

## MODERATELY DIFFERENTIATED DUCTAL CARCINOMA PANCREAS INVOLVING PERIAMPULLARY REGION

Shumaila Seemi Malik,<sup>1</sup> Safdar Ali Malik,<sup>2</sup> Muhammad Bin Zulfiqar,<sup>3</sup> Adila Iqbal<sup>4</sup>

### Abstract

**Background:** Pancreatic carcinoma has very poor prognosis. Curative management is only surgery. It is documented in literature studies that only 10 – 15% of patients suffering from adenocarcinoma go for surgical resection and surgery is radical in about half of these cases.<sup>1</sup> In this case we will discuss that how imaging, ultrasonography in usual and CT in particular are used to identify patients with probable resectable tumors.

**Methods:** We report a case of 65 years old man who referred to us for imaging from surgical emergency department with complains of obstructive jaundice. Ultrasonography revealed a hypo echoic mass in periampullary region with dilatation of common bile duct, Intra hepatic biliary channels, pancreatic duct and distension of Gall Bladder. CT scan showed a heterogeneously enhancing mass in periampullary region in relation to head of pancreas. There was no evidence of

any vascular invasion.

**Results:** The patient underwent pancreaticoduodenectomy according to Whipple's procedure. Histological examination of the specimen proved a moderately differentiated ductal adenocarcinoma of the pancreas.

**Conclusion:** With the help of imaging USG in usual and CEMDCT in particular, a radiologist can play major role to guide surgeon about resectability of tumor, while describing the involvement of surrounding structure and size of tumor.

**Introduction:** Incidence of Pancreatic carcinoma is 6-7 per 100,000 per year in Western Europe. Among these most common (85%) are ductal adenocarcinoma, have male predominance (male: female 1.5:1) and usually occur above 6<sup>th</sup> decade of life.<sup>2</sup> Whether tumors are small or large, majority (above 80%) are unresectable at time of diagnosis due to advance local extension (40%) and distant metastasis in Liver and Lymph nodes.<sup>3</sup> Computed tomography (CT) is the imaging investigation of choice as it is easily available and highly sensitive and specific to diagnose and stage pancreatic adenocarcinoma.

**Key Words:** Periampullary, Tumor resectability, pancreatic mass.

**Abbreviations:** CEMDCT (Contrast Enhanced Multi Detector Computed Tomography), CBD (Common Bile Duct), IHBC (Intra Hepatic Biliary Channels), MPR (Multi Planar Reconstructions), MIP (Maximum Intensity Projection).

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Malik S.S.<sup>1</sup>  
Associate Professor  
Department of Radiology, AIMC / Jinnah Hospital, Lahore

Malik S.A.<sup>2</sup>  
Professor of Radiology, SIMS / Services Hospital, Lahore

Zulfiqar M.B.<sup>3</sup>  
Dept of Radiology, Services Hospital, Lahore

Iqbal A.<sup>4</sup>  
Department of Radiology, Services Hospital, Lahore

### Case Report

A 65 years male patient referred to radiology department with h/o Yellowish discoloration of body for 3 weeks, pruritus, clay colored stools and dark color urine. Associated h/o anorexia and nausea was also there.



**Fig. 1:** A heterogeneous mass lesion with predominant hypo-echoic component seen in relation to head of pancreas with dilation of CBD which measures 1.8 cm.



**Fig. 2:** CBD is dilated and measures 1.8 cm.

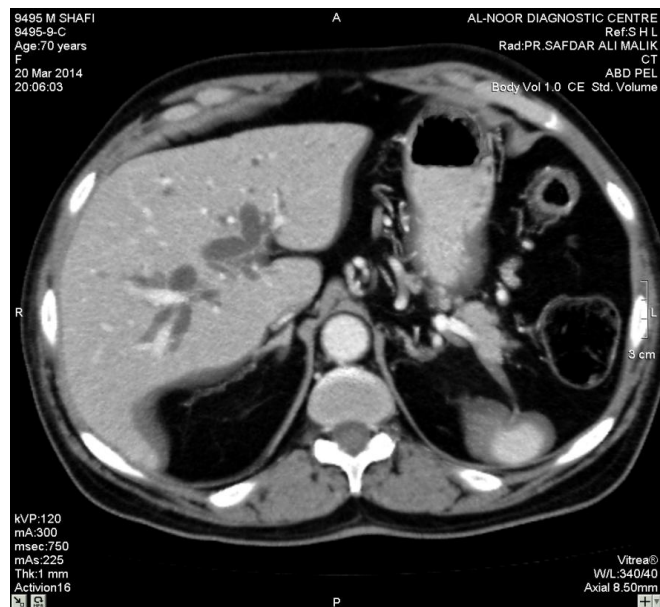
His laboratory reports showed elevated serum bilirubin level up to 20 mg/dl, ALT 86 (normal value up to 45), AST 90 (Normal value up to 50) and alkaline phosphatase was markedly high up to 950 (Normal value up to 295).

