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Unique Contraindication for Resectable Pancreaticoduodenal Cancer

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Abstract

In this report, we present a patient with a presumably resectable mass at the head of the pancreas. Although the hepatobiliary team initially suggested Whipple procedure (pancreaticoduodenectomy) to extirpate the mass, pre-operative triphasic pancreatic protocol CT demonstrated a unique abnormal anatomical variant of the celiac axis - Superior Mesenteric Artery (SMA) anastomosis, a rare contraindication for performing the pancreaticoduodenectomy.

Keywords: Pancreaticoduodenectomy; Whipple procedure; Celiac trunk; Superior mesenteric artery (SMA); Blood vessels variants

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Introduction

Pancreaticoduodenectomy, occasionally referred to as Whipple procedure, is still the only potentially curative treatment for pancreatic cancer [1,2]. During this procedure the surgeon blocks the blood supply to the pancreas and duodenum from the Celiac trunk [3]. Contraindications for conducting pancreaticoduodenectomy are metastatic disease and encasement of major vessels such as celiac artery, inferior vena cava, or superior mesenteric artery. Anatomical variants rarely contraindicate Pancreaticoduodenectomy surgery. We hereby report our experience with a patient presenting with a presumably resectable mass at the head of the pancreas, which had a rare and unusual anatomical variant that contraindicated the pancreaticoduodenectomy.

Case Report

A70-year-old male presented to the emergency department with acute painless jaundice and a loss of 22 pounds during the month prior to admission. Computed Tomography (CT) performed in the ER demonstrated a presumably resectable mass at the head of the pancreas with secondary dilation of the Common Bile Duct (CBD) as well as a pseudocyst at the distal pancreatic tail. The hepatobiliary team initially suggested Whipple procedure (pancreaticoduodenectomy) to extirpate the mass. However, pre-operative triphasic pancreatic protocol CT demonstrated a rare and unique abnormal anatomical variant of the celiac axis - Superior Mesenteric Artery (SMA) anastomosis; a constricted Celiac trunk which doesnot supply the pancreas head via the Gastroduodenal Artery (GDA) (PanelA) (Figure 1). Instead, the pancreas, the liver and the spleen were supplied by multiple anastomoses originating from the SMA (PanelB) (Figure 2). Unfortunately, these findings were a contraindication for performing the pancreaticoduodenectomy, and the patient died from inevitable progression of the disease.

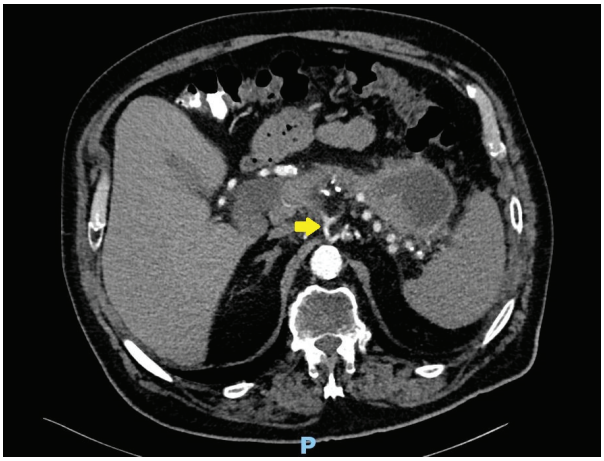

Figure 1: PanelA: Computed Tomography (CT) demonstrating constricted celiac trunk and anastomoses originating from the Superior Mesenteric Artery (SMA) supplying the Pancreas, Liver and the Spleen.

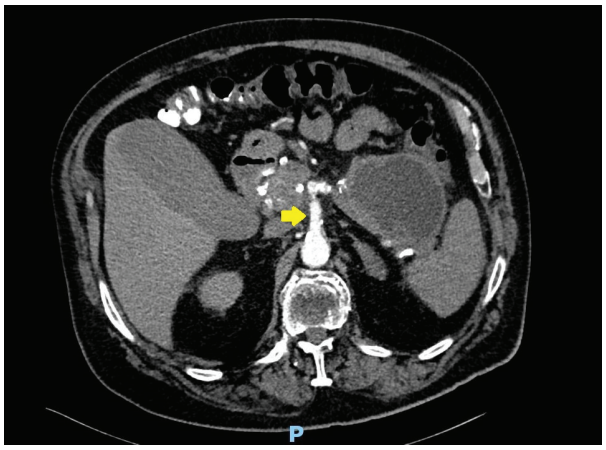

Figure 2: PanelA: Computed Tomography (CT) demonstrating the Superior Mesenteric Artery (SMA) and unique blood vessels stems from it to supply the Pancreas, Liver and the Spleen.

Discussion

Pancreaticoduodenectomy is currently the only known curative treatment for non-metastatic cancer of the head of pancreas [1,2]. Resection of a mass from the head of thepancreas requires shutting off the blood supply before excising the organ. Gaujoux et-al. have shown that ischemic complications are an underestimated cause of death after Whipple procedure and are due to preexisting vessels abnormalities, or intraoperative artery injury [3]. Previous authors have stated that "Establishing the exact variant of this blood supply is important before pancreatic surgery. Identifying the exact vascular anatomy may help in decision-making during surgery" [4].

In the current report we presented a patient who demonstrated a unique anatomical variant where his Celiac trunk was non-patent and the SMA compensated and supplied the circulation for all the upper abdominal organs. Our report raises the importance of demonstrating the direct pancreaticoduodenal blood supply prior to performing the Whipple procedure.

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