Proceedings of International Scientific Conference on Multidisciplinary Studies
Hosted online from Moscow, Russia
Date: 11th December, 2023
ISSN: 2835-5733 **Website:** econferenceseries.com

CLINICAL ANATOMY OF THE LIVER

Boborahimov Valisher Odilovich
3rd year student of Tashkent State Institute of Dentistry
Scientific supervisor: Gadayev AM, TDSI

Anatomical characteristics

The liver (Latin, ancient Greek – hepar) is not an integral part of the gastrointestinal tract (gastrointestinal tract), but is part of the digestive system. In addition to digesting food, the liver performs other vital functions.

In our body, the liver is the largest gland. Its weight in an adult is 1300-1800 g. The liver is located in the upper abdominal cavity. Most of the organ is located to the right of the median vertical axis of the body. And only a small fragment goes to the left of it.

There are two surfaces in the liver - the upper convex, diaphragmatic, and the lower concave, visceral. On the visceral surface there are two longitudinal and one transverse grooves in the shape of the letter H. These grooves divide the organ into two main lobes - the larger right one and the smaller left one. There are two more small lobes - quadrate and caudate.

Adjacent to the liver on the visceral surface are: the gallbladder, a section of the inferior vena cava, the right kidney with the adrenal gland, the right or hepatic flexure of the colon. The so-called gate of the liver, which includes:

- Branches of the hepatic artery;
- Branches of the portal vein. Collecting blood from the stomach, intestines, spleen;
- Right and left bile ducts;
- Lymphatic vessels.

The liver as a glandular organ consists of stroma and parenchyma. **The stroma** is the supporting protective framework of the liver. It is represented by a connective tissue capsule that covers the organ like a case. Connective tissue septa extend from the capsule into the thickness of the liver, dividing it into parts.

The liver is a large parenchymal organ of a wedge-shaped or triangular-flattened shape. It has two surfaces: the upper, or diaphragmatic, and the lower, or visceral. The liver is divided into right, left, quadrate and caudate lobes.

Liver topography

Tolotopia . The liver is located in the right hypochondrium, partly in the epigastrium and partly in the left hypochondrium.

Skeletotopia . The upper border of the projection of the liver onto the abdominal wall corresponds to the height of the dome of the diaphragm on the right, while the lower border is extremely individual and can correspond to the edge of the costal arch or be higher or lower.

Syntopy . The diaphragmatic surface of the liver is closely adjacent to the diaphragm, through which it comes into contact with the right lung and partially with the heart. The junction of the diaphragmatic surface of the liver with the visceral surface at the back is called the posterior edge. It is devoid of peritoneal covering, which allows us to talk about the non-peritoneal surface of the liver, or pars nuda . In this area, the aorta and especially the inferior vena cava are closely adjacent to the liver, which is sometimes immersed in the parenchyma of the organ. The visceral surface of the liver has a number of grooves and depressions, or depressions, the location of which is extremely individual and is laid down in embryogenesis; the grooves are formed by passing vascular and ductal formations, and the depressions are formed by underlying organs that press the liver upward. There are right and left longitudinal grooves and a transverse groove. The right longitudinal groove contains the gallbladder and the inferior vena cava, the left longitudinal groove contains the round and venous ligaments of the liver, the transverse groove is called the porta hepatis and is the site of penetration into the organ of the branches of the portal vein, the proper hepatic artery and the exit of the hepatic ducts (right and left). On the left lobe you can find impressions from the stomach and esophagus, on the right - from the duodenum, stomach, colon and right kidney with the adrenal gland.

