

The Anatomic Variant of the First Jejunal Branch of the Superior Mesenteric Vein: Does it Affect the Surgical Strategy in Pancreatic Head Cancer?

Superior Mezenterik Venin İlk Jejunal Dalının Anatomik Varyantı: Pankreas Başı Kanserinde Cerrahi Stratejiyi Etkiler Mi?

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ABSTRACT

Recently, we routinely performed “mesenteric approach”, includes exposing the superior mesenteric vein (SMV) and superior mesenteric artery (SMA) from inframesocolic root and the dissection continued cranially for pancreatic head cancer. This technique facilitates early assessment of tumor resectability prior to the irreversible step. However, the dissection of inframesocolic SMV to allow for identification of the SMA is occasionally challenging due to the complex anatomic course of the first jejunal trunk in relation to the SMA. Herein, we draw attention to the anatomical variation of the first jejunal branch of the SMV and report which approach facilitates pancreaticoduodenectomy in the presence of this variation.

Keywords; Pancreaticoduodenectomy, mesenteric approach, first jejunal branch, anatomical variation

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Tumor abutment of the superior mesenteric vein (SMV) or the portal vein confluence (SMV-PV) may not be accurately interpreted on high-quality preoperative cross-sectional imaging for pancreatic head cancer and is often an unexpected finding as just identified at the time of surgery. Furthermore, arterial infiltration is often discovered at the end of conventional pancreaticoduodenectomy (PD) dissection technique which often results in positive surgical margins. Thus, we now routinely carry out “isolated PD” using a “mesenteric approach”, includes exposing the SMV and superior mesenteric artery (SMA) from inframesocolic root and the dissection continued cranially for pancreatic cancer (1). This technique facilitates early assessment of arterial involvement and thus assess prediction of tumor resectability before taking the irreversible step to operate. Other advantages of this procedure include reducing congestion and bleeding from the pancreatic head by early ligation of inferior pancreaticoduodenal artery (IPDA) and easy to reconstruct the PV by end-to-end anastomosis. However, the dissection of inframesocolic SMV to allow for identification of the SMA is occasionally challenging due to the complex anatomic course of the first jejunal trunk with relation to the SMA.

ÖZET

Son zamanlarda pankreas başı kanserlerinde rutin olarak superior mezenterik ven (SMV) ve superior mezenterik arterin (SMA) inframezokolik kökten ortaya konulmasını ve kraniyal olarak diseksiyonunu içeren “mezenterik yaklaşım” tekniğini uyguladık. Bu teknik, geri dönüş olmayan adımdan önce tümör rezektabilitesinin erken değerlendirilmesini kolaylaştırır. Bununla birlikte, SMA'nın tanımlanmasına izin vermek için inframezokolik SMV diseksiyonu, ilk jejunal dalın SMA ile olan karmaşık anatomik seyri nedeniyle zaman zaman zorlayıcıdır. Burada SMV'nin ilk jejunal dalının anatomik varyasyonuna dikkat çekerek bu varyasyon varlığında hangi yaklaşımın pankreatikoduodenektomiye kolaylaştırdığını sunduk.

Anahtar Sözcükler: Pankreatikoduodenektomi, mezenterik yaklaşım, ilk jejunal dal, anatomik varyasyon

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The main trunk of the SMV is formed via its first order branches, the jejunal and ileal branches. The ileal branch usually courses vertically in a caudo-cranial direction and drains venous return from distal small bowel. The first jejunal branch has variable anatomy with relation to the SMA as it lies transversely either anterior (20 - 40%) or posterior to the artery, to carry venous drainage from the proximal small bowel (2)–(4). When an anterior coursing jejunal branch exists, a high rate of concomitant anomalous may also be present, including the ileal and jejunal branches merge together with the splenic vein without forming a main SMV trunk (3).