Ultrasound reveals heterogeneous mass lesion in the periampullary region measuring approximately 2.5 x 2.5 cm. This mass lesion was associated with head of pancreas (Fig. 1) leading to dilatation of intrahepatic biliary channels, CBD and pancreatic ducts (Fig. 2).

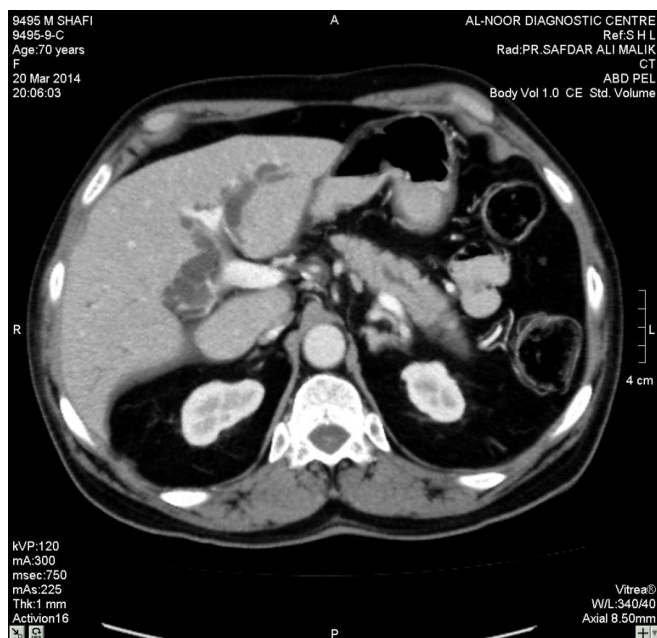
After Ultrasonography a preliminary diagnosis of ampullary/periampullary mass was made.

To demonstrate any invasion of surrounding vasculature, extent of tumor, origin of tumor and to help surgeon to decide whether tumor is resectable or not, we performed CT scan abdomen on early Porto –venous phase and MPR, MIP and 3-D reconstruction was also done.

CT imaging (Figs 3 – 7) showed a heterogeneously enhancing mass lesion in periampullary region in relation to head of pancreas measuring approximately 2.8 x 2.6 cm. CBD, IHBC and gall bladder were distended. There was no evidence of any perilesional fat stranding, any adjacent lymphadenopathy, and any localized metastatic deposits in the surrounding structures. MIP & 3D Surface rendered Images confirmed that there was no vascular invasion (Fig. 8).



**Fig. 3:** CECT shows dilatation of intrahepatic biliary channels.



**Fig. 4:** CECT shows dilatation of pancreatic duct which measures 3 – 4 mm.



**Fig. 5:** CECT transverse view shows dilatation of CBD upto 1.8 cm with abrupt narrowing by a mass lesion in periampullary region in-relation to head of pancreas. Gall bladder also distended.

On the basis of all these Imaging findings we made a diagnosis of periampullary growth with most probable and likely origin from head of pancreas. As there was no evidence of any vascular invasion we

comment this tumor as resectable. Patient was operated (Whipple procedure) successfully.



