



atresia refers to the period of organogenesis at the 3-4th week of fetal development, when one of the processes of formation of the intestinal wall, intestinal lumen and intestinal rotation is disrupted.

The digestive tract in the process of development goes through stage, when the proliferation of the epithelium completely closes the intestinal lumen. The process of vacuolation ends with the restoration of the lumen of the intestinal tube, but under certain conditions the last phase is broken and the intestinal lumen remains closed. If the recanalization process is changed in a small area, and the intestinal lumen is closed by a thin membrane, then the membrane atresia occurs. In cases where the recanalization process has begun, and holes of different sizes are formed in the membrane, then membranous stenosis occurs. When closing the lumen for a long time atresia has the character of a fibrous cord.

So, the cause of this form of atresia may lie in the underdevelopment of the corresponding branch of the mesenteric vessel. Differentiation of intramural nodes continues in the postembryonic period, new neurons and a capsule around nodes are formed, the sizes of cells increase.

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### **DEVELOPMENT OF MAXILLARY SINUSES FOR 3-5 MONTHS OF THE FETAL PERIOD OF HUMAN ONTOGENESIS**

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The features of development and formation of topographic and anatomical relationships of the walls of the maxillary sinuses were studied on 29 biological objects during 3-5 months of fetal ontogenesis by means of morphological research methods (histological, graphic and plastic reconstruction, preparation, morphometry).

The development of maxillary sinuses during the 9th week of the fetal period (beginning of the 3rd month, prenatal 31.0-41.0 mm TCD) was studied on 8 series of histological preparations. It is established that at the beginning of the 3rd month of the intrauterine period of development due to the insertion of the mucous membrane of the middle nasal passage above the base of the lower nasal cavity into the adjacent mesenchyme, the rudiment of the maxillary sinus is formed. In the studied fetuses, the shape of the maxillary sinus approaches oval. Its anteroposterior size is  $0.3 \pm 0.2$  mm, transverse –  $0.02 \pm 0.05$  mm and vertical –  $0.06 \pm 0.02$  mm.

The development of these structures at the end of the 3rd month of development was studied on 6 prenatal subjects from 42.0 to 79.0 mm TCD. At this stage, the development of maxillary sinuses continues, their anteroposterior size increases to 1.1-1.3 mm, transverse – to 0.15-0.18 mm and vertical – 0.13-0.22 mm. Their shape, as in previous prenatal subjects remains oval.

The development of maxillary sinuses in fetuses of the 4th month (81.0-135.0 mm TCD) was studied at 7 sites. At the beginning of the fetal period of human development, the maxillary sinus on the frontal sections has an elongated oval shape, which connects with the nasal cavity through a slit-like opening located within the middle nasal passage. The lower wall of the sinus is 1.0 mm above the bottom of the nasal cavity. It is separated from the lower nasal passage by a layer of loose connective tissue 0.45-0.5 mm thick, from the middle – 0.5-0.65 mm, and from the orbit – 0.6-0.74 mm. At this stage, the process of forming the glands of the mucous membrane of the maxillary sinuses by inserting the epithelium into the subordinate mesenchyme. The height of the mucous membrane in these areas reaches 0.20-0.21 mm, and its thickness is  $0.2 \pm 0.3$  mm. These areas are located at the base of the lower nasal cavity.

After examining 8 drugs on the fetus of the 5th month of development (17-20 weeks, 136.0-185.0 mm TCD), we found that the maxillary sinus is located in the body of the upper jaw lateral to the base of the lower nasal cavity. There is an increase in the height of the sinuses and a relative decrease in the diameter of the natural hole. The lower wall of the sinus is located 1.0-1.4 mm above the bottom of the nasal cavity. It is separated from the lower nasal passage by a layer of connective tissue 0.5-0.55 mm thick, from the middle nasal passage - 0.7-0.75 mm, and from the orbit - 0.8-0.86 mm.