Early in the mesenteric approach, the anterior walls of the SMV and SMA are exposed by incising and extensive dissecting the mesentery from the lower border of the inferior duodenal flexura to the Treitz ligament. While patients with an anteriorly located first jejunal branch, exposure of the SMA is difficult during “mesenteric approach” (Figure 1).

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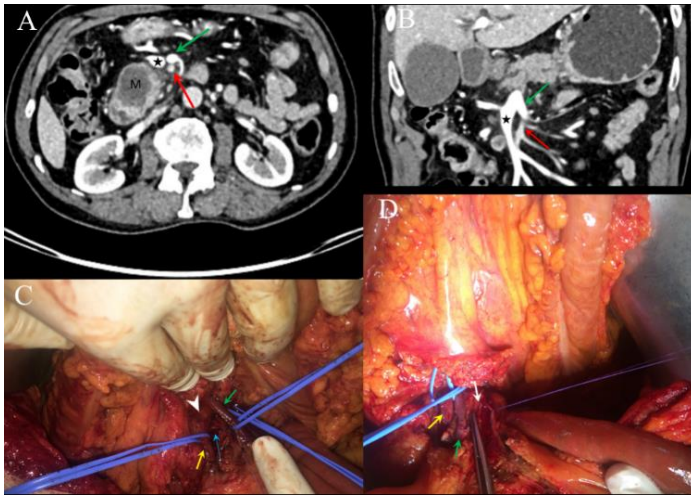


Figure 1: A 63 year-old man with pancreatic head tumor. Axial (A) and coronal (B) CT images show first jejunal trunk (green arrows) crossed anteriorly to the SMA (red arrows) and merged with large ileal branch (black star). Note the necrotic mass lesion of the head of the pancreas (M) with lack of invasion of SMV and SMA. Intraoperative photographs (C), (D) show exposure of the SMA, SMV and its first-order branches by dissecting the mesenteric root. Note the anterior coursing first jejunal branch (green arrows). White arrowhead indicates the lack of a main SMV trunk that ileal (yellow arrows) and jejunal branches joining at splenoportal confluence. Blue and white arrows depict early ligation of IPDA and ligation of the 1st jejunal artery, respectively.

Furthermore, unaware of the variation consisting of an anterior coursing jejunal branch could lead to venous injury, often results in uncontrolled hemorrhage and potentially injury to the SMA that can inadvertently occur in an attempt to control venous bleeding. However, in cases where the jejunal branch lies anterior to the SMA, the small venous branches from the uncinate usually drain into the ileal branch (2). In this way, it is easier to isolate SMV from the uncinate process. Thus, an anterior coursing jejunal branch makes SMA exposure less difficult and this also reduces the risk of iatrogenic injury in conventional PD dissection technique.

Isolated tumor involvement of the variational main SMV trunk may extend out either of its first-order branches or into the root of mesentery. Contrarily to “mesenteric approach”, complete isolation of these vessels and determination of tumor involvement is not carried out in the early step of conventional PD dissection technique. Furthermore, without adequate length of vein mobilization compromises creation of a tension-free repair when the need for venous resection for tumor involvement. However, clearance of the connective tissues around the ileal and jejunal branches in the mesenteric root allows accurate assessment of tumor involvement and complete mobilization of veins which facilitates to provide extra vessel length in order to relieve tension during vascular repair. Therefore, if there is a suspicion of SMV-PV invasion in cases with an anteriorly located first jejunal branch, to combine both “conventional PD” and “isolated PD” dissection technique can complement each other.

In conclusion, conventional PD dissection technique is the standard procedure to be chosen when awareness of an anterior coursing first jejunal branch with preoperative computed tomography (CT) scans. This dissection technique is more reliable in terms of both exposing the SMA and preventing unexpected hemorrhage in patients with an anteriorly located first jejunal branch. As a result, to identify a patient’s mesenteric venous anatomy and tumor extension can affect the surgical strategy.

Conflict of interest

No conflict of interest was declared by the authors.

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