

# PRENATAL FORMATION OF LYMPH NODE SINUSES

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## Abstract

A progressive transformation of primordia is a common stage in the formation of lymph node sinuses regardless of their localization. A simultaneous formation of the regional reports from the sinus area of the gate through the slit-like rudiments of the intermediate sinuses seems to be the most probable combination.

**Keywords:** lymph nodes, formation, sinus, lymph node primordium, capsule, popliteal lymph node, pro-interstitial cortical.

## Introduction

### MATERIALS AND METHODS

Henri Policard optimistically considered the pace of development of theoretical and applied lymphology: "Despite the value and numerous the inadequacy of the latest research on structure and functions of the lymphoid system, it is all still continues to be one of the most nasty components of the body" [6, p. 199]. At the same time, Henri Policard optimistically considered the pace of development of theoretical and applied lymphology: "We can hope that in the near future years, the lymphoid system will become one of the most more studied objects both in pathophysiological and in general biological terms" [6, p. 200]. Od-however, despite numerous publications on functional and clinical anatomy of lymphatic logical system and its most important link – organs immunogenesis [1, 7, 11, 12], modern methodologies logical approaches and perfect methodological techniques for studying this functional system organism [2, 3], today scientific research bots in the field of lymphology, addressed to doctors -practices that would meet the needs clinical medicine, are rare [1, 4]. This explains insufficient development of theoretical principles new therapeutic lymphology [4, 9], ambiguous ideas about the fundamental facts of functional anatomy of the lymphatic system, including including the sources and mechanisms of its formation structures at the stages of ontogenesis, which is one of the least developed issues of embryology [9]. Conflicting ideas about the paths formation of the most important element of lymphatic which node (LU) is its drainage system [5,8].

### GOAL OF THE WORK

Get morphological facts for inter- interpretation of the patterns of sinus formation LN in prenatal ontogenesis. Tasks. 1. Study the morphological features ity of the sinuses of visceral and somatic lymph nodes on stages of organ formation in prenatal onto- genesis; 2. Identify general



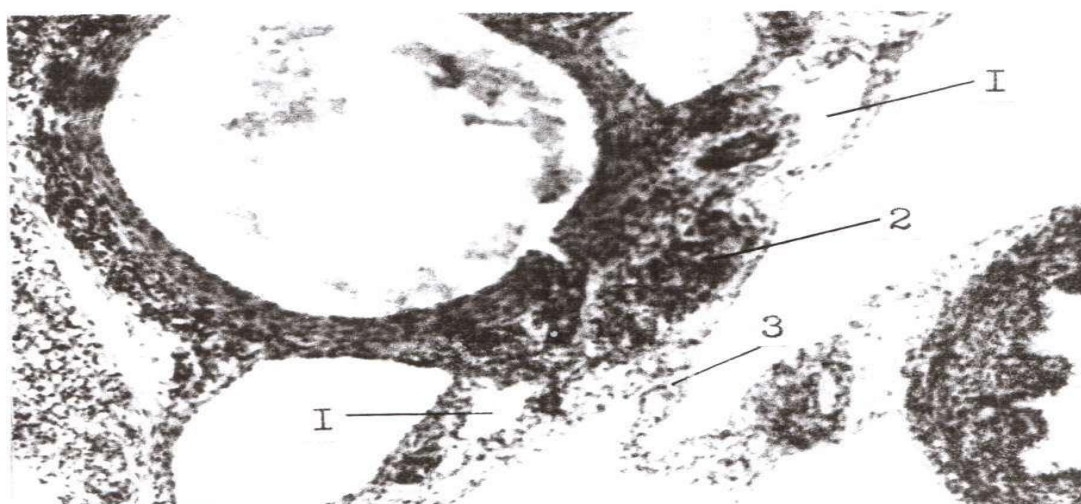
characteristics and special features the development of sinuses of lymph nodes of various localizations.

