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MORPHOLOGICAL STRUCTURE OF THE HEPATIC-PANCREATIC AMPULLA OF RABBITS

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Abstract. Gastrohepatoduodenal system is the most complex in structure and important in functional significance department of the digestive tract. It is here that the secretion of the main digestive juices into the intestinal cavity takes place, and this process is strictly coordinated and depends on the ingestion of chyme into the intestinal cavity. Consequently, the secretion of bile and pancreatic juice into the intestine depends on the digestive activity of the duodenum. The production of bile by the liver is a continuous process, and when there is no need of bile in the body, it accumulates in the gall bladder and is secreted into the duodenum at the time of digestion.

Keywords. Cholecystectomy, short and long cystic duct stump, disruption of innervation connections.

Аннотация. Гастрогепатодуоденальная система - самый сложный по строению и важный по функциональному значению отдел пищеварительного тракта. Именно здесь происходит выделение основных пищеварительных соков в полость кишечника, причем этот процесс строго скоординирован и зависит от поступления химуса в полость кишечника. Следовательно, выделение желчи и панкреатического сока в кишечник зависит от пищеварительной активности двенадцатиперстной кишки. Выработка желчи печенью является непрерывным процессом, и когда в организме нет потребности в желчи, она накапливается в желчном пузыре и выделяется в двенадцатиперстную кишку в момент пищеварения.

Ключевые слова. Холецистэктомия, короткая и длинная культя кистозного протока, нарушение иннервационных связей.

Anatomical and histological structure of the gallbladder and bile ducts is devoted to a considerable number of scientific researches (Anoshina A.A., 1972; Kuzin M.I. et

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al., 1983; Mehler S.1. et al.; 2004, Dehkanov T.D. et al. 2007). There is a large arsenal of scientific works on surgical anatomy and methods of surgical treatment of gallbladder and biliary tract diseases. A part of researches is devoted to the problem of postcholecystectomy syndrome, its clinic and morphology (Lidsky A.T., 1962; Zarzar A.S., 1967; Gorshkova S.M., Kurtsin I.T., 1967; Ishutinov V.D., 1969; Sitenko V.M., Nichet A.I., 1972; Edemsky A.I., Svishchov A.V., 1986; Kakabadze Z.B. et al., 2003). According to different authors, postcholecystectomy syndrome is observed in 3 - 30% of cases after gallbladder removal (Shchitov V.S., 1967). When studying this problem, a number of questions arise, in particular, what is innervated by the gallbladder, what is connected with the appearance of postcholecystectomy syndrome. In clinical literature there is a lot of data on combined diseases of the gallbladder and its neighbouring organs (cholecystitischolangitis, hepatocholecystitis, cholecystoduodenitis, cholecystopancreatitis) and data on the appearance of functional and pathological disorders in the presence of pathological changes in one of these organs.

Purpose of the study. To study the morphology of the intramural apparatus of extrahepatic bile ducts.

Materials and methods of research. Organ complexes of 30 laboratory animals served as a material for the study. Of them rabbits 19 males, 11 females, weighing from 2 to 2,5 kg. The organs of the hepatocholedocho-dochoduodenopancreatic zone of rabbits were taken immediately after the animal slaughter and fixed in 12% neutral formalin solution. After 10-15 days the preparations were washed for 24 hours with water. The macrotopography of extrahepatic bile ducts from the liver gate to the place of their confluence with duodenum was studied by the method of anatomical dissection under a binocular microscope. The fixed material was studied by the method of anatomical dissection using a special dissecting needle. Macromorphology, variants of topography and macromorphometric parameters of extrahepatic bile ducts were studied, namely, length, diameter of ducts using an ocular ruler. The variants of ducts fusion, interrelation of bile ducts with portal vein and hepatic artery and their relations to peritoneum were determined. Statistical processing of the obtained digital data was carried out by the method of mean values with determination of the mean arithmetic mean error. To characterise the mean variation, we used exclusively the mean square deviation of sigma rather than the simple mean deviation. The mean error of the

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arithmetic mean was determined by the formula m=. The material was processed statistically using the formulas given in the monograph by E. Förster and B. Renz (1983). To study the histological structure of the walls of extrahepatic bile ducts and histotopography of their layers, we used organocomplexes of the rabbit hepatocholedochodochoduodenopancreatic system. The slices prepared in the traditional way were cast in liquid paraffin and glued on numbered blocks. Sections were obtained on a rail microtome, 8-10 microns thick. They were stained with haematoxylin and eosin to study the histological picture. To study collagen fibres, the preparations were stained with Van Gieson's picrofuchsin. Microscopic study of the preparations was performed under the stereoscopic attachment (AU-12) of the C-13 Biolam microscope. Thickness of layers of membranes, epithelium and other structural components was measured by ocular micrometer of microscope. For impregnation of nerve elements of extrahepatic bile ducts and gallbladder we used the method of Bilshovsky-Gross, Campos. We used the method of determination of typological belonging of cells of vegetative ganglia stained by the weasel method. The material was taken immediately after slaughter of the animal and fixed in 12% neutral formalin solution. The gall bladder in rabbits and bile ducts were opened and spread on foam plastic, the edges were fixed with hedgehog needles. The material spread in this way was fixed for 1-2 hours, then it was transferred to a glass jar and suspended in fresh 12% solution of neutral formalin. The reaction of formalin was periodically checked with the universal indicator RKS, impregnation of the material was started when the pH of formalin shifted to the acidic side. Cholecystectomy was performed on 10 rabbits under anaesthesia with 2% xylazine solution, the way from the bottom to the neck of the bladder. Morphometric studies were carried out 10 and 30 days after the operation.

Study Results. The hepatic-pancreatic ampulla is a complex section of the digestive canal, where the common bile duct and the pancreatic duct open. There are contradictory data regarding the functional significance and connections of its muscular sheath with that of the duodenum. There are different points of view about the internal microrelief of this ampulla, the clarification of which has not only important theoretical, but also significant practical value. If we take into account the presence of morphological features of the duodenocholedochopancreatic zone organs in animals with different feeding patterns, the study of the comparative morphology of the hepatic-

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pancreatic ampulla in various representatives of vertebrates with different feeding patterns is an urgent issue.

Morphological data of the hepatic-pancreatic ampulla of six adult almost healthy rabbits are included in this article. The duodenal wall flap with hepatic-pancreatic ampulla was frozen in cryostat and serial histotopographic Freshes were stained by hematoxylin-eosin and Van Gieson method. The hepatic-pancreatic ampulla of rabbits is located in the thickness of the longitudinal fold of the duodenal mucosa and has mucosa, submucosa and muscle. In the area of the longitudinal fold it has the largest diameter. The mucous membrane of the hepatic-pancreatic ampulla forms numerous anastomosing folds (flaps), which with their tops are directed towards its mouth, where they close and thus prevent retrograde flow of duodenal contents into the ampulla. The flaps from both surfaces are covered with single-layer prismatic epithelium, and their stroma is formed by loose unformed connective tissue. Analysis of serial preparations showed that the muscular sheath of the hepatic-pancreatic ampulla is a part of such a sheath of the duodenum.

Thus, the hepatic-pancreatic ampulla of rabbits has a complex system of valve-sphincter complex. reliably protecting it from regurgitation of duodenal contents, and its muscular sheath is organically connected with such duodenal sheath.

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