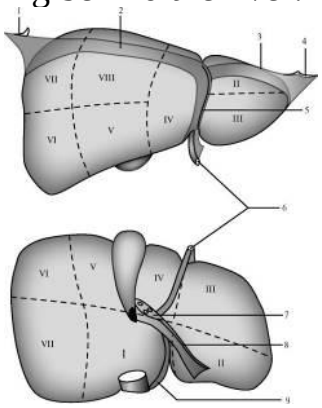
The ligamentous apparatus is represented by the places of transition of the peritoneum from the liver to other organs and anatomical formations. On the diaphragmatic surface, the hepatophrenic ligament is distinguished, consisting of longitudinal (falciform ligament) and transverse (coronary ligament with right and left triangular ligaments) parts. This ligament is one of the main elements of liver fixation. On the visceral surface are the hepatoduodenal and hepatogastric ligaments, which are duplications of the peritoneum with vessels, nerve plexuses and fiber located inside. These two ligaments, along with the gastrophrenic ligament, make up the lesser omentum.

Blood supply and venous drainage

Blood enters the liver through two vessels - the portal vein and the proper hepatic artery. The portal vein is formed by the union of the superior and inferior mesenteric veins with the splenic vein. As a result, the portal vein carries blood from the unpaired organs of the abdominal cavity - the small and large intestines, stomach, and spleen. The proper hepatic artery is one of the terminal branches of the common hepatic artery (the first branch of the celiac trunk). The portal vein and the proper hepatic artery are located in the thickness of the hepatoduodenal ligament, while the vein occupies an intermediate position between the trunk of the artery and the common bile duct.

Not far from the gate of the liver, these vessels are each divided into their two terminal branches - right and left, which penetrate the liver and are divided into smaller branches. The bile ducts are located parallel to the vessels in the liver parenchyma. The proximity and parallelism of these vessels and ducts made it possible to distinguish them into a functional group, the so-called Glissonian triad, the branches of which ensure the functioning of a strictly defined section of the liver parenchyma, isolated from others, called a segment. A liver segment is a section of the liver parenchyma in which the segmental branch of the portal vein branches, as well as the corresponding branch of the proper hepatic artery and the segmental bile duct. Currently, the division of the liver according to Couinaud is accepted , according to which 8 segments are distinguished (Fig. 1).

Venous outflow from the liver is carried out through the system of hepatic veins, the course of which does not correspond to the location of the elements of the Glissonian triad. Features of the hepatic veins are the absence of valves and a strong connection with the connective tissue stroma of the organ, as a result of which these veins do not collapse when damaged. In the amount of 2-5, these veins open at their mouths into the inferior vena cava passing behind the liver.



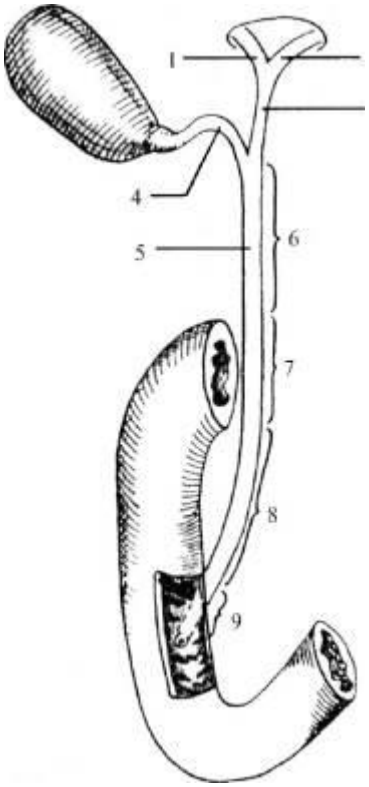
Rice. 1. Ligaments and segments of the liver: 1 - right triangular ligament; 2 - right coronary ligament; 3 - left coronary ligament; 4 - triangular ligament; 5 - falciform ligament; 6 - round ligament of the liver; 7 - gate of the liver; 8 - hepatoduodenal ligament; 9 - venous ligament. I-VIII - liver segments

Topography of the gallbladder

The gallbladder is a hollow muscular organ, which is divided into a fundus, a body and a neck, through which the bladder is connected through the cystic duct to the rest of the components of the biliary tract.

Tolotopia . The gallbladder is located in the right hypochondrium.

Skeletotopia . The projection of the bottom of the gallbladder corresponds to the point of intersection of the costal arch and the outer edge of the rectus abdominis muscle.