## 2. RESEARCH METHODOLOGY

The material for the work was visceral (mesenteric) and somatic (popliteal) lymph nodes of 24 chinchilla rabbits of two stages of ontogeny: 17th day of intrauterine development (prefertility) period - 11 animals) and the 23rd day of prenatal formation (fetal period - 13 animals). To fix the material, 10% formalin solution was used. When studying the rudiments of lymph nodes, serial total sections were prepared, through the body of animals perpendicular to the longitudinal axis and pelvic limb, perpendicular axis of the limb extended at the knee joint in the oblique area of the popliteal fossa. They gave a description of the graphs of lymph node rudiments, qualitative description of the sinuses and their morphometric assessment using microscopic techniques and photographic matrices of preparations. Total production More than 35 thousand sections were recorded and analyzed and more than 1 thousand were subjected to morphometric evaluation work using image analysis [2].

## RESEARCH RESULTS AND THEIR DISCUSSION

The rudiment of the mesenteric lymph node of a rabbit on the 17th day prenatal development (Fig. 1) is compact accumulation of mesenchymal and lymphoid cells, which is located at the root of the common mesentery of the intestine on the ventral wall of the abdominal aorta at the level of the first lumbar vertebra, with dimensions  $(362.76 \pm 5.75) \mu\text{m}$  by  $(145.65 \pm 7.47) \mu\text{m}$  and with area at the cut  $(0.068182 \pm 0.005227) \text{mm}^2$ . In the lateral sections the formation of the marginal sinus is visible (Fig. 1), which is presented in the form of 2-3 slit-like cavities.



**Rice.** 1. The rudiment of the mesenteric lymph node of the rabbit. 17th day of prenatal development: 1 – primordium marginal sinus; 2 - rudiment of lymphoid tissue; 3 - root of the common mesentery of the intestine. Hematoxylin-eosin staining. About. 10, approx. 10.

In the spaces between them, the surrounding connective tissue is connected to the lymph node anlage. The width of the anlage of the marginal sinus is  $(28.82 \pm 3.84) \mu\text{m}$ , relative area is  $21.86 \pm 0.08\%$ . Other structures that stand out in the form of There are no regulated LUs at the stage under consideration. The rudiment of the popliteal lymph node of the rabbit is trained for



17 days tal period is presented in the form of cell- th ovoid-shaped cluster with dimensions  $(317.00 \pm 2.49) \mu\text{m}$  by  $(237.27 \pm 1.59) \mu\text{m}$  and area in a plane cut thickness  $(0.062972 \pm 0.001201) \text{mm}^2$ . Directly to The mesenchyme of the popliteal fossa is adjacent to the lymph node primordium. surrounded by the muscles of the thigh and lower leg. Along the periphery of the tissue howl bookmark LU is the emerging marginal sinus width  $(10.65 \pm 1.88) \mu\text{m}$  and relative flatness  $19.09 \pm 0.83\%$ . Between the laying areas of the edges of the left sinus, the connective tissue surrounding the bud of the LU, in 5-7 places, connected to the tissue anlage node. Bookmark capsule, which is the outer wall of the developing marginal sinus not delimited from the peri-nodular tissue and contrast is formed in the form of a structure with a thickness of  $(3.03 \pm 0.37)$  microns, consisting of a chain of flat cells with an elonga cytoplasm and elongated nucleus. Bookmark width marginal sinus of the mesenteric lymph node  $(28.82 \pm 3.84) \mu\text{m}$ , its absolute area  $(0.020702 \pm 0.000073) \text{mm}^2$  And relative  $(21.86 \pm 0.08\%)$  is significantly more, than in the rudiment of the popliteal node (width -  $10.65 \pm 1.88 \mu\text{m}$ , absolute area -  $(0.016734 \pm 0.000726) \text{mm}^2$  , relative -  $19.09 \pm 0.08\%$ ), in in all three cases  $P < 0.001$ . Mesenteric lymph node by the 23rd day of prenatalth period compared to the 17th day (Fig. 1), undergoes significant qualitative transformations. The most significant is the division of tissue - of the lymph nodes on the cortex and medulla. The capsule is formed mainly by two - three layers of spindle-shaped cells. Densely arranged connective tissue elements cops of the capsule along almost the entire length clearly separated from the perinodal tissue. In the area of the LU gate, forming tra- beculae. The marginal sinus has a more uniform pro- light compared to LU for 17 days. It does not contain pronounced expansion, characteristic of 17 days, indicating the origin of the sinus from the lymphatic phatic vessels. The peri-nodal tissue is associated with intranodal only in the gate area, although still consistent plots are stored on the side opposite the gate where the capsule is not completely delimited from the surrounding knot of fabric. The latter crosses the edge howling sinus into the lymph node tissue. Marginal sinus in single me- stakh through narrow slit-like spaces develop- of the internodular sinuses is connected with the cerebral lymphatic sinuses Developing internodes- the sinuses are represented as spaces sparse lymphoid parenchyma of the medulla stve, not separated by trabeculae. In the gaps of everyone single reticular cells are visible in the sinuses. Cor- The solid substance is homogeneous. Brain cords, internode- cerebral and cerebral sinuses tend to be oriented alignment in the direction of the gate. By the 23rd day in form When the capsule is formed, the compacting agent takes part peri-nodal connective tissue. In fruits 23 days in the mesenteric lymph nodes are well expressed brain- high lymphatic sinuses, which are as wide as light  $(11.02 \pm 0.85 \mu\text{m})$  exceed the marginal sinus  $(6.46 \pm 0.79 \mu\text{m})$ ,  $P < 0.001$ ). However, these structures are still small in number, so their absolute area in the cut plane  $(0.095880 \pm 0.011558 \text{mm}^2)$  and relative area  $(10.38 \pm 1.25\%)$  do not have a significant true difference from the same parameters of the regional si- noosa. The circumnodal sinuses are poorly developed  $(3.01 \pm 0.52\%$  of the cut area). In the popliteal lymph node of the fetus qualitatively new compared to the pre-fetal period called the appearance of slit-like spaces in the pa- renchima LU. These spaces are formative intervening intermediate (peri-nodular and medullary) gov) sinuses. They are located mainly in the middle parts of the node, having different directions. Together At the same time, there is a clearly visible tendency to orient them in direction of the gate. Single slit-like pro-wanderings are associated with the marginal sinus, most none of them has such a connection. Intermediate sinu- sy appear wider than the marginal ones, and in the middle sections of the node there are intermediate systems the noses are wider the closer to the periphery. However, they don't make it possible to further differentiate the



