

## A CASE OF MISSING A. HEPATICA COMMUNIS ASSOCIATED WITH ABERRANT ORIGIN OF AA. HEPATICA DEXTRA AND SINISTRA

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### ABSTRACT

A complex variation of *truncus celiacus* was discovered during routine anatomical dissection of a 65-year old female cadaver. After short course it divides into *arteria gastrica sinistra*, *arteria lienalis* and *arteria gastroduodenalis*. The missing *arteria hepatica sinistra* is replaced by a branch of *arteria gastrica sinistra*, and *arteria hepatica dextra* stems from *arteria mesenterica superior*. The left hepatic artery passes between the two sheaths of *ligamentum hepatogastricum* in its upper third and reaches *porta hepatis* via *sulcus ligamenti venosi*. The right hepatic is separated from the superior mesenteric artery just under the *incisura pancreatica* and crosses behind *vena mesenterica superior*. It continues in the free margin of *ligamentum hepatoduodenale* posteriorly to the *ductus choledochus* and to the right of *vena portae*. Upon entrance in the hepatoduodenal ligament the artery separates *arteria pancreaticoduodenalis superior posterior*. *Arteria gastroduodenalis* has a similar anatomical course to the course of the “normal” *arteria hepatica communis* in the base of *ligamentum hepatoduodenale*. It separates *arteria gastrica dextra*, *arteria pancreaticoduodenalis superior anterior* and continues as expected into *arteria gastroomentalis dextra*. The incidence of the individual described variations (according literature data) is 10% - 19% for the left hepatic artery starting from the left gastric artery and 5% - 9% for the right hepatic artery starting from the superior mesenteric artery. The variations of the celiac trunk and the hepatic arteries are of greatest importance for the classical and minimum invasive surgical approach to the liver, gall bladder and hepatoduodenal ligament (e.g. cholecystectomy, tumor resection of liver, pancreas head or duodenum, aquisition of donor material for liver transplantation). The knowledge of the possible deviations in the hepatic arterial tree has also a significant impact on the interpretation of hepatic anatomy based on imaging data received by means of hepatic angiography, 3d computed tomography, CT angiography etc.

**Key Words:** *Celiac trunk variations, hepatic artery variations*

### INTRODUCTION

*Ligamentum hepatoduodenale* is a subject to a vast number of serious surgical interventions. The preoperative knowledge of variant celiacomesenteric arterial anatomy is of a great value in upper abdominal surgery. Any unexpected variation in the anatomical organization of its main blood vessels can obstruct the work of the inexperienced surgeon. During routine anatomical dissection of 65-year old female cadaver we discovered a complex variation of *truncus celiacus*.

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There are six types of celiacomesenteric arterial anatomy:

**Type 1** (Fig. 1): "Normal" anatomy (the most common variant) - *arteria hepatica communis* arising from the celiac axis to form *arteria gastroduodenalis* and *arteria hepatica propria* which is divided distally into *arteria hepatica dextra et sinistra*.

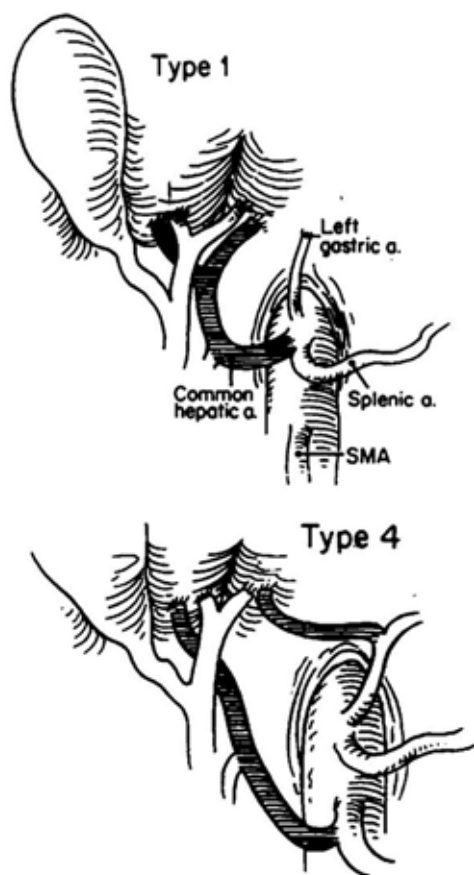


Fig. 1. Types 1 and 4 of celiacomesenteric arterial anatomy. Scheme [1]

