



ORIGINAL RESEARCH PAPER

Anatomy

UNUSUAL PRESENTATION OF PORTAL VEIN

KEY WORDS: Anterior Portal Vein, Pre-pancreatic portal Vein, Variations of portal vein

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ABSTRACT The portal vein (PV), which provides the bulk of nutritive blood supply to the liver, is formed by the confluence of the superior mesenteric vein (SMV) and splenic vein (SV) posterior to the neck of the pancreas. We present an unusual variation of portal vein, noticed during dissection of pancreas and its relations. An unknown male cadaver of about 52 years of age was dissected for teaching of undergraduate medical students. During dissection, portal vein was found in the anterior aspect of the neck of pancreas.

INTRODUCTION

According to Williams et al. [1] and Gilfillan [2], the Portal Vein begins at the level of second lumbar vertebra by the convergence of superior mesenteric and splenic veins (SVs) anterior to inferior vena cava, posterior to the neck of pancreas. It enters the liver at the right end of porta hepatis, dividing into right and left stems.

With the increase in percutaneous hepatobiliary interventions and complex surgical resections, a thorough understanding of variants in PV anatomy is crucial. In most cases, preprocedural cross sectional imaging is available, and although PV variants are depicted on the images, they are not commonly reported.[3]

preduodenal portal vein (PDPV) was first described by Knight in 1921,[4] with an incidence of about 1 in 10000.[5] PDPV is one of the rare causes of duodenal obstruction. In a large series of patients with congenital duodenal obstructions, PDPV was found in only 4% case. [6]

We present a case of pre-pancreatic portal vein in a 52-year, male cadaver found during dissection.

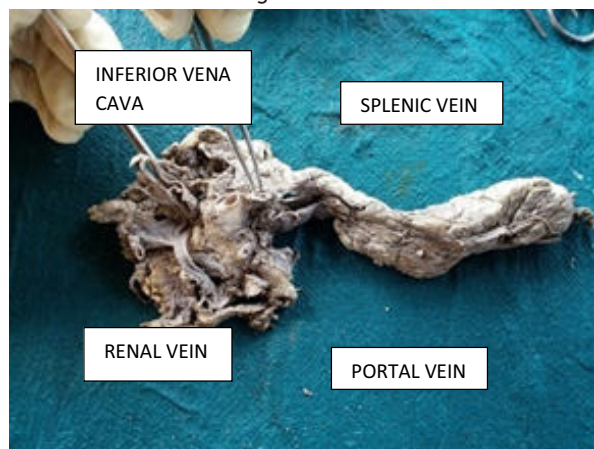


Figure 1: specimen showing pre-pancreatic portal vein

DISCUSSION

The etiology of these variations can be best understood by reviewing the normal embryology. The development of the portal venous system occurs simultaneously with the development and rotation of stomach. [7]

The different types of portal vein formation noted were as follows [8].

Type I – Portal vein is formed by confluence of superior mesenteric vein and splenic vein.

Type II – Portal vein is formed by confluence of superior mesenteric vein, inferior mesenteric vein and splenic vein.

Type I –Subtype according to termination of inferior mesenteric vein.

Type Ia – Inferior mesenteric vein terminates into splenic vein (normal).

Type Ib – Inferior mesenteric vein terminates into superior mesenteric vein

Embryologically, the portal vein is formed in the second month of gestation by selective involution of the vitelline veins, which have multiple bridging anastomoses anterior and posterior to the duodenum cranial intrahepatically, middle behind duodenum, caudal in front of duodenum. Superior mesenteric vein joins with right vitelline vein and splenic vein joins with the left vitelline near its anastomosis. The proximal ventral anastomosis becomes left branch of portal vein, the dorsal anastomosis becomes the portal vein. The distal ventral anastomosis usually disappears. Alterations in the pattern of obliteration of these anastomoses can result in several variants. A prepancreatic portal vein is formed when the caudal ventral anastomosis persists instead of the middle one [3, 7].

The first case of prepancreatic portal vein was reported by Knight in 1921 during dissection of a cadaver. [4]

In 2010 Tomizawa et al. also reported 2 cases of prepancreatic postduodenal portal vein found in an enhanced CT scan in cases of sigmoid colon cancer with liver metastasis and breast cancer.[9]

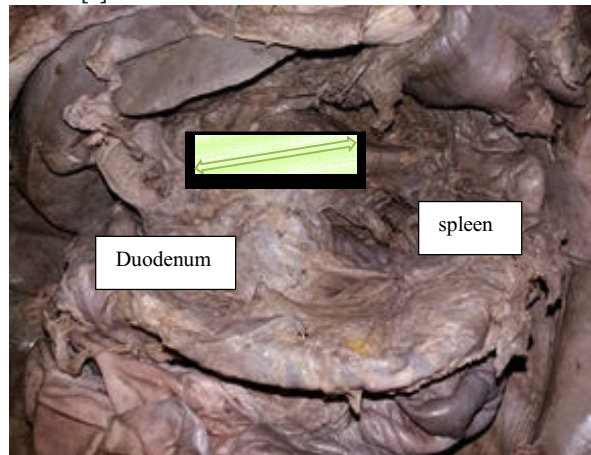


Figure 2- showing pancreas in situ in adults

CASE STUDY

An unknown male cadaver of about 52 years of age was dissected in the department of Anatomy, Assam Medical College, Dibrugarh, for undergraduate medical students. During routine dissections a variation in the formation of the portal vein was noticed.

Cause of the death was not mentioned in the cadaver report. On external examination, no obvious congenital anomaly was observed. On internal examination, no abnormal positioning of the abdominal organs seen. All the abdominal organs were in normal anatomical position. [Figure 2]. While relations of pancreatic head were observed a very unusual relation of pancreas in that adult cadaver was noticed, where portal vein was found in the anterior aspect of the neck of pancreas. Normally, at the medial end of inferior border, adjacent to the neck of the pancreas, the superior mesenteric vessels emerge from behind the gland. More laterally the inferior mesenteric vein runs under the border to join splenic vein on the posterior surface. In the present study, the superior mesenteric vessels were present in front of the junction of head and neck region. The splenic vein was running in the posterior surface of the pancreas and then emerged anteriorly around the inferior border at the junction of neck and body. Thereafter, the splenic vein joined with the superior mesenteric vein to form the portal vein in front of the neck of the pancreas. Thus, pre-pancreatic portal vein was formed by the union of splenic vein and superior mesenteric vein. [Figure 1] Thereafter the portal vein thus formed passed in front of the neck region of the pancreas. However, the bile duct and inferior vena cava was present posterior to the head region.

CONCLUSIONS

Portal vein variants are asymptomatic but knowledge of these variants helps in accurate diagnosis of cross-sectional imaging, also important to avoid surgical hazards like portal vein ligation, resection, intraoperative haemorrhage. Thus, it reduces the complication rates of surgical and radiological interventional procedures [10].

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