ВОЗРАСТНЫЕ ОСОБЕННОСТИ НЕРВНОГО АППАРАТА ПЕРИКАРДА

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AGE FEATURES OF THE NERVOUS DEVICE OF A PERICARDIUM

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Due to the development of new transpericardiac accesses to heart further detailed researches of the receptor device of a pericardium of the person in various age groups, with clarification of zones of concentration of nervous elements in various areas of a pericardium are necessary.

In recent years there was a large number of the morphological works devoted to research of an innervation of organs of a thoracal cavity to whom extensive data on topography and anatomic features of nervous plexuses of a thoracal cavity are presented.

In this regard the special attention is deserved by research of a becoming of the nervous device of a pericardium at various stages pre-and a post-natal ontogenesis.

Age features of the nervous device of a pericardium.

When studying the intraorganny nervous device of a pericardium in pre-and a post-natal ontogenesis we allocated two main stages: the first stage - from the formation beginning till the birth; the second stage - from the neonatality period to senile age. During the first stage there is a formation of the neuroreceptor device of a pericardium, the free terminations of a simple form (3-4 lunar months) intensively develop. This period is characterized by existence the bezmyakotnykh of the fibers which are settling down on a course of vessels. Further there are separate nervous fibers with existence of seldom located varikoznost. Trailer devices are presented by accentuations, club-shaped thickenings. The fourth month of germinal life is characterized by concentration of nervous elements mainly on a lobby, and also the antero-lateral pericardium surfaces. Receptors in the form of short moustaches, furculas and diffuse arborization are taped.

At the age of 5-10 months of fetal life the bagged terminations develop, plexuses are formed. Thus on the fifth month of the prenatal period of development process of formation of nervous plexuses proceeds more intensively. Nervous fascicles and stalks send numerous lateral branches, their extent is considerably enlarged. Along with the diffuse terminations there are small compact bushes. At this age bagged little bodies like Fater-Pachini which are localized, as a rule, about vessels and nervous stalks are put. They meet as separately, and in the form of group clumps.

The sixth month of fetal development is characterized by further augmentation of number nervous stalks all studied areas (zones) of a pericardium. There is a peculiar streamlining of a locating of the free terminations which terminals are even more often focused on a course of collagenic fibers of a pericardium; the bifurcation and their length are enlarged. For the seventh month differentiation of nervous plexuses according to pericardium layers is characteristic. In a blanket the superficial plexus formed quite large nervous stalks is formed. The nervous plexus of a deep layer consists of thinner stalks which originate from a superficial plexus. Thus, both plexuses are integrally bound among themselves. The receptor device becomes complicated, there are terminations with diffuse type of the branching which terminals pass from one layer of a pericardium into another. Except Fater-Pachini's developing little bodies Krause's flasks are taped. At fetuses of 8-10 months in a blanket of a pericardium neurovascular complexes which are less expressed in its deep layer are formed. In these terms of more accurate there is a picture of distribution of plexuses according to pericardium layers: the melkopetlisty - in a blanket, krupnopetlisty - in deep.

In a deep layer not free kustikovidny receptors are found. The bagged nervous terminations are in the most various stages of "maturing" that allows to track dynamics of their formation distinctly. The second stage - from the birth to senile age. Newborns, children of thoracal and early children's age have differentiation of superficial and deep plexuses, reorganization and progressive complicating of the neuroreceptor device (especially bagged little bodies).

Nervous plexuses of a pericardium of newborns (in comparison with fetuses) become more potent at the expense of a thickening forming them nervous stalks and augmentations of quantity of myelinic fibers.

In the first week after the birth as a result of a peculiar reorganization of the neuroreceptor device quite large number of the receptors which are exposed to a "physiological" boring (in comparison with the similar phenomena during fetal development) is found. Receptor devices in a pericardium of newborns change towards decrease of number of the diffuse terminations and augmentation of quantity of compact arborization. Against decrease of number of the diffuse terminations a quaggy not bagged glomulus is clearly visible. Bagged receptors in the period of a neonatality become larger. In a quantitative sense among bagged receptors Fater-Pachini's little bodies prevail.

