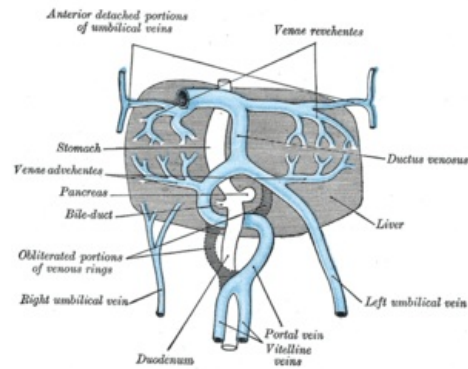


Development of veins



Embryo veins around 24-25. day.

In the fifth week, we already distinguish 3 pairs of large veins:

- **vv. omphalomesentericae** (*vv. vitellinae*) – bring blood from the yolk sac to the *sinus venosus*;
- **vv. umbilicales** – begin in the chorionic villi of the placenta and bring oxygenated blood to the embryo;
- **vv. cardinales** – drain blood from the body of the embryo.

Venae omphalomesentericae

Before entering the *sinus venosus* it forms *vv. omphalomesentericae* weave **around the duodenum** and pass around the *septum transversum*. The course of these veins is interrupted by the bases of the liver tissue, which grow into the *septum transversum*. This creates an extensive vascular plexus – **liver sinusoids**.

The left corner of the *sinus venosus* is reduced and the blood from the left part of the liver is thus diverted to the right. The result is a widening of the right *v. omphalomesenterica*. The latter finally forms the hepatic segment of the *inferior vena cava*.

From the right *omphalomesenteric vein* comes the *superior mesenteric vein*, which drains blood from the primary intestinal loop.

The proximal and distal parts of the left *omphalomesenteric vein* disappear.

The network of anastomoses around the duodenum forms one vein – *vena portae*.

Venae umbilicales

Vv. umbilicales first pass in pairs on both sides of the liver and partially connect to the hepatic sinusoids. The proximal part of both and the distal part of the right umbilical vein disappear. Finally, the embryo is supplied with oxygen from the placenta only by the left *umbilical vein*.

With increasing placental circulation, a direct **connection is formed between the left umbilical vein** and the right **omphalomesenteric vein – ductus venosus**. In this way, the excess blood bypasses the liver sinusoids.

After childbirth, both veins obliterate and **lig. teres hepatis** (*left umbilical vein*) and **lig. venosum** (*ductus venosus*) are formed.

Venae cardinales

Vv. cardinales presents **the main system by which venous blood is drained from the embryo**. From the head part of the embryo *vv. cardinales anteriores*, drain blood, from other parts of *vv. cardinales posteriores*. Both systems join before entering the *sinus venosus* and form a short *vv. cardinales communes*.

During the fourth week *vv. cardinales* create a symmetrical system. From the fifth to the seventh week, additional veins are formed:

- *vv. subcardinales* – drain blood mainly from the kidneys;
- *vv. sacrocardinales* – bring blood from the lower limbs;
- *vv. supracardinales* – collect blood from the body wall via *vv. intercostales* and gradually take over the function of *vv. cardinales posteriores*.

The formation of anastomoses between the right and left sides characterizes **the information of the inferior v. cava system**.

- Anastomosis between *vv. cardinales anteriores* transforms into the left *v. brachiocephalica*.
- Anastomosis between *vv. subcardinales* forms the left *v. renalis*. The right *vena subcardinalis* becomes the main draining trunk and transforms into the renal segment of the *inferior vena cava*.
- Anastomosis between *vv. sacrocardinales* form the left *v. iliaca communis*. The right *v. sacrocardinalis* forms the sacrocardinal segment of the *v. cava inferior*.

Links

Related articles

- Fetal circulation
- Development of the foundations of the vascular system, development of hematopoiesis, primitive blood circulation

References

- SADLER, Thomas, W. *Langman's Medical Embryology*. 1st Czech edition edition. Grada, 2011. 414 pp. pp. 217. ISBN 978-80-247-2640-3.