**Type 2 and 2'**: Replaced or accessory *arteria hepatica sinistra* arising from *arteria gastrica sinistra*.

**Type 3 and 3'**: Replaced or accessory *arteria hepatica dextra* originating from *arteria mesenterica superior*.

**Type 4** (Fig. 1): *Arteria hepatica dextra* arising from *arteria mesenterica superior* and *arteria hepatica sinistra* arising from *arteria gastrica sinistra*.

**Type 5**: The entire *arteria hepatica communis* arising as branch of *arteria mesenterica superior*.

**Type 6**: *Arteria hepatica communis* originating directly from the *aorta*.

## FINDINGS

In the described case *truncus celiacus* (1) divides after a short course into *a. gastrica sinistra* (3), *a. lienalis* and *a. gastroduodenalis* (5). The missing *a. hepatica sinistra* (4) is replaced by a branch of *a. gastrica sinistra* (3), *a. hepatica dextra* (6) on the other hand streams from *a. mesenterica superior* (2) (Fig. 2).

*A. hepatica sinistra* (4) passes between the two sheets of *ligamentum hepatogastricum*, in its superior third and reaches *porta hepatis* via *sulcus ligamenti venosi*.

*A. hepatica dextra* (6) is separated from *a. mesenterica superior* (2) just under the *incisura pancreatica* and crosses behind *vena mesenterica superior*. It continues in the free margin of *ligamentum hepatoduodenale*, posteriorly to the *ductus choledochus* (8) and to the right of *vena portae* (7). Upon entrance in *ligamentum hepatoduodenale* the artery separates *a. pancreaticoduodenalis superior posterior*. *A. gastroduodenalis* (5) has a similar anatomical course to the course of the "normal" *a. hepatica communis* in the base of *ligamentum hepatoduodenale*.

The variation which we found during our work corresponds to Type 4 from the previously described classification and can be encountered in about 2,3% of the population.

## CONCLUSIONS

Knowledge of hepatic arterial vascularization has a significant impact on the daily practice of a wide range of practitioners including surgeons, specialized in the hepato-biliary-pancreatic area, general surgeons, radiologists (mainly those who are dedicated to interventional radiologic treatments) etc. The variations of the *truncus celiacus* and the hepatic arteries are of great importance for the classical and minimum invasive surgical approach to the liver, gallbladder and *ligamentum hepatoduodenale* (cholecistectomy, tumor resection of liver, pancreas head or duodenum, acquisition of donor material for liver transplantation). The knowledge of the