For the first year of life of the child there is a strengthened development of nervous elements in those zones of a pericardium, which lie to a lung root, an apex of heart and an esophagus. It is bound to mechanical impact on these zones rhythmic functioning organs. Along with simple and bushidius forms of the nervous terminations, on the first year of life of the child in a pericardium there are also more difficult clewidius receptors to which fibers of large and average calibers approach.

From a year till three years further complicating of the neuroreceptor device of a pericardium is defined. At this age it is presented by the varied in form free and bagged nervous terminations. The quantity the clewidius of not bagged receptors increases, they become more compact and show predilection to a locating near vascular and nervous trunks. At the same time with without bulbterminals bagged receptors become complicated also. There is with bag glomulus.

In a pericardium of children of three-seven years nervous plexuses become even more potent. Changes not only structure nervous стволиков these plexuses, but also their form and a locating a little. There is an exchange of fibers in the form of triangular figures and "Hiazm". At this age various stages of formation of the bagged nervous terminations are observed. That if in the period of a neonatality among them receptors like Fater-Pachini's little bodies prevailed is characteristic, during this age period the augmentation of receptors like Krause's flasks and a bagged glomulus is observed. At the age of 8-12 years of essential morphological changes in the nervous device of a pericardium it isn't observed, the most characteristic feature for this period is some relative decrease of concentration of nervous elements in a pericardium that it is possible to bind to rapid growth of the most pericardiac bag.

Further age transformations of the nervous device of a pericardium belong to teenage and youthful age and are expressed, first of all, in change of architecture of a deep nervous plexus: it at the expense of augmentation of communications between fascicles forming becomes. In this period a compact glomulus is very numerous. It is characteristic that formation process, having begun at early children's age, proceeds at young men to what existence in a pericardium of teenagers and the young men of the terminations of this type who are at various stages of development testifies. Besides, in a pericardium we repeatedly stated the phenomena of budding of bagged little bodies.

The mature age is characterized by a final becoming of the nervous device of a pericardium and its relative stabilization. The nervous terminations during this period reach high degree of a differentiation. In all areas of a pericardium the free receptors having an appearance of treelike bifurcations and compact bushes are found.

In the second half of mature age (36-60), namely from 55-60 years some reorganization of the nervous device of a pericardium is defined. First of all change of concentration of nervous conductors in various departments of a pericardium becomes perceptible. In the field of averages and the bottom zones of a forward surface of a pericardium number nervous Stalks and density of plexuses decreases, and in the top zones of a lobby and a back surface (that corresponds to forward and back transitional cords) remains without changes. In nervous fascicles there are separate nervous fibers with the boring phenomena, giperimpregnirovanny nervous fibers, and also fibers with dyschromia sites are observed. Separate nervous fascicles get izvity a course. After 60 years in nervous fascicles of pericardiac plexuses thick nervous fibers with rough contours, varicose

thickenings and small flows of a neuroplasm are taped. These changes of separate nervous fibers become perceptible against a large number of invariable nervous conductors and can be surveyed as reactive. From receptors at this age some coarsening of terminals of the free terminations and rising of their argentofilnost becomes perceptible. Thus, received age dynamics of the neuroreceptor device of a pericardium showed the following: at early stages of a prenatal ontogenesis one plexus which further, in connection with development of structure of the pericardium, is divided into two - superficial and deep is initially formed. The deep plexus has in the beginning a shirokopetlisty form. Further it becomes complicated, its topography is closely bound to loops of vascular plexuses of superficial and deep layers. The receptor device of a pericardium is formed gradually, in the beginning on the 3rd month of fetal development the free terminations of the elementary type, and then (4,5-5 months) are defined - the bagged. In the period of a neonatality against the strengthened differentiation of the nervous terminations in a series from them pictures of a reactive boring are observed, further they are exposed to destructive changes.

