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FALLO TETRADASIDA O'NG QORINCHA KOMPONENTLARI TO'QIMASIDAGI GISTOKIMYOVIY JIXATLAR

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✓ ***Rezyume***

Yurak tug'ma nuqsonlaridan bo'lgan kombinasiyalashgan Fallo Tetradasining morfologik jixatlaridan biri bu o'ng qorinchaning morfologik adaptasiyasidir. O'ng qorincha perimembranoz soxasidagi miokardning gistioarxitektonikasida keskin o'zgarishlarning xomila ichi yoki genetik xromosoma kasalliklaridagi o'zgarishini morfologik va molekulyar genetik jixatlari to'la to'kis o'rganilsada, muammoning dolzarbligi xanuzgacha davom etmoqda. Dunyoda Fallo tetradasining uchrash darajasi yil sayin 0,2% ga oshib, jami yurak tug'ma nuqsonlarining 4,5-9,7%ni tashkil etsa, ushbu patologiya O'zbekistonda 11,2%ni tashkil etadi. Aynan bizning xam ishimizda yurak tug'ma nuqsonlarini o'rganishda, shik, Shiff va Van Gizon usullari orqali bo'yalgandan keyin aniqlangan morfologik o'zgarishlar xaqida ma'lumotlar keltirildi.

Kalit so'zlar: morfologiya, yurak tug'ma nuqsoni, Fallo tetradasi, SHYK, Shiff va Van Gizon.

ГИСТОХИМИЧЕСКИЕ АСПЕКТЫ В ТКАНИ КОМПОНЕНТОВ ПРАВОГО ЖЕЛУДОЧКА ПРИ ТЕТРАДИ ФАЛЛО

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✓ ***Резюме***

Одним из морфологических аспектов комбинированной тетрады Фалло от врожденных пороков сердца является морфологическая адаптация правого желудочка. Хотя морфологические и молекулярно-генетические аспекты резких изменений гистиоархитектоники миокарда в перимембранозной области правого желудочка при внутриутробных или генетических хромосомных заболеваниях изучены в достаточном количестве, актуальность проблемы сохраняется до сих пор. В то время как в мире частота встречаемости тетрады Фалло ежегодно увеличивается на 0,2% и составляет 4,5-9,7% от общего числа врожденных пороков сердца, в Узбекистане эта патология составляет 11,2%. В нашей работе были представлены данные о морфологических изменениях, выявленных при изучении врожденных пороков сердца после окрашивания методами ШИК, реакцией Шиффа и Ван Гизона.

Ключевые слова: морфология, врожденный порок сердца, Тетрада Фалло, шик, Шифф и Ван Гизон.

HISTOCHEMICAL ASPECTS IN THE TISSUE OF THE COMPONENTS OF THE RIGHT VENTRICLE IN THE TETRALOGY OF FALLOT

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✓ ***Resume***

One of the morphological aspects of the combined Tetralogy of fallot from congenital heart defects is the morphological adaptation of the right ventricle. Although morphological and molecular genetic aspects of abrupt changes in myocardial histioarchitectonics in the perimembranous region of the right ventricle in intrauterine or genetic chromosomal diseases have been studied in sufficient quantity, the relevance of the problem remains to this day. While in the world the incidence Tetralogy of Fallot increases annually by 0.2% and is 4.5-9.7% of the total number of congenital heart defects, in Uzbekistan this pathology is 11.2%. In our work, we presented data on morphological changes detected during the study of congenital heart defects after staining by PAS, Schiff-iodic acid reaction methods, the Schiff and Van Gieson reaction.

Keywords: morphology, congenital heart disease, Tetralogy of Fallot, PAS, Schiff-iodic acid reaction (SIA), Schiff and Van Gieson.