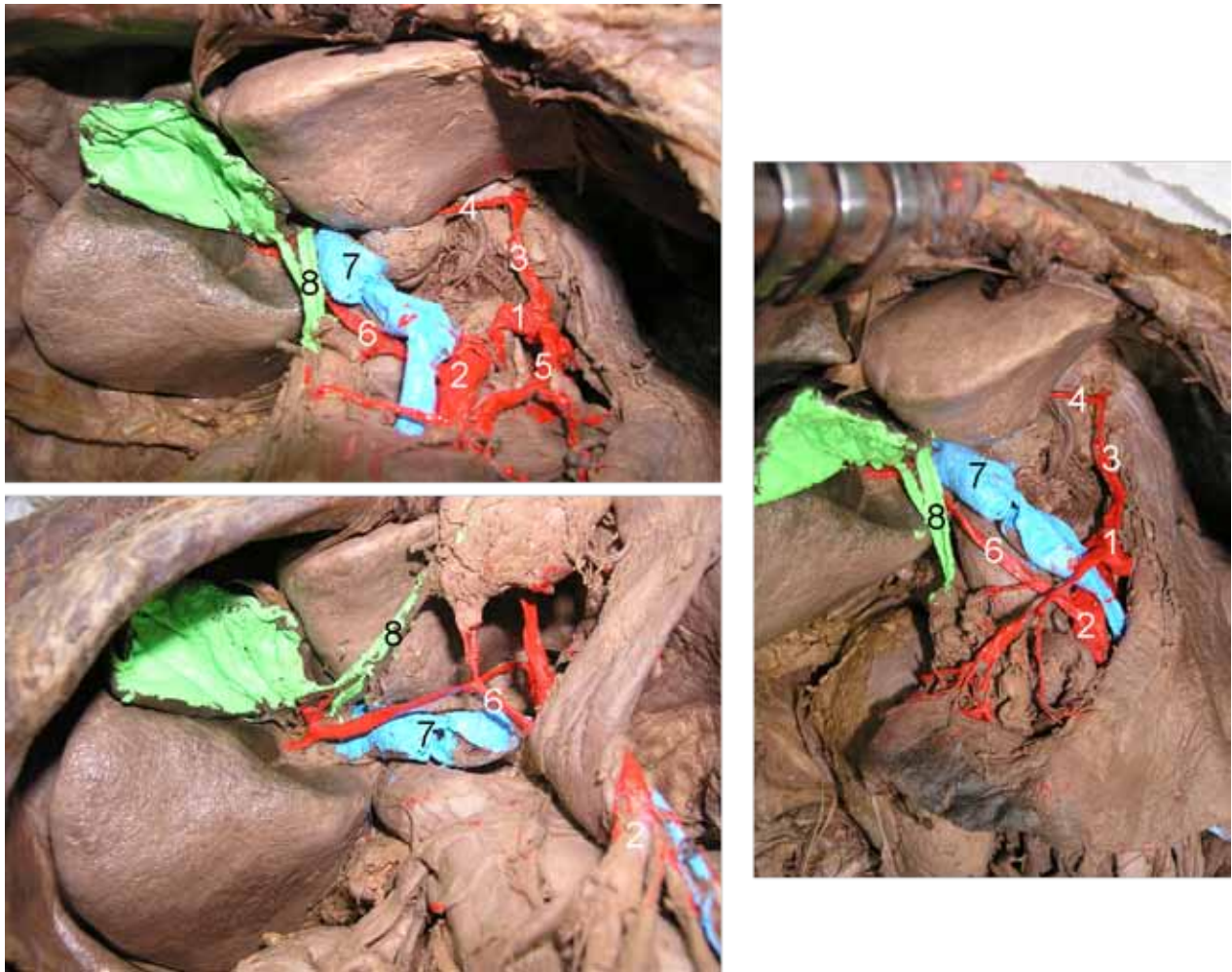


Fig. 2. Findings. Explanations in text

possible deviations in the hepatic arterial tree is also significant for the interpretation of hepatic anatomy based on imaging data received by means of hepatic angiography, 3d computed tomography, CT angiography etc.

## REFERENCES

1. Bergmann, R. A., A. K. Afifi, R. Miyauchi. Illustrated Encyclopedia of Human Anatomic Variation : Opus II: Cardiovascular System: Arteries: Abdomen: Variations in Branches of Celiac Trunk. Hepatic Artery. Anatomy Atlases [Internet]. [date unknown];[cited 2013 Feb 22] Available from: <http://www.anatomyatlases.org/AnatomicVariants/AnatomyHP.shtml>
2. Hiatt, J. R., J. Gabbay, R. W. Busuttill. Surgical anatomy of the hepatic arteries in 1000 cases.- *Ann. Surg.*, **220**, 1994, No 1, 50–52.