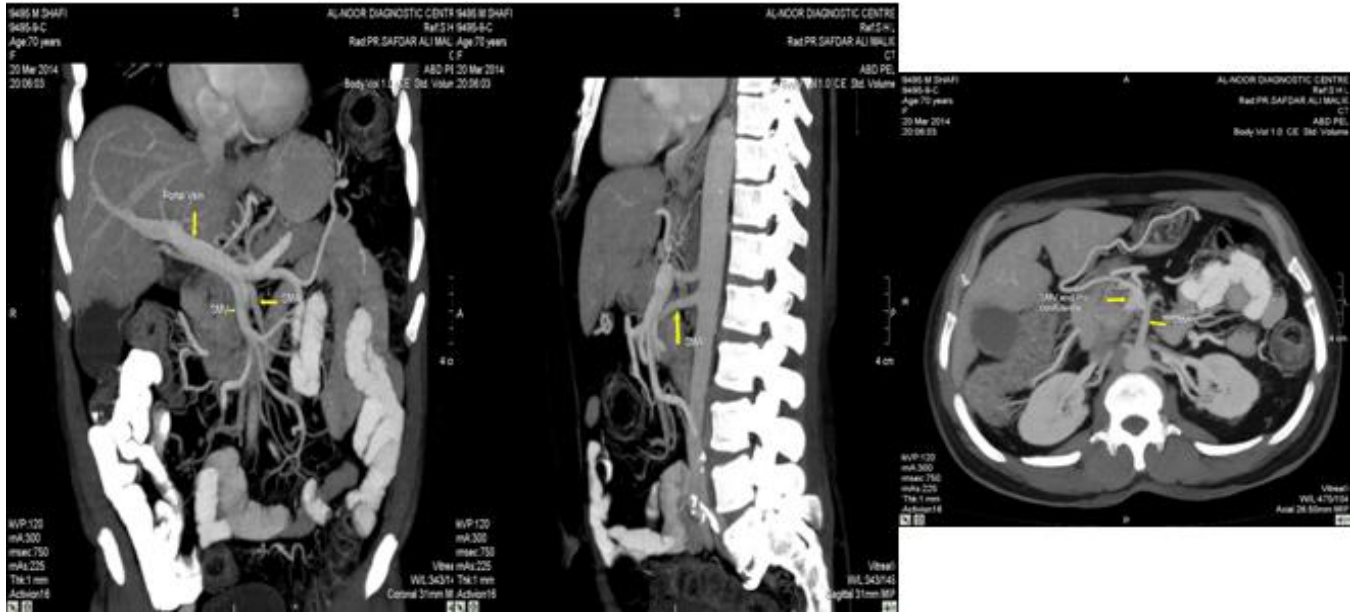
**Fig. 6:** CECT shows approximately 2.8 × 2.6 cm heterogeneously contrast enhancing mass in periampullary region in relation to head of pancreas.



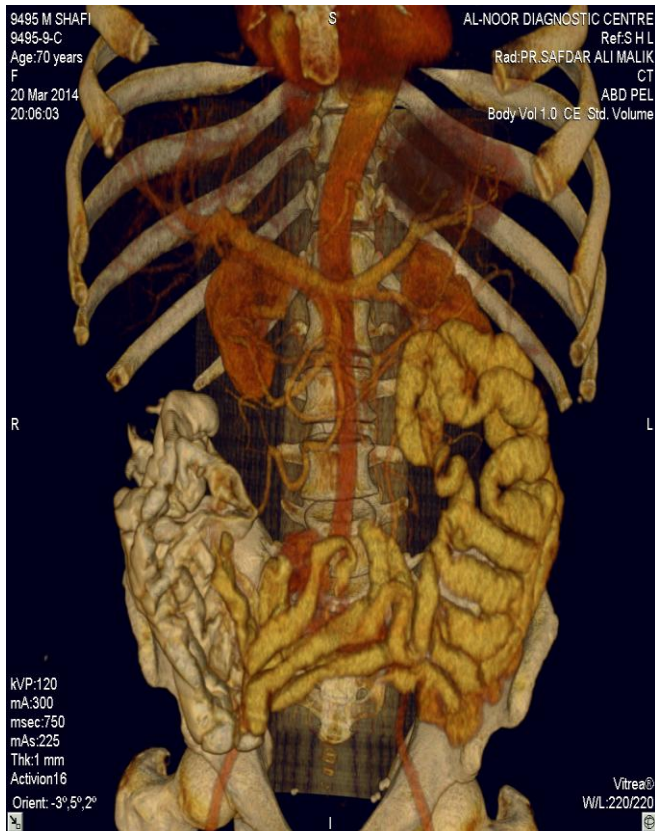
**Fig. 7:** CECT coronal images demonstrate 1.8 cm dilated CBD with abrupt narrowing by periampullary mass lesion. Pancreatic duct and gall bladder are also distended.