The interrelation existing in a pericardium nervous stalks and blood vessels is characterized by extreme inconstancy. Inconstancy is caused by way of division of blood vessels and nerves accompanying them: not always similarity of their topography and the subsequent division is expressed rather accurately. Nervous fibers are bound to a vascular wall both innervate it, and passing transit. Nervous stalks, crossing in various directions blood vessels, in process of penetration into a pericardium, become wider and more dense. When crossing vessel by a nerve in several places, in each of such sites the similar divergence of fibers is formed. Spreading nervous stalks over and under vessels - a phenomenon widely known. The specified reorganization of afferent conductors in crossing places with blood vessels is observed how E. B. Hiseman (1957) specifies, in organs and tissues with plane structure. The author defined this phenomenon as "a phenomenon of on vascular reorganization" afferent conductors, to us such forms of the relations between a vessel and a nerve at which the nerve forms the loop covering a vessel met also. The relations of nerves to a vascular glomulus formed by capillaries are interesting. Studying of similar sites on macro-microscopical preparations showed that the separate nervous fibers suitable to a vascular glomulus, in the last pass from one nerve into another. Near vascular nerves form dense perivascular plexuses round blood vessels.

Receptor devices in a pericardium of newborns change towards decrease of number of the diffuse terminations and augmentation of quantity of compact arborization. On this background appears quite quaggy bagged glomulus of a spherical, oval and oblong form formed by an interlacing of bomb ways of one, sometimes of two pulposus fibers. Such receptors settles down near nervous trunks more often or adjoin to walls of blood vessels and slightly less often freely lie among cellular elements of a pericardium Systematic research of a pericardium, newborns on zones

shows that is more various than forms and number of receptors prevail on perednebokovy and forward surfaces of a pericardium. Here the set of arterial and venous vessels of various caliber with which the nervous terminations enter the closest relationship branches. In the bottom zone of a forward surface of a pericardium incapsulation of the termination is formed by receptor fields. On back and diaphragmal surfaces bagged receptors meet less often and, as a rule, have the same spherical form.

To the quantitative relation among bagged receptors which we saw in a pericardium the neocore, it is obvious prevail Fater-Pacheni's little bodies. For the first one and a half years of life of the child there is a strengthened development of nervous elements in those zones of a pericardium, which adjacent to a lung root, an apex of heart and an esophagus. This process is expressed in significant increase in diameter nervous stalks, branching by the terminals in places of contact with other organs. Similar stalks have usually larger extent and at first almost don't give lateral branch. Their sources in most cases are the main nervous trunks which are focused on a course of collagenic fibers. The last on the extent widely branch, however, it isn't possible to establish any pattern in their decision: branches depart at various level, under peer forces, are symmetric or azygomorphous. They often are crossed, unite among themselves, difficult setevidny designs exchange fascicles of nervous fibers, forming in a pericardium.

The receptor device of a pericardium aged from one and a half and three years of development of the child is presented by the varied in form "free" and bagged nervous terminations. Especially there are a lot of different types of the terminations on a lobby, a pericardium surface in average and external zones. The tendency the brushideus of receptors to formation of compact forms is clearly noticeable, diffuse brushideus receptors meet less often." Free" the nervous terminations in all the pericardium are created at the expense of terminals of pulposus fibers of an average and small caliber. On their terminals all are less often taped neuroplasm flows. They still prevail over other types of receptor devices. The quantity the clewideus the not encapsulated of receptors considerably increases, they become more compact and show predilection to is located close neurovascular trunks. At the same time with without capsule stalks bagged receptors are improved also. There is with bagsglomulus. They are formed stalks thick pulposus fibers, trailer departments branch and form difficult intertwining compact glomulus surrounded with quite dense capsule, consisting of a set of plates, closely adjacent one to another. Similar receptors usually freely lie among connective tissue elements of a pericardium.

Thus in a blanket of a pericardium mainly pulposus fibers, and in deep - amialinovy and small-bore pulposus lie.