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Agenesis of the Celiac Trunk, A Rare Vascular Variant: A Case Report

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Abstract **Case Report**

Vascular anatomical variants of the abdomen are very frequent. Knowledge of these variants is of paramount importance in clinical practice, particularly in surgery, because of the related therapeutic implications. Agenesis of the celiac trunk is one of the rare anatomical variants of the abdominal aorta. A limited number of cases have been reported in the medical literature. We report a case of agenesis of the celiac trunk, with separate emergence of its three branches directly from the abdominal aorta, discovered incidentally during a computed tomography (CT)scan performed as part of extension assessment of gallbladder adenocarcinoma.

Keywords: Agenesis of the celiac trunk, anatomical variant, celiak trunk, computed tomography.

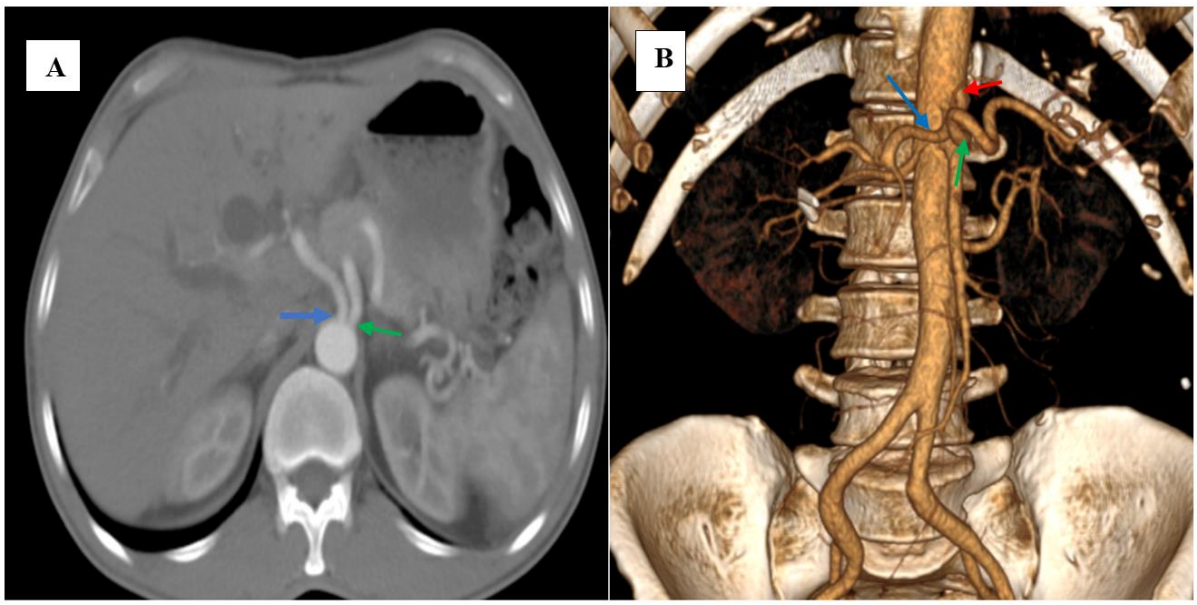
INTRODUCTION

The celiac trunk, also known as the celiac artery, is the first branch of the abdominal aorta, arising anterior to the T12-L1 vertebral body. It is 1.5 to 2 cm long. It divides into three branches: the left gastric artery, the common hepatic artery and the splenic artery, which supply the liver, stomach, abdominal esophagus, spleen, upper duodenum and pancreas (Standring, 2008). The trifurcation of the celiac trunk also known as the Tripus Halleri was first described by Swiss anatomist and physicist Albrecht Von Haller in 1756, and is considered the normal aspect of the celiac trunk, although many variants have been described (Haller, 1756). According to Tandler's hypothesis (1904), these anatomical variants may be the result of abnormal embryogenesis of the primitive ventral (splanchnic) segment that irrigates the intestine and its derivatives.

CASE REPORT

We report the case of a 70-year-old patient with a history of recurrent cholecystitis who underwent laparoscopic cholecystectomy. The patient was referred to the Radiology Department of Ibn Tofail Hospital, Marrakech, for the evaluation of a gallbladder adenocarcinoma, diagnosed after anatomopathological examination of the cholecystectomy specimen. Clinical examination was unremarkable, except for tenderness of the right hypochondrium. Thoraco-abdomino-pelvic computed tomography (CT) without and with contrast injection at the arterial and portal times revealed complete agenesis of the celiac trunk type V according to Morita's classification, with the common hepatic, left gastric and splenic arteries emanating directly from the anterior aspect of the abdominal aorta **(Figures A and B).**

Other injuries included tissue infiltration of the gallbladder bed, and moderate dilatation of the common bile duct with no detectable obstruction. There was no adenomegaly or secondary localization. After a multidisciplinary concertation meeting, a chemotherapy protocol was instituted in this patient.



Abdominal CT scan at arterial time: (a)- Axial section: separated emergence of the common hepatic artery (blue arrow) and splenic artery (green arrow), (b)- 3D reconstruction: separated emergence of the 3 branches, common hepatic artery (blue arrow), splenic artery (green arrow) and left gastric artery (red arrow)

DISCUSSION

Celiac trunk agenesis is a rare variation of the celiac trunk in which the 3 main branches arise independently of the aorta. It was first reported in 1832 by Geoffrey Saint Hilaire (Yi *et al.*, 2008). Its prevalence varies from 0.19% to 2.6% according to studies derived from cadaveric anatomical dissections, surgical interventions and radiological explorations (Fahmy *et al.*, 2015), (Venieratos *et al.*, 2012), (Olewnik *et al.*, 2017). In our case, agenesis of the celiac trunk was discovered incidentally by an abdominal CT scan with 3D reconstruction.

The first classification to include absence of the celiac trunk as a morphological type was that of Morita (1935). This author proposed five types of variant for the celiac trunk: type 1 for the celiac trunk, type 2 for the hepatosplenic trunk, type 3 for the gastrosplenic trunk, type 4 for the hepatogastric trunk and type 5 for the absent celiac trunk. According to this classification, our case was classified as type 5 (primitive type).

Medical imaging plays a key role in the detection of these vascular anatomical variants, notably thanks to abdominal angioscanner with three-dimensional (3D) reconstructions, very useful for demonstrating and studying the details of anatomical structures with precision (Jin *et al.*, 2007).

In clinical practice knowledge of the anatomical variants of the celiac trunk is essential as it has therapeutic implications particularly during interventional radiology procedures (chemo-embolization of the pancreas and liver tumors) as well as in surgeries of this region such as en bloc resection of the celiac trunk with total gas gastrectomy and distal pancreatectomy for the treatment of advanced gastric cancer) (Matusz *et al.*, 2012).

CONCLUSION

Celiac trunk agenesis is one of the rare vascular anatomical variants. Angioscanner imaging plays a key role in the discovery of these variants. Knowledge of vascular anatomical variants is of paramount importance in various surgical, diagnostic and endovascular procedures.

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