

## EARLY MORPHOGENESIS OF THE UMBILICAL VEIN

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**Introduction.** Venous blood flow in the liver is unique because it is provided by two embryonic and functionally different systems: the umbilical and portal hepatic or yolk systems.

The largest tributary vessel of the liver in prefetuses is the umbilical vein (UV), which passes through the gap of the round ligament of the liver and gives from 2 to 5 branches to the left side of the liver and the same number to the square. At the level of the left edge of the transverse sulcus, the UV is divided into three terminal branches: the posterior branch to the left lobe, the venous (Arantian) duct, and the anastomotic branch, through which the PV connects to the portal hepatic vein (PHV) [1-4].

**Main part.** At the beginning of the prefetal period of development (7th week), the liver occupies the cranioventral and middle sections of the abdominal cavity. Its transverse size is 4.8 mm (prefetus 19.8 mm parieto-coccygeal length (PCL)) and 5.1 mm (prefetus 20.0 mm PCL).

At present, under the influence of correlative processes caused by the development of organs and structures adjacent to the liver, in particular the duodenum, stomach, pancreas, ventral and dorsal mesogastria, the formation of the hepatoduodenal ligament occurs in the formation of square and caudate particles. and right sagittal and transverse [5]. The latter is the gate of the liver. Since that time, the liver acquires a typical external structure.

UV of prefetuses of the 7th week of development (14.0-20.0 mm PCL) was studied on 16 series of histological sections. It enters the liver in the region of the anterior edge of the left sagittal groove and is covered from below by the liver tissue. Along the way, it gives off 2-3 left lateral branches 40-50  $\mu\text{m}$  in diameter, branching in the left lobe of the organ, and 1-2 right ones, entering the square lobe [6-8].

At the level of the transverse sulcus, the UV is divided into two terminal branches - the venous strait and the portal sinus (the right terminal branch of the umbilical vein).

The outer diameter of the UV, at the site of its entry into the liver, is  $118.0 \pm 17.2 \mu\text{m}$  (6-week-old prefetuses), which increases to  $152.0 \pm 7.9 \mu\text{m}$  during the 7th week [9].

The diameter of the PHV during the 7th week of development increases from  $210.0 \pm 22.8 \mu\text{m}$  (6-week pre-fetuses) to  $311.0 \pm 17.2 \mu\text{m}$  (7-week pre-fetuses).

Having entered the liver tissue in the area of its gate, the PHV immediately divides into two large branches - the right and left. The latter is short, directed to the left and, within the transverse groove of the liver, connects with the portal sinus (one of the terminal branches of the umbilical vein), forming its right side, the outer diameter of the portal sinus reaches  $182.0 \mu\text{m}$  (the prefetus is 19.8 mm PCL).

The hepatic part of the UV is located in the anterior part of the left sagittal groove between the left and square particles of the liver. In more than half of the cases (14 out of 21), the sulcus is covered from below with hepatic tissue, which overturns in the form of a bridge between the square and left particles of the organ [10].

UV as a sheath is surrounded by fibrous connective tissue, which is also common for the branches of the hepatic artery and bile ducts, which makes it more difficult to prepare its walls.

**Conclusions.** Thus, already at the end of the prefetal period of development, the intrahepatic topography of the afferent venous vessels (umbilical and portal hepatic veins) and their branches of 1-2 orders acquires individual features of the definitive structure. The hepatic part of the UV runs in the anterior part of the left sagittal groove.

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