Relevance

The urgency of the problem lies in the fact that in the Republic of Uzbekistan Tetralogy of Fallot occurs 1.4 times more often than in other countries of the world, 1.1 times more often than in Central Asian countries, which is explained by an increase in the demographic indicator of the population, and on the other hand, a large number of related marriages, which are one of the national values of the Uzbek people. However, due to incomplete screening examination in the early stages of pregnancy and non-compliance with recommendations for termination of pregnancy with detected congenital heart defects, there is a different degree of growth rates of these pathologies. The frequency of occurrence Tetralogy of Fallot per 1000 newborns in 2022, according to rpam, is 23-27 cases. Of course, this data analysis shows the number of identified patients. The detection of the Fallot tetrad in the USA and European countries during screening examination during pregnancy and the unconditional implementation of the practical recommendation for termination of pregnancy in accordance with the above procedure indicates that the morphological substrates of the processes of morphological adaptation in the heart tissue in the postpartum period have not been fully studied. Although data on the morphological adaptation Tetralogy of Fallot have been enriched by various scientific studies in most countries of the Russian Federation and the CIS, full-fledged data on its changes under the influence of regional geographical and climatic factors have not been presented.

The purpose of scientific research: to study and analyze the morphological and histochemical features of the Tetralogy of Fallot with congenital heart defects.

Materials and methods

In the Republican Center of Pathological Anatomy and the National Children's Center, an autopsy of the heart tissue of 56 infants under the age of 1 year who died of congenital heart disease is carried out. Using the mofrological method, incisions obtained from cardiac tissue are solidified in 10% buffered formalin for 72 hours. Then it is dehydrated in vegetable (70,80,90,100%) alcohol after 1 hour of rinsing in running water. Then the pieces are solidified in paraffins and poured into cassettes. With the help of a microtome, sections with a thickness of 5-7 microns are obtained, dewaxed in xylene and stained with hematoxylin and eosin. The obtained results are examined in a light microscope, taken on microflares and analyzed morphometrically. The Van Gieson method makes it possible to identify fuchsionophilic fibers, consisting mainly of coarse-fibrous structures of the myocardium, with the determination of collagen fibers with a morphological substrate of dark red color. Morphological studies conducted with the help of PAS, Schiff-iodic acid reaction show that mucopolysaccharides accumulate in the intercellular spaces, and this process indicates that hypoxia has occurred in the tissue. The Schiff method was carried out to confirm the

accumulation of acidic mucopolysaccharides in the spaces between ham cells, suggesting that the presence of coarse fibers and Schiff-positive structures along the perimeter of cells in the blue breast means that intermediate substances accumulate in the foci of morphofunctional stress.

The results of the study and their discussion: morphological changes of the right ventricle of the heart in Tetralogy of Fallot from the methods of histochemical examination in order to determine the qualitative indicators, Van Gieson dye was used. At the same time, the analysis of the results showed that hypertrophy-the formation of most coarse structures in the spaces between bundles of cardiomyocytes-is characterized by the detection of fuchsinophilic fibers (see Fig.1).

In the intervals between cardiomyocytes of the right ventricle, tetrad Fallot revealed the phenomenon of slage in the vessels, an increased number of coarse collagen fibers, a strong development of sclerotic changes in perivascular areas, enhanced detection of intermediate tumors. These changes are morphofunctional signs that cardiomyocytes in morphofunctionally active areas have different sizes, the branching of bundles of myocytes around coarse fibers means that the right ventricle contracts out of sync. However, it was found that in the cytoplasm of atypical cardiomyocytes (pacemaker cells) located along the perimeter of the right ventricle, a large number of light pink inclusions (glycogen). See Figure 1).

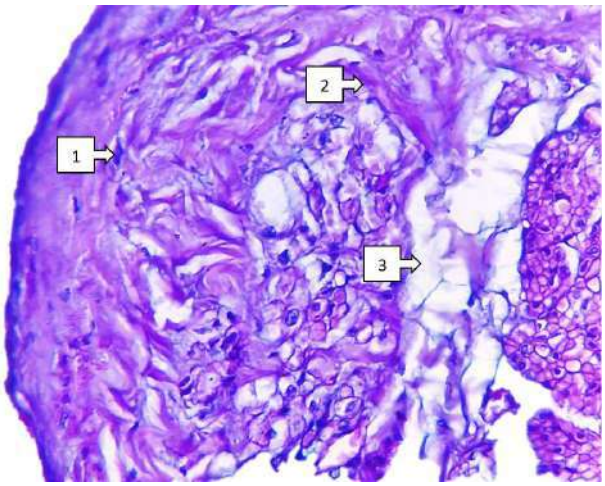

Figure 1. Interventricular Barrier defect subvalvular area. Foci formed by Schiff-positive structures are detected in the anterolateral and subvalvular regions of the right ventricle (1), coarse fibers formed in the interval are detected in the myocardium (2). Intermediate tumors have formed in large sizes (3). The paint is Alcian blue. Size 20x10.