Rice. 2. Extrahepatic bile ducts: 1 - right hepatic duct ; 2 - left hepatic duct; 3 - common hepatic duct; 4 - cystic duct; 5 - common bile duct; 6 - supraduodenal part of the common bile duct; 7 - retroduodenal part of the common bile duct; 8 - pancreatic part of the common bile duct; 9 - intramural part of the common bile duct

Syntopy . The upper wall of the gallbladder is closely adjacent to the visceral surface of the liver, in which a vesical fossa of appropriate size is formed. Sometimes the gallbladder appears to be embedded in the parenchyma. Much more often, the lower wall of the gallbladder comes into contact with the transverse colon (sometimes with the duodenum and stomach).

The blood supply to the gallbladder is provided by the cystic artery, which is usually a branch of the right hepatic artery. Considering that its course is very variable, in practice, Callot's triangle is used to detect the cystic artery . The walls of this triangle

are the cystic duct, the common bile duct and the cystic artery. Blood from the bladder flows through the cystic vein into the right branch of the portal vein.

Topography of the bile ducts

Bile ducts are hollow tubular organs that transport bile from the liver to the duodenum. Directly at the porta hepatis are located the right and left hepatic ducts, which merge to form the common hepatic duct. Merging with the cystic duct, the latter forms the common bile duct, which, located in the thickness of the hepatoduodenal ligament, opens into the lumen of the duodenum with a major papilla. Topographically, the following parts of the common bile duct are distinguished (Fig. 2): supraduodenal (the duct is located in the hepatoduodenal ligament, occupying the extreme right position in relation to the portal vein and hepatic artery), retroduodenal (the duct is located behind the upper horizontal part of the duodenum), pancreatic (the duct is located behind the head of the pancreas, sometimes it appears to be embedded in the parenchyma of the pancreas) and intramural (the duct passes through the wall of the duodenum and opens in the papilla). In the last part, the common bile duct usually connects with the common pancreatic duct.

References

1. Couinaud C. Anatomic principles of left and right regulated hepatectomy: technics. J Chir. 1954;70(12):933.
2. Lau WY, et al. Chapter 2. Liver segments. In: Lau WY, editor. Applied anatomy in liver resection and liver transplantation. Beijing: People's Medical Publishing House; 2011. p. 7–21.
3. Healy JE Jr, Schroy PC. Anatomy of the biliary ducts within the human liver: analysis of the prevailing pattern of branchings and the major variations of the biliary ducts. Arch Surg. 1953;66(5):599.
4. Strasberg SM. Nomenclature of hepatic anatomy and resections: a review of the Brisbane 2000 system. J Hepatobiliary Pancreat Surg. 2005;12(5):351–5.
5. Terminology committee of the IHPBA. The Brisbane 2000 terminology of liver anatomy and resections. HPB (Oxford). 2000;2:333–9.
6. Couinaud C. Surgical anatomy of the liver revisited. Paris: Self-printed; 1989.
7. Yamamoto M, Katagiri S, Ariizumi S, Kotera Y, Takahashi Y, Egawa H. Tips for anatomical hepatectomy for hepatocellular carcinoma by the Glissonean pedicle approach (with videos). J Hepatobiliary Pancreat Sci. 2014;21(8):E53–6.

8. Launois B, Tay KH. Intrahepatic glissonian approach. In: Lau WY, editor. Hepatocellular carcinoma. Singapore: World Scientific Publishing; 2008. p. 429–46.
9. Lau WY, et al. Chapter 6. Hepatic hilar plate system. In: Lau WY, editor. Applied anatomy in liver resection and liver transplantation. Beijing: People's Medical Publishing House; 2011. p. 31–40.
10. Iqbal S, Iqbal R, Iqbal F. Surgical implications of portal vein variations and liver segmentations: a recent update. J Clin Diagn Res. 2017;11(2):AE01–5.
11. Dina C, Bordei P, Beşleagă A, Bordei L. Aspects de la vascularisation segmentaire veineuse du foie. Morphologie. 2005;89(287):176.