



Morphological Substantiation of Colon Resection in Children

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In the surgical treatment of colon pathologies, the surgeon always strives to restore intestinal continuity. After the operation, a part of the large intestine loses its physiology, physiological curves and sphincters often disappear, leading to a violation of its function.

In order to study the morphological features of the structure of the colon, we conducted experimental studies on white laboratory rats.

To conduct an experimental scientific study, 58 white laboratory rats of both sexes, aged from birth to 9 months of age, were used. The material for microscopic examination was fresh samples of the colon of white laboratory rats, in the early postnatal period of life - on the 1st, 7th, 14th and 21st days of life, as well as in the late postnatal period of life - at the age of 1- th, 3rd, 6th and 9th months. Production, fixation and staining of the experimental histological material was carried out according to the generally accepted method.

The study of the obtained histological materials showed that the muscular membrane of the colon of white rats consists of two mutually perpendicularly directed smooth muscle fibers. The outer and inner layers, which consist of several mutually, parallel groups of smooth muscle fibers. These groups of muscle fibers are wrapped in a sheath consisting of loose-fibrous, elastic fibers, forming a connective tissue sheath. In some places, in the region of the sphincters, between the layers there are connective tissue fibers, originating from the adventitia and penetrating the muscular and sub mucosal layers, reaching its own. The muscular membrane of the colon in the area of the sphincters is significantly thickened, in some places they form vascular-connective collagen layers located between the sub mucosa and the muscular outer membranes. The directions of the layers are from inside to outside, from bottom to top. The longitudinal layer of the muscular membrane of the colon in white rats is not only the outer part of the muscular membrane, but at the same time is the outer border of the intestinal wall; outside it is covered with a thin layer of visceral peritoneum.

In postnatal ontogenesis in white rats, the collagen fibers of the colon in the sphincter area form the basis of the submucosal layer, while the bundles in the submucosal base are unevenly distributed, fan-shaped, and intertwined in places. The bundles of collagen fibers adjacent to the outer muscle layer change their direction in places and, being between the bundles of the outer longitudinal and inner circular muscle layers, separate the bundles of these muscle layers from each other. The bundles of collagen fibers lying closer to the integumentary epithelium are directed in different directions and do not have a specific orientation. At the base of large folds of the mucous membrane, part of the bundles of collagen fibers, intersecting with each other, form a network. Bundles of collagen fibers that lie at the base of large folds of the mucous membrane, bending, are directed to these folds, and the distribution density of bundles of collagen fibers is greater at the base than at the top of the folds. Around the vessels of the submucosa, bundles of collagen fibers are oriented circularly, evenly surrounding the vessels from all sides.



Thus, all layers of the walls of the colon in rats in postnatal ontogenesis in the area of the sphincter are shrouded in fibrous structures of connective tissue, consisting of bundles of collagen fibers. These collagen fibers form the structural basis of the colon walls in the sphincter area in rats and are most pronounced in the submucosal layer. In the bundles of the muscle layer, there are groups of unidirectional muscle fibers wrapped in a connective tissue, collagen case, which is the muscular basis of the sphincter. Bundles of collagen fibers intersecting with each other in all layers form a network, which is one of the structural foundations of the retaining, sphincter apparatus of the colon of albino rats.

In the area of sphincters, branches depart from the superficially located main vessels, each of which is divided into two girdle branches, directed oppositely to each other along the perimeter of the intestinal tube. On the opposite side of the mesentery, they anastomose with each other, smaller arterial vessels (arterioles) extend from them, penetrating into the depths of the muscular and submucosal layers. Between arterioles and venules there is a small circulatory capillary vascular network, they are branches of the corresponding arterial and venous vessels segmentally encircling the perimeter of the intestinal tube, which provides trophism of the layers of the intestinal wall in the sphincters.

Conclusion: When choosing the optimal level of colon resection, it is important to select the resection points as far as possible from the area from the localization of the colonic sphincters.

References

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