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CASE REPORT

Unusual course of the aberrant right hepatic artery running through the pancreatic parenchyma during modified Frey's procedure

Trajet atypique d'une artère hépatique aberrante passant à travers le pancréas au cours d'une intervention de Frey modifiée

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KEYWORDS
Aberrant right hepatic artery;
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Anatomical variant

Summary We report a variation of an aberrant right hepatic artery arising from the superior mesenteric artery and crossing into pancreatic head without other hepatic artery substitution. The variant was discovered during radiological examinations in a patient with symptomatic chronic pancreatitis requiring Frey's procedure with reinsertion of the common bile duct into the pancreatic head. An aberrant right hepatic artery arising from the superior mesenteric artery is present in 10 to 20% of case and its course is usually retro-pancreatic. The course of this artery into the pancreatic head is uncommon and can be present up to 10% in case of ARHA. Knowledge of an aberrant right hepatic artery crossing into the pancreatic head is important before pancreatic surgery in order to avoid surgical complications, especially for liver necrosis.

Abbreviations: PD, Pancreatoduodenectomy; ARHA, Aberrant right hepatic artery; SMA, Superior mesenteric artery; CBD, Common bile duct.

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MOTS CLÉS
Artère hépatique droite aberrante ;
Intervention de Frey ;
Pancréatite chronique ;
Variation anatomique

Résumé Nous décrivons une variation d'une artère hépatique droite aberrante naissant de l'artère mésentérique supérieure et traversant la tête du pancréas sans autres substitutions artérielles hépatiques. Cette variation anatomique a été découverte au cours de l'évaluation radiologique d'un patient ayant une pancréatite chronique symptomatique nécessitant une intervention de Frey avec réinsertion de la voie biliaire principale dans la tête du pancréas. La présence d'une artère hépatique droite aberrante naissant de l'artère mésentérique supérieure est présente dans 10 à 20 % des cas et son trajet est habituellement rétro-pancréatique. Le trajet intra-pancréatique de cette artère n'est pas classique et retrouvé dans 10 % des cas lors d'artère hépatique droite aberrante. La connaissance de cette variante anatomique est importante en cas de chirurgie pancréatique afin d'éviter des complications postopératoires, en particulier une nécrose hépatique.

Introduction

Preoperative evaluation of the arterial and portal vascularization before pancreatic surgery is primordial by using CT-scan, magnetic resonance imaging or angiography. As part of pancreatic surgery (as in case of pancreatoduodenectomy (PD)), looking for a right hepatic artery arising from the superior mesenteric artery is part of the systematic preoperative evaluation to carry as well as a search for arcuate ligament or left gastric vein [1] that necessitated an adaptation of the surgical procedure.

The modal arterial liver vascularization depends on the proper hepatic artery arising from the common hepatic artery emerging from the celiac trunk [2]. Arterial liver vascularization has many variants for which the main classification used is Michels's classification [3], modified more recently by Hiatt et al. [4]. In 10—20% of cases depending on series [5], a right hepatic artery, also called aberrant right hepatic artery (ARHA) may be present. It arises from the right edge of the superior mesenteric artery (SMA). Its course is usually posterior to the pancreatic head and lies on the right border of the common bile duct (CBD), in front of the portal vein.

The vascularization of liver can be modified, as in some cases there is no substitute vascularization from the proper hepatic artery or a left hepatic artery. Several studies have shown that in the presence of an ARHA, its course is usually retro-pancreatic and its knowledge, during PD, is essential to avoid injury and can cause liver necrosis or other postoperative complications. Few series have performed pancreatic surgery with an ARHA crossing in the pancreatic head where the conservation of this artery was impossible [6].

Most of those series concern pancreatoduodenectomy (PD) for adenocarcinoma. To our knowledge, this is the first report of this variant of ARHA whose course is intra-pancreatic in which a modified Frey's procedure for symptomatic chronic pancreatitis was performed.

Case report

We report the case of a 53-year-old man who was referred to our institution for jaundice, without cholangitis. This patient had history of chronic pancreatitis evolving since 8 years without previous endoscopic procedures and diabetes mellitus.

There were a cholestasis with an icteric syndrome (γGT = 5 N, total bilirubin/conjugated bilirubin = 50/30 μmoL/L (normal 5—17/1—4 μmoL/L)), abdominal CT-scan with arterial and portal phase showed dilatation of CBD over 14 mm secondary to calcifications of the pancreatic head. The pancreatic head measured 30 × 40 mm long (inflammatory pancreatic head mass) and was associated with multiple calcifications without dilatation of the main pancreatic duct. During preoperative imaging, an ARHA arising from the SMA was discovered. The ARHA was crossing the pancreatic head and supplied the whole liver (Fig. 1). According to preoperative imaging, there was no other hepatic artery substitution (Type 3 of Michels's classification (Table 1)).

This case was discussed in multidisciplinary meeting and faced symptomatic chronic pancreatitis as jaundice, without cholangitis, associated with uncommon arterial anatomical variant, a PD or a modified Frey's procedure was proposed. A modified Frey's procedure was preferred due to lower postoperative complications and mortality.

Table 1 Classification of anatomical hepatic artery variants according to Michels [3].
Classification des variations anatomiques artérielles hépatiques selon Michels [3].

Type	Description
1	Normal
2	Replaced LHA from LGA
3	Replaced RHA from SMA
4	Replaced RHA + LHA
5	Accessory LHA
6	Accessory RHA
7	Accessory RHA + LHA
8	Replaced RHA + accessory LHA or replaced LHA + accessory RHA
9	CHA from SMA
10	CHA from aorta

LHA: left hepatic artery; LGA: left gastric artery; RHA: right hepatic artery; SMA: superior mesenteric artery; CHA: common hepatic artery.