35]. Mass forming type is the most common, causing obstructive jaundice due to hilar extension.[36]

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Fig. 1. MDCT in axial, coronal, and sagittal planes depicts a heterogeneously enhancing mass lesion replacing gall bladder in the region of gall bladder fossa (arrow) with localized invasion in the adjacent liver and porta causing intra-hepatic biliary dilatation (arrowhead). Metallic biliary stent noted in situ (thin arrow)

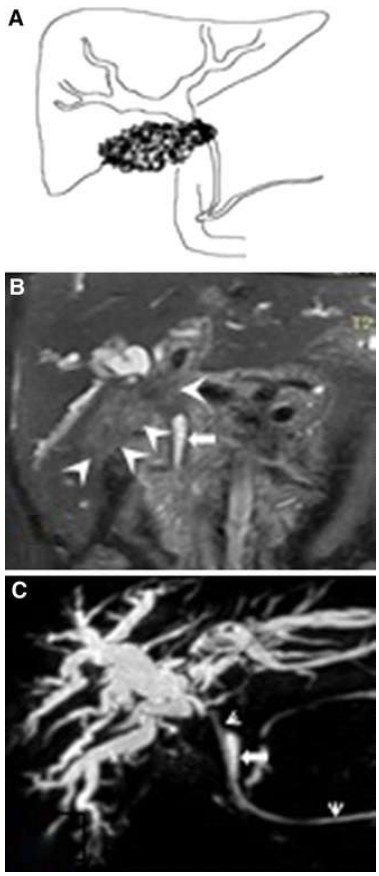

Fig. 2. Image a: schematic diagram of mass forming type of gall bladder carcinoma. Image b: T2 coronal image showing mass forming type of gall bladder carcinoma with local spread in hepatic hilum and involving CHD and part of CBD (arrow heads). Normal CBD is seen in the region of pancreatic head (arrow). Image c: MIP 3D MRCP sequence showing non visualization of gall bladder, CHD and part of CBD with intrahepatic bile duct dilatation. A thin linear T2 hyperintense structure in the region of CHD extending in the duodenal loop s/o biliary stent (arrow head). Normal CBD is seen in the region of pancreatic head

On contrast-enhanced CT, gall bladder carcinoma is seen as an enhancing mass in the region of gall bladder fossa, asymmetric wall thickening or as an enhancing large (>1 cm) intraluminal polypoidal mass.[37] MDCT with multi-planar reconstruction helps in evaluation of local spread (in liver, hepatic flexure of colon, duodenum) vascular involvement,

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metastatic lymphadenopathy, and metastasis (liver, peritoneal) which help in staging and determining the resectability of tumor.

Magnetic resonance cholangio pancreatography helps in evaluation of hilar extension of mass forming type of gall bladder carcinoma, which is seen as intrahepatic bile duct dilatation on MRCP sequences. Intraluminal polypoidal type is seen as a lesion arising from the wall of gall bladder casing peripheral filling defect. However, gall bladder calculus can also produce similar filling defect, hence additional T1, T2 W and contrast images are required for confirmation of diagnosis.

2.3 Cholangiocarcinoma

Cholangiocarcinoma is a tumor arising from the bile duct epithelium and it can arise from anywhere along the bile duct.

Anatomically cholangiocarcinoma can be classified as [38, 39]

1) Intrahepatic (peripheral) arises from beyond second-order bile ducts.
2) Perihilar (Klatskin tumors)-arises at the bifurcation of the hepatic ducts involving CHD and biliary ducts up to second-order bifurcation.
3) Extrahepatic-arising from CBD.

Morphologically, according to the Japanese Liver Cancer Group, tumor growth can be described as.

1) Mass-forming (exophytic)
2) Periductal (infiltrating)

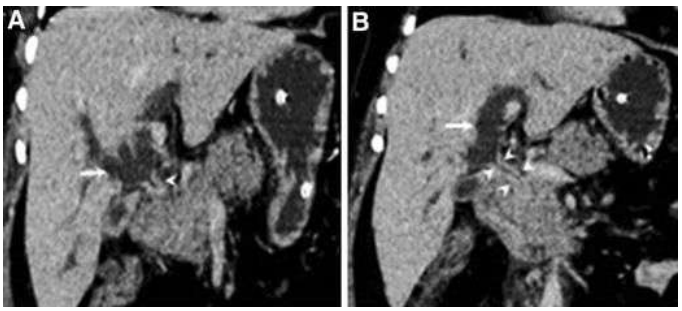

Fig. 3. a and b contrast-enhanced coronal images of CT scan showing long segment enhancing wall thickening involving CHD and CBD (arrow head) with secondary upstream dilatation of intrahepatic bile ducts (arrow)

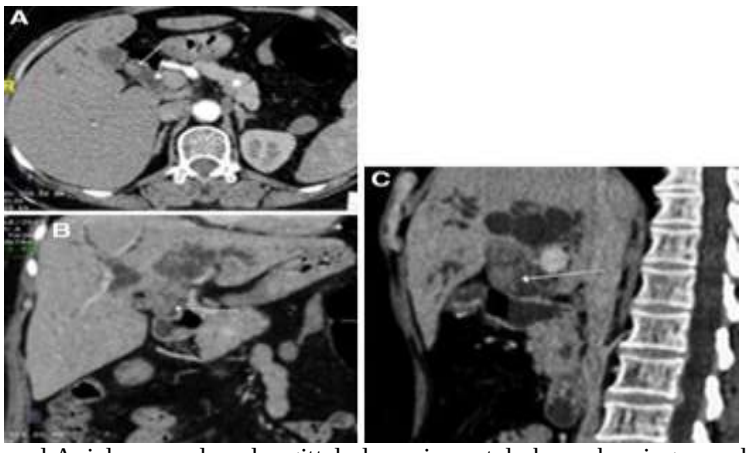

Fig. 4. Contrast-enhanced Axial, coronal, and sagittal planes in portal phase showing an enhancing endoluminal polypoidal mass (arrows) in the mid common bile duct, causing proximal biliary dilatation

2.4 Mixed (mass forming and periductal) pattern.

Out of all the types of cholangiocarcinoma, perihilar is the most common type, presenting as jaundice and shows infiltrating pattern. Bismuth and Corlette classified perihilarcholangiocarcinoma (Klatskin tumors) depending on extent of ductal involvement (Fig. 13).

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III. PROPOSED METHOD

Biliary radicles draining segments form right anterior bile duct which is oriented vertically, and biliary radicles draining segment form right posterior bile duct which is oriented horizontally. These right anterior and posterior bile ducts combine to form right hepatic duct (RHD). Biliary radicles draining segments II, III, and IV form left hepatic duct (LHD). The LHD and RHD combine together to form the common hepatic duct (CHD). Segment I is drained by separate biliary radicles draining in the angle of RHD & LHD. The extra-hepatic biliary system consists of CHD & common bile duct (CBD). CHD and cystic duct combine together to form the CBD. Both CBD and common hepatic artery are seen anterior to the portal vein, with CBD on the right and hepatic artery on the left. CBD normally measures 5 mm up to 50 years of age and shows an increment of 1 mm per decade. Pancreas is drained by PD which is embryologically derived from the fusion of the ventral duct of Wirsung (major PD) and the dorsal duct of Santorini (minor PD). Non-fusion of these ducts forms most common variant called pancreatic divisum seen in up to 14 % of population. The PD and CBD join together in the medial wall of D2 segment of duodenum forming a common channel. The terminal segments of CBD, PD, and this common channel are surrounded by a smooth muscle, called sphincter of Oddi.

Magnetic resonance cholangio pancreatography plays vital role in evaluation of biliary tumors and has replaced ERCP and percutaneous transhepatic cholangiography (PTC) in many centers. The reported sensitivity and specificity of MRCP compared to ERCP for the detection of bile duct malignancy are 81 and 100 % compared to 93 and 94 %, respectively [40]. The main advantage of MRCP over ERCP is that it can evaluate the extent of involvement and the dilated biliary tract beyond the level of obstruction which cannot be evaluated in ERCP due inadequate opacification of biliary tract distal to the obstruction.[41, 42] The main drawback of MRCP over ERCP is that it is only diagnostic.

The main feature of malignant biliary stricture on MRCP is long segment, irregular narrowing of biliary tract with upstream asymmetric dilation. The information which is required in the management of hilar carcinoma is the level of obstruction, extent of involvement, whether the involvement is up to primary or second-order branches and associated choledocholithiasis; all can be obtained from MRCP images. MRCP provides only endoluminal images from fluid, hence sometimes it could be inadequate to differentiate between benign and malignant stricture. In such cases, conventional T2, T1 W and contrast images give added advantage by visualization of malignant mass, metastasis, and metastatic lymphadenopathy.

Table 1: Association of CECT vs. OPERATIVE FINDING

	OPERATIVE FINDING		
CECT	**Detected**	**Not Detected**	**TOTAL**
Detected	19	1	20
Row %	95.0	5.0	100.0
Col %	82.6	50.0	80.0
Not Detected	4	1	5
Row %	80.0	20.0	100.0
Col %	17.4	50.0	20.0
TOTAL	23	2	25
Row %	92.0	8.0	100.0
Col %	100.0	100.0	100.0

Chi-square value: 1.2228; **p-value:**0.2688

In CECT -detected, 19(82.6%) patients had operation detected and 1(50.0%) patient had operation not detected. In CECT -not detected, 4(17.4%) patients had operation detected and 1(50.0%) patient had operation not detected. Association of CECT vs. operation finding was not statistically significant (p=0.2688).

Sensitivity: 82.6
Specificity: 50.0
Positive Predictive Value: 95.0
Negative Predictive Value: 20.0
Accuracy: 80.0% (TP+TN/Total)X100

IV. CONCLUSION

- Grading through changed CT severity index has a vast correlation with the need of ICU admission, period of ICU live and general period of health facility live.
- Modified CT grading correlates without delay with the improvement of nearby and systemic headaches.

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