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Research Article

MODE OF FORMATION AND TOPOGRAPHY OF THE HEPATIC-PANCREATIC AMPULLA MUCOSA

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ABSTRACT

Serial histotopographic sections of the greater duodenal papilla area have been studied to clarify the way of formation of the hepatic-pancreatic ampulla and the intramural part of the common bile and pancreatic ducts. In predominant cases in the longitudinal fold of the duodenum the common bile and pancreatic ducts are fused and form a common hepatic-pancreatic ampulla, which opens with an orifice at the apex of the large papilla of the duodenum (papilla fatera). The shape of the ampulla cavity depends on the level of fusion of the aforementioned ducts.

KEYWORDS

Hepatic-pancreatic ampulla, mode of formation, morphology.

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INTRODUCTION

The hepatic-pancreatic ampulla is the most complex and important part of the digestive tract in general and the duodenum in particular. According to researchers, it is a natural accumulator, mixer and dispenser of bile and pancreatic secretion which are released into the duodenal cavity according to its periodic digestive activity. Moreover, nowadays due to the steady growth of biliary diseases and intensive development of endoscopic technique many therapeutic and diagnostic endoscopic manipulations are performed, and often by retrograde insertion of endoscopic probes through the ampullary orifices. However, the complication rate of these manipulations remains high. It is also not uncommon for gallstones to get stuck in this ampulla (embedded stones) creating a "biliary colic" syndrome. It seems to be due to these circumstances that questions of the structure of the greater duodenal papilla and its ampulla have attracted the attention of morphologists even in the present century.

Purpose of the study: To study intramural morphology of the duodenum longitudinal fold, mode of formation and relief of the hepatic-pancreatic ampulla mucosa in dogs and humans.

MATERIAL AND METHODS OF THE RESEARCH

The material for our study was a flap of the duodenum wall of 12 adult dogs containing its longitudinal fold which was cut from the level of the common bile and pancreatic ducts entry to the lower border of the mouth opening of the ampulla fatera papilla, and also histotopographic micro preparations (from scientific archive of the department) of the above mentioned area of 5 adult humans. The material was stretched on a plate of paraffin, fixing the edges with wooden needles and fixed in 12% neutral formalin. Formalin was neutralized with a saturated solution of sodium tetra-boronate. The material was processed and embedded in paraffin according to conventional methods. All material was "planted" in one block and consecutive histotopographic sections were stained with 56 hematoxylin-eosin, Van Gizon and Mallory methods. The weight of the block was cut and the intramural portion of the ducts and ampulla of the

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phaternomastoid papilla were studied sequentially throughout. Photocopies of histotopographic preparations were prepared in several cases by printing directly from the preparation through a photographic enlarger according to the method of A.I. Brusilovsky

RESULTS OF THE STUDY

In dogs the common bile duct is fused with the common bile duct in the thickness of the longitudinal fold. Both ducts first attach and gradually sink into the wall of the duodenum. In the proximal part the cavity of the ducts is divided by a septum consisting of their wall. As the ducts are submerged, this septum gradually thins and disappears so that the ducts merge to form a common dilatation called the faternal papilla (hepatic-pancreatic ampulla).

The level of fusion of the ducts is variable and the shape of the ampulla depends to some extent on this. Most often the fusion of the ducts occurs in the middle part of the longitudinal fold and in these cases the shape of the ampulla is oval with its long axis parallel to that of the longitudinal fold. The distal part of the ampulla forms its orifice, which is located at the apex of the great papilla of the duodenum. The mucosa of the ampulla forms many high folds of varying configuration and length, which protrude into the cavity of the ampulla. In the proximal part of the ampulla the folds are mostly longitudinal and hardly any anastomoses.

As the diameter of the ampulla expands, the folds become varied in construction as well as in length and anastomoses appear between them. Transverse sections of the ampulla show a complex set of folds, at the base of which a slice of multiple tubules covered with prismatic epithelium can be seen. A cross section also shows a slice of isolated folds not connected to the surrounding tissue. These appear to be slices of the mobile parts of the folds deeply embedded in the ampullary cavity. The mucosa of the ampulla of the phaterngeal papilla also forms many folds of varying shape and length. In contrast to that of laboratory animals, the folds are massive at the base and have more tubules (Figure 1). In the distal part, all the folds have a longitudinal orientation and the distal ends of the folds seem to clasp together at the mouth, closing the lumen of the ampulla mouth, apparently forming a locking device to prevent retrograde inflow of intestinal contents into the cavity of the ampulla.

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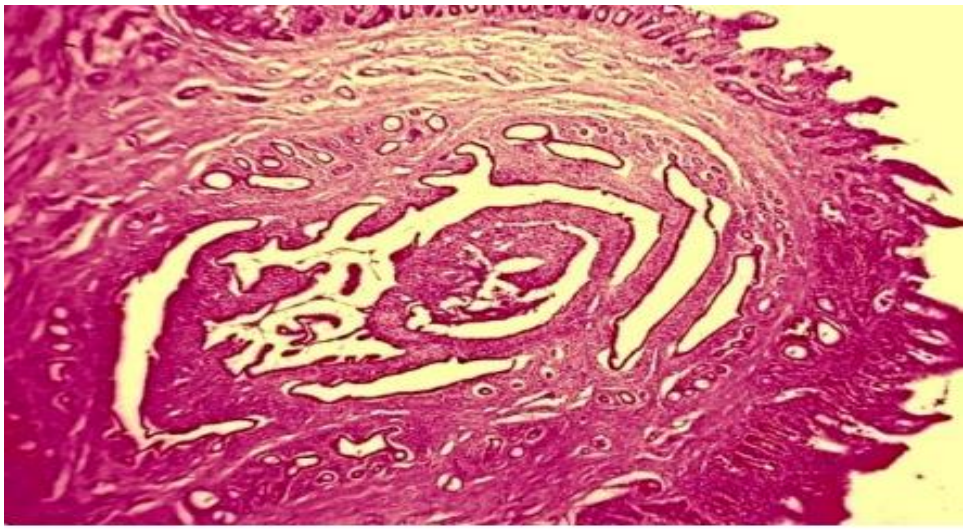

Figure 1. Transverse section of a human hepatic-pancreatic ampulla. Hematoxylin-eosin staining.Ob.20, approx.7.

CONCLUSIONS

Thus, in the thickness of the longitudinal fold of the duodenum an enlarged cavity is formed due to the fusion of the common bile duct and the pancreatic outlet duct, which is called the hepatic-pancreatic ampulla (ampulla of the papilla fatera). The mucosa of the ampulla forms many folds of varying size, height and configuration. They have anastomoses between them. Some folds form mobile ends located in the ampullary cavity. These ends of the distal folds close together at the mouth of the ampulla and form a locking device to prevent retrograde entry of the intestinal contents into the ampulla cavity.

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