cortical a creature from the brain, which is considered as part of the assembly corresponding to the location of the meat cat cords and intermediate medullary sinuses. Therefore, it is difficult to attribute these spaces to pro- interstitial cortical or intermediate medulla gov sinuses, as well as accurately qualify areas of parenchyma that are pulpy tissues Zhami. Less erroneous would be the assessment of the relationship wearing of developing intermediate sinuses with the surrounding lymphoid tissue at this stage ne development of the node as "rarefaction of the parenchyma of the organ- on" as a whole, without differentiation of intermediate sinuses into cortical and cerebral sinuses and without separation pulpy cords. The width of the marginal sinus is Day 23 ( $7.10 \pm 0.89 \mu\text{m}$ ) tends to decrease compared to the pre-fetal period od ( $10.65 \pm 1.83 \mu\text{m}$ ), although this difference is insufficient absolutely ( $P > 0.05$ ). The last circumstance can be interpreted as a sign of stabilization in the pre- formations of lymphatic vessels, of which the marginal sinus is formed. Forming width existing intermediate sines in the plane of the median behind the popliteal node ( $11.03 \pm 0.99 \mu\text{m}$ ) more, than marginal ( $7.10 \pm 0.89 \mu\text{m}$ ,  $P < 0.01$ ).

## CONCLUSION

1) Back in 1965, A. Polikar pointed out that many diseases are treated as if lymph there is no logical system at all [6]. Fran-Zuz scientist objectively stated the clinical some and fundamental facts of that time in the area lymphology: "Despite the value and numerous the inadequacy of the latest research on structure and functions of the lymphoid system, it is all still continuing to be one of the most nasty components of the body" [6, p. 199].

2) Embryogenesis of the sinuses of lymph nodes of various localizations tion is characterized by asynchronous development. Formation of the visceral drainage system LU occurs more intensely than somatic ones. tion is characterized by asynchronous development. Formation of the visceral drainage system LU occurs more intensely than somatic ones.

3) What is common in the formation of sinuses of the lymph nodes is independent depending on the localization of organs is consistent physical transformation of their rudiments. The most the combination of simultaneouslyth formation of messages of the marginal sinus with the ob- the part of the gate through the slit-like rudiments of the inter-exact sines

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