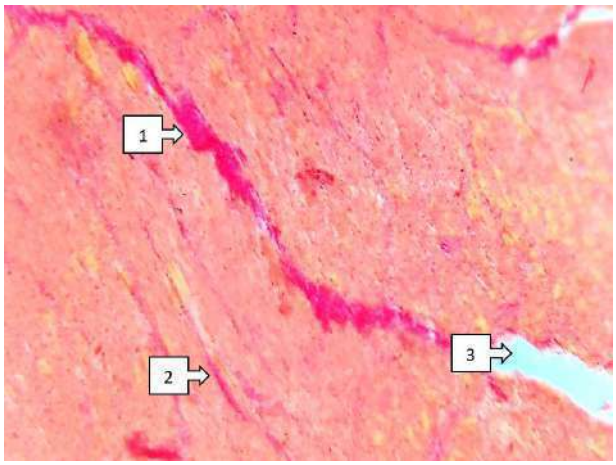

Figure 2. Tetralogy of Fallot. Myocardium of the middle region of the right ventricle. Fuchsinophilic fibers formed in the interventricular spaces (1), small focal coarse fibers are found in the intervals between cardiomyocytes (2), uneven interstitial edema is detected in the intervals (3). Paint G.E. Size 40x10.

With Tetralogy of Fallot, minor changes in the histioarchitectonics of most capillaries are observed, caused by hypertrophic changes in most cardiomyocytes of the ventricular myocardium. This, in turn, leads to a partial violation of blood circulation in the capillaries and an increase in the permeability of the capillary wall in violation of the laws of hemodynamics. The resulting focal plasmorrhagia causes interstitial edema, causing ruptures or enlarged foci between the stair discs into which cardiomyocytes sink, causing synchronous contractions. At the same time, the phenomenon of sladge occurs in the expanded capillaries. This, depending on the duration of the process, leads to the activation of fibroblasts and the proliferation of sparse fibrous structures in these areas. This leads to atrophic changes in bundles of cardiomyocytes with low functional activity, which ultimately do not undergo hypertrophy yet. As a result, it is clinically morphologically characterized by the emergence of conditions for the development of arrhythmic contractions in the contractions of the heart. It is characterized by the emergence of conditions for the development of necrobiotic processes in focal cardiocytes caused by the formation of coordinated erythrocytes-microtubules in capillaries (see Fig.2).

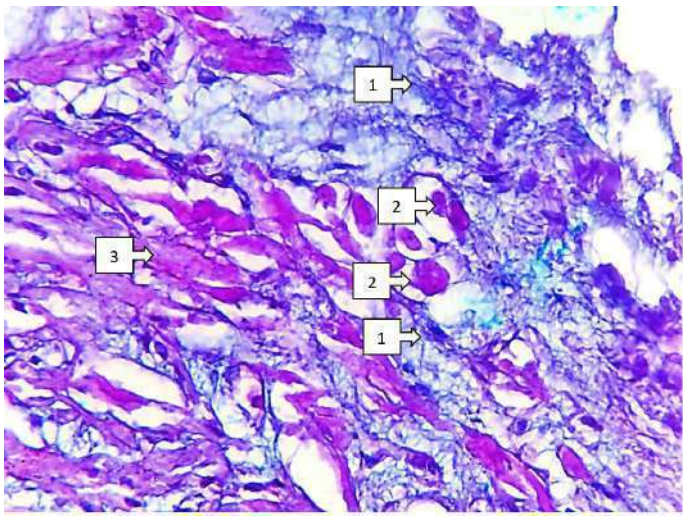

Figure 3. Tetralogy of Fallot . The right ventricle is part of the sucking muscle. In most cardiomyocytes, fatty dystrophy and pericellularly located Schiff-positive structures are detected (1), various chaotically located coarse fibers and foci of edema around atypical conductive cardiomyocytes are detected in the subendocardial region (2), morphofunctionally active cytoplasm of cardiomyocytes is dark pink (3). Paint G.E. Size 40x10.