### Discussion

Among Pancreatic tumor almost 75% involve head region with limited occurrence in body (15%) and tail (10%). Pancreatic head tumors are usually diagnosed



**Fig. 8:** MPR images with MIP show no evidence of any vascular invasion.



**Fig. 9:** 3-D Surface rendered CT image shows normal opacification of portal venous system with no evidence of any invasion by mass lesion.

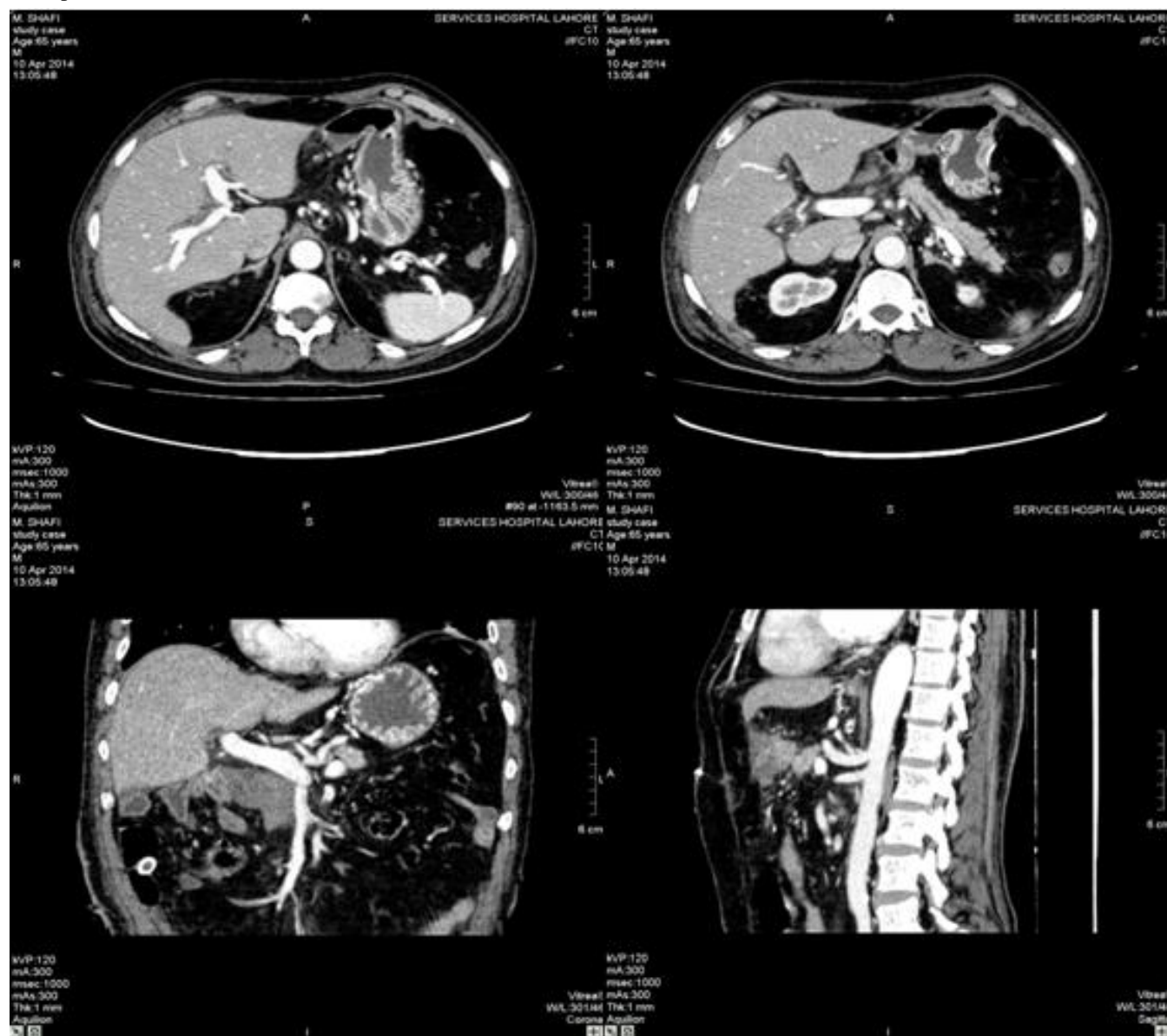


**Fig. 10:** Operative specimen of the patient.

at size of about 3cm while of body and tail at much larger size because of late presentation and non-specific symptoms.

