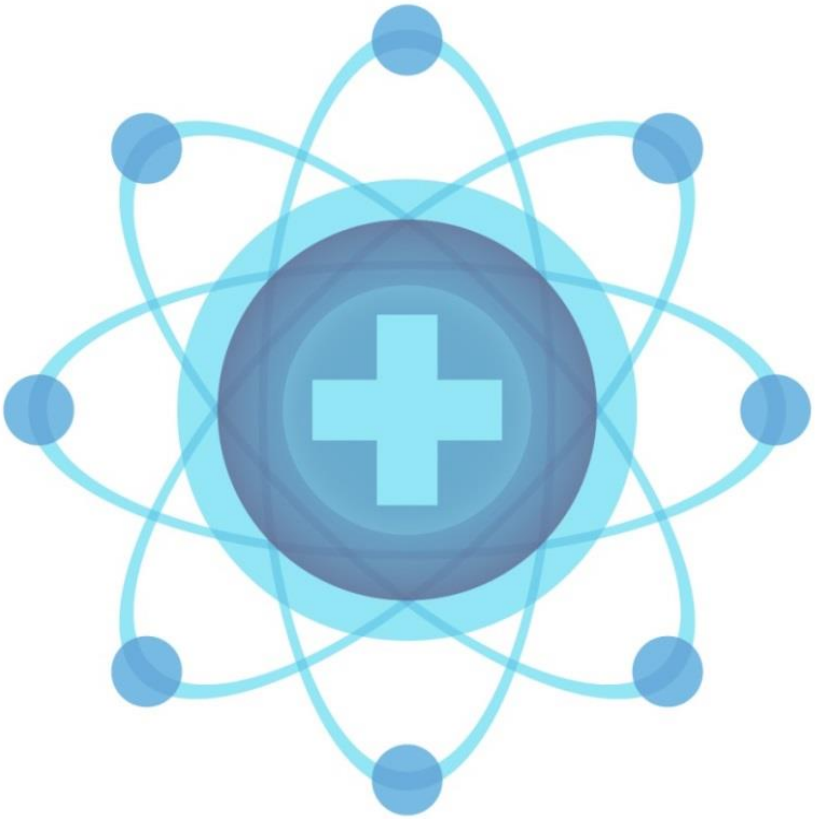

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Morphological characteristics of congenital heart defect tetrado Fallo in Bukhara region

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Abstract: The regional distribution of congenital heart defects is different in the territory of Uzbekistan, and the morphological aspects of the tetrad of Fallo, which accounts for 8.7% of congenital heart defects in the Bukhara region, were studied. Histioarchitectonics, which is one of the characteristic aspects of congenital heart defect or blue type of heart disease, was studied in Bukhara region. In this study, Tetra of Fallot was characterized morphologically by the detection of hypertrophic and dystrophic changes in the myocardium of the right ventricle, and atrophic and sclerotic changes in the cardiomyocytes of the left ventricle.

Keywords: morphology, congenital heart defect, tetrad of Fallot myocardium, dextraposition, atrophy, hypertrophy, sclerosis.

Relevance of the topic: Congenital heart defect, identified by the French doctor Etienne Louis Arthur Fallot, is one of the most complex defects among all congenital heart defects. Tetrado Fallo is manifested in the heart by pulmonary artery stenosis, intercompartmental barrier defect, aortic disposition, and right ventricular hypertrophy. These pathological changes are manifested by specific histotopographical changes of the heart myocardium. Based on this, the modern classification of congenital heart defects has been proposed in many different nomenclature options. These classifications are explained by the frequency of regional occurrence, failure to fully meet the requirements, the origin of congenital heart defects, genetic, environmental, occupational factors. Congenital heart defects make up 20.8% of all heart diseases in Uzbekistan. In Uzbekistan, every 100 babies have a congenital heart defect, so 0.08% of them are Tetrado Fallo and are treated only by operative treatment. To be more precise, if an average of 530,000 babies are born in Uzbekistan in a year, 1% (5300) of them are congenital heart defects, 25% of them are patients who need surgery, and 8% of 5300 are Tetrado Fallo. is enough. This numerically means that 106 babies are born every year in Uzbekistan with the diagnosis of tetrad of Fallo.

The urgency of the problem is to study the distribution of Tetrado Fallo in the Bukhara region of the Republic of Uzbekistan and its specific aspects from the morphological point of view. In the Bukhara region, the average number of congenital heart defects diagnosed in a year is 32-38 Tetrad Fallo.

Purpose: to study and analyze the incidence of congenital heart defects, anatomical, histological and morphometric changes in Bukhara region.

Material and methods: the clinical anamnestic data of heart tissue and disease history taken from autopsy of 65 babies who died of congenital heart defect in Bukhara Region Pathological Anatomy Expert Bureau are analyzed. Sections taken from heart tissue by the morphological method are frozen in 10% buffered formalin

for 72 hours. Then after rinsing in wastewater for 1 hour, it is dehydrated in ascending alcohols (70,80,90,100%). The slices are then frozen in paraffin and poured into cassettes. Using a microtome, 5-7 μm thick sections are taken, deparaffinized in xylene, and stained with hematoxylin and eosin. The obtained results are viewed under a light microscope, micrographs are taken and morphometrically analyzed.

Research results and their discussion: In the discussion of the studied data on the morphological changes of the right ventricle of the heart in the tetrad of Fallo, the following was determined. Group hypertrophy of right ventricular myocardial cardiomyocytes was mostly detected in the area of anterior wall of ventricle. Including branched hypertrophy of cardiomyocytes, large hyperchromic, clearly delineated cells with transverse extension are detected in the 200X field of view. The number of large cardiomyocytes was 220-255 in the 200x field of view. Compared to the control group, it was found to be 2.25 times (up to 100-125), the size increased by 2.5 times. Vessels between cardiomyocytes: capillaries and small-caliber blood vessels 1.75 times less than the control group. These changes mean that compensatory mechanisms in the right heart area are clearly developed. At the same time, it was found that in the cytoplasm of atypical cardiomyocytes (pacemaker cells) located along the perimeter of the right ventricle, a large number of pale pink inclusions (glycogen) were found. Cavernous appearance of different widths of lymphatic vessels interspersed with cardiomyocytes was found (see Fig. 1).

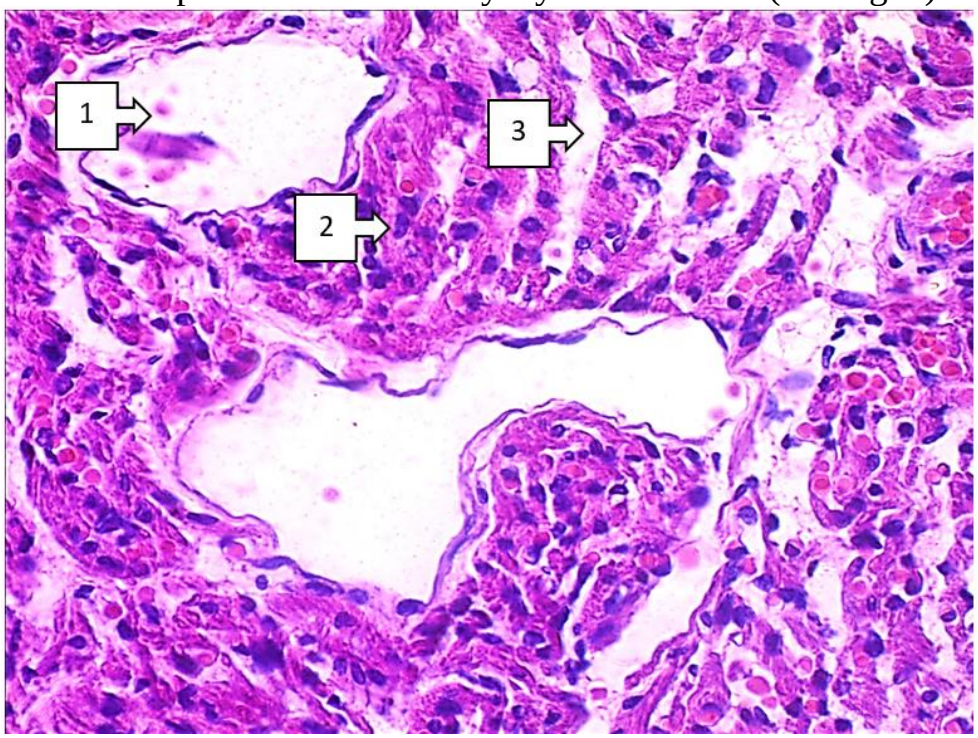

Figure 1. Tetrado Phallos. Myocardium of the anterior lateral branch of the right ventricle. Cavernous dilated lymphatic vessels (1), tufted appearance of large hyperchromic cardiomyocytes (2), uneven interstitial swellings are detected in the interval (3). Paint G.E. The size is 20x10.

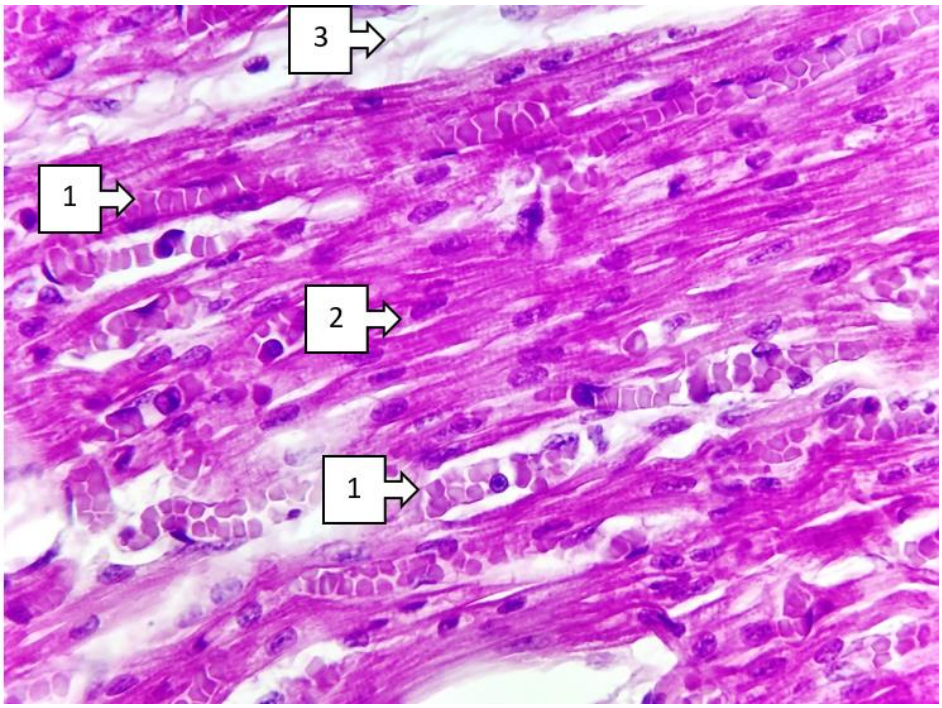

Figure 2. Tetrado Phallos. Myocardium of the middle branch of the right ventricle. Sludge phenomenon in most capillaries (1), tufted appearance of large hyperchromic cardiomyocytes (2), uneven interstitial swellings in the interval are determined (3). Paint G.E. The size is 40x10.

Due to hypertrophic changes in most cardiomyocytes of the ventricular myocardium, some changes in the histioarchitectonics of most capillaries are observed in Tetrado Phallus. This, in turn, violates the laws of hemodynamics, causes blood circulation in the capillaries to become partially impaired and the permeability of the capillary wall to increase. As a result, focal plasmorrhagia causes interstitial edema, discontinuities or dilated foci between the interstitial discs that submerge cardiomyocytes, derailing synchronous contractions. At the same time, it creates the phenomenon of sludge in the expanded capillaries. This, depending on the duration of the process, leads to the activation of fibroblasts in these areas and the increase of sparse fibrous structures. As a result, it leads to atrophic change of bundles of cardiomyocytes that have not undergone hypertrophy and have low functional activity. As a result, heart contractions are clinically morphologically characterized by conditions for the development of arrhythmic contractions. It is characterized by the creation of conditions for the development of necrobiotic processes in cardiomyocytes with a focus due to the formation of microticin by sludged erythrocytes in the capillaries (see Fig. 2).