The development of various teardrop-shaped age-related dystrophies with foci in the cytoplasm of cardiomyocytes as part of the sucking muscle of the right ventricle leads to a sharp hypertrophy of morphofunctionally active cardiomyocytes, macroscopically unevenly distributed over the surface of the sucking muscle. As a result, atrophic altered cardiac cardiomyocytes proceed with thickening of the endocardium and the development of foci of fibroelastosis on surfaces close to the endocardium (see Fig.3).

In particular, foci of fibroelastosis and cytoplasm of Purkin cells develop in the endocardium of the right ventricle adjacent to the lower left ventricle with the formation of various granular basophilic inclusions. This, in turn, is accompanied by interstitial edema around the foci of fibroelastosis, increased scarring processes penetrating the myocardium. Macroscopically, the formation of foci continues, characterized by the detection of uneven uneven surfaces in the lower region of the right ventricle and on its surface facing the area of the interventricular barrier.

Abrupt changes do not develop in the left ventricle, on the contrary, the uniformity of the majority of cardiomyocytes in volume remains, in the capillary network, the majority with the same normal fullness, is characterized by a relatively small development of interstial edema. The bundle structure and histioarchitectonics of most cardiomyocytes with an endocardial arrangement look the same, and cardiomyocytes with fatty degeneration are practically not detected, which, in turn, means an ordered arrangement of cardiomyocytes of morphofunctionally the same size. In cardiomyocytes of subpericardial regions, the same changes are detected as in most functionally active foci of cardiomyocytes, whose changes occur near the subvalvular region: hypertrophied cardiomyocytes, irregularly located edema, the phenomenon of slage is detected in capillaries. The root cause of these changes is a thickened endocardium in perivascular areas that has undergone fibroeastosis, Purkin cells develop in most gapns due to hydropic dystrophy, signaling non-synchronous contractions of cardiomyocytes. However, it was found that in these

areas cardiomyocytes evolved with improved detection of sparse fibrous structures in space and with the appearance of gross sclerotic changes around smaller vessels.

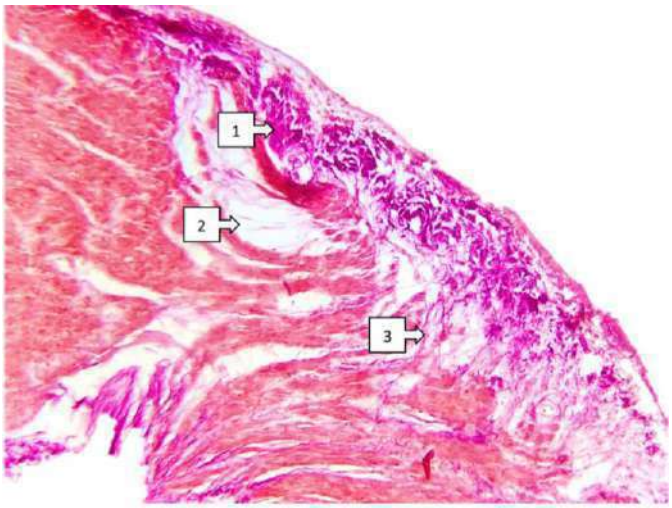

Figure 4. Tetralogy of Fallot. In the subvalvular region of the left ventricle, a focus of fibroelastosis (1), intermediate tumors (2), destructive changes in fibrous structures (elastolysis) (3) are detected. Van Gieson paint. Size 40x10.

Conclusion

Consequently, aspects characteristic of morphological changes occurring in congenital heart disease, focal cardiomyocyte hypertrophy, sclerotic changes around blood vessels, interstitial edema and foci of fibroeastosis are determined. Of the most noticeable changes, focal thickening of the endocardium, group atrophic changes of cardiomyocytes located around the heart valves, subendocardially, lipamatous foci in the pericardium and medium- and small-drop fatty dystrophic changes in the cardiomyocytes of the right ventricle are revealed. These changes from the combined types of congenital heart defects are detected with tetradophalloids, defects of the interventricular barrier, transposition of the main vessels of the heart. These changes manifest themselves differently in different areas of the fog (anterior, lower ventricle and interventricular barrier) depending on the localization of congenital heart defects. In the clinically morphologically blue type of heart defects of most congenital heart defects, the primary of most cardiomyodestructive changes is found in the right ventricle. These changes continue with the development of chronic venous fullness within the large circulation. As a result, the heart ends with the rapid development of right ventricular failure.

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