At the 5th month of fetal development, the variability of the shape of the right and left maxillary sinuses can be traced and they can be represented by the following types: spherical, oval and spherical-oval. The anteroposterior size of the right maxillary sinus is 2.0-2.2 mm, transverse – 0.18-0.21 mm, vertical – 0.25-0.3 mm, and the size of the left maxillary sinus, respectively, is equal to: 1.8-2,0 mm, 0.16-0.19 mm, 0.23-0.25 mm. It should be noted that the sinus is limited by the rigid skeleton of the upper jaw. At this stage of fetal development in the mucous membrane are clearly detected blood vessels and glands.

So, based on the study, it can be concluded that the rudiment of the maxillary sinus appears in the middle of the prenatal period of development. In the fetal period there is a further formation of the maxillary sinuses, there are changes mainly quantitative in nature (increasing the size of the maxillary sinuses), and this process continues in subsequent age periods of ontogenesis.

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### **VARIANT ANATOMY OF THE SIGMOID COLON AND SIGMOIDORECTAL SEGMENT IN THE THIRD TRIMESTER FETUSES**

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Topicality to study variant anatomy of the sigmoid colon and its sigmoid rectal segment is associated with an active use of this portion while performing reconstructive surgery followed by replacement of a part of the esophagus, urinary bladder, vagina and other organs (A.F.Makarov, 2009). The use of the distal portion of the large intestine as a functional part for transplantation in adults and children stipulates further investigation of its anatomy during the perinatal period of human ontogenesis.

Objective of the study was to investigate variant anatomy of the sigmoid colon and its sigmoid rectal segment in 7-9-month fetuses and determine macro- and microscopic structural peculiarities of the sigmoid rectal segment components in the third trimester fetuses.

The study was conducted on 31 dead 7-9-month fetuses (12 – males, 18 – females) with 305,0-420,0 mm of the parietocalcaneal length (PCL) by means of the following methods of morphological examination: somatoscopy, anthropometry, macro- and micro-dissection, morphometry, injection of the arterial vessels, histological and statistical. The shape of the sigmoid colon in the dynamics of the 3<sup>rd</sup> trimester is found to change. The specimens of a spiral shape (38,8 %) and zigzag shape (25,8%) of the sigmoid colon are found more commonly, but  $\Omega$ -shaped intestine and barleycorn shape were not found. Variability of anatomical shapes of the sigmoid colon is caused by uneven development of the colon portions and body type. Short C-shaped and U-shaped sigmoid colon is peculiar for the dolichomorphic type, and the brachiomorphic type is characterized by the long spiral and zigzag sigmoid colon. Accelerated lengthwise growth of the sigmoid colon and enlargement of the diameter of the sigmoid rectal segment components occur in the dynamics of the third trimester of the intrauterine development. The most probable correlation ( $r = 0,9$ ,  $p < 0,001$ ) is found between the diameter of the sigmoid rectal transition and the diameter of the peritoneal portion of the rectum. Macroscopic signs of the sigmoid rectal segment in 7-9-month fetuses are considered narrowing of the intestinal tube in the pint of transition of the sigmoid colon into the rectum; availability of the mucous semicircle fold located transversally to the colon axis on the level of transition of the sigmoid colon into the rectum. Histologically the mucous membrane of the sigmoid rectal transition in 7-month fetuses appears to be thicker than that of 8-9-month fetuses. Blood vessels of the plexus are found in the submucous base. Partial penetration of the loose fibrous connective tissue of the submucous base into the muscular layer of the initial part of the peritoneal portion of the rectum is observed. The thickness of the muscular layer of the sigmoid rectal segment in 7-month fetuses is more than a half of the intestinal wall, but during 8-9 months of development the mucous layer becomes thinner.

Thus, during the third trimester of gestation the shape of the sigmoid colon and its sigmoid rectal segment is characterized by individual variability due to accelerated lengthwise growth of the colon and enlargement of the diameter of the sigmoid rectal segment components. Short C-shaped