The tumors of ampullary region and of distal common bile duct may also involve pancreatic head and they are together named as periampullary tumors.<sup>1</sup> When these tumors involve CBD either by infiltration or compression they cause painless obstructive jaundice.

Postoperative CT done



**Fig. 11:** Post-operative scan demonstrates reversal of dilatation of IHBC, CBD and pancreatic duct. There is no evidence of any localized fluid collection, any residual mass lesion. Visible vasculature is also normal. Patient’s resected specimen was sent for histopathology which turned out to be Moderately Differentiated Ductal Adenocarcinoma of Pancreas.

Imaging studies are vital in establishment of diagnosis and management of patients with pancreatic adenocarcinoma. Aim is to make early diagnosis and identification of resectable lesions.

### Role of Ultrasound

First line imaging technique is ultrasound for diagnosis

and evaluation of pancreatic head tumors. It can help in determination of the level of obstruction in most cases having sensitivity > 90%. Pancreatic head tumors are usually hypo echoic and cause double duct sign as a typical feature which is dilatation of pancreatic duct and common bile duct. This sign is taken as indirect evidence of pancreatic head mass even if tumor itself not visible. US is 76% sensitive and 75% specific and has limited role to differentiate resectable from

unresectable ones.<sup>4</sup>

However endoscopic USG has a high role in detecting small tumors especially of < 2 cm which can be overlooked on CT.

**Role of CT**

CT is highly sensitive in detection of pancreatic tumors its sensitivity ranges from 89 – 97% and increases with increasing size and has low sensitivity for small tumors < 2 cm.<sup>5</sup> Pancreatic carcinoma is usually hypo vascular tumor, so most often it presents as a hypo attenuating mass on a CECT, which is usually ill – defined. If tumor is small and no direct evidence on CECT then indirect signs are helpful i.e. double duct sign, atrophy of the pancreatic tail, or fullness of the pancreatic head.<sup>5</sup>

<b>CT PROTOCOLS<sup>8</sup></b>
Unenhanced CT Slice thickness 5 mm 130 ml contrast (3 cc / sec) Pancreatic phase Slice Thickness 2 mm with MPR

Due to not having capsule pancreatic tumors easily involve adjacent structures including vessels (coeliac Axis, Superior Mesenteric Vessels, Gastroduodenal artery and confluence of Portal Vein) and Viscerae (Stomach, Duodenum, Colon, Mesocolon). On the basis of this spread tumor is stated as resectable or Unresectable.<sup>6</sup>

CT is 100% sensitive in depicting resectability of pancreatic tumor. Involvement of Lymph nodes in peri-pancreatic area is not a contra-indication of resection. Similarly if there is only limited growth into duodenum or gastro duodenal artery tumor can still be resected as it can be dissected en-bloc with the tumor.<sup>7</sup> Tumor infiltration into adjacent viscerae (stomach, mesocolon, colon, Aorta or IVC) is absolute criteria of unresectability. Other definite signs of unresectability are involvement of hepatic, Para-aortic, and mesenteric lymph nodes distant to pancreas as well as involvement of Vessels like coeliac axis, SMA and Portal vein.<sup>8</sup>

Hepatic metastases and distant lymph node metastases should always be confirmed by histo-pathological examination before undergoing exploratory laparotomy.

**Resectable or Unresectable**

<b>RESECTABLE</b>	<b>UNRESECTABLE</b>
No / Limited vascular involvement < 180° Only peri pancreatic lymph nodes Patent PV and SMV Limited infiltration in fat or duodenum Involvement of gastroduodenal artery	> 180° vessel contact Paraortic, Truncal, mesenteric Lymph nodes Involvement of portal vein, hepatic artery, Extension into stomach, colon, mesocolon Distant (liver, peritoneum) metastasis <sup>1,7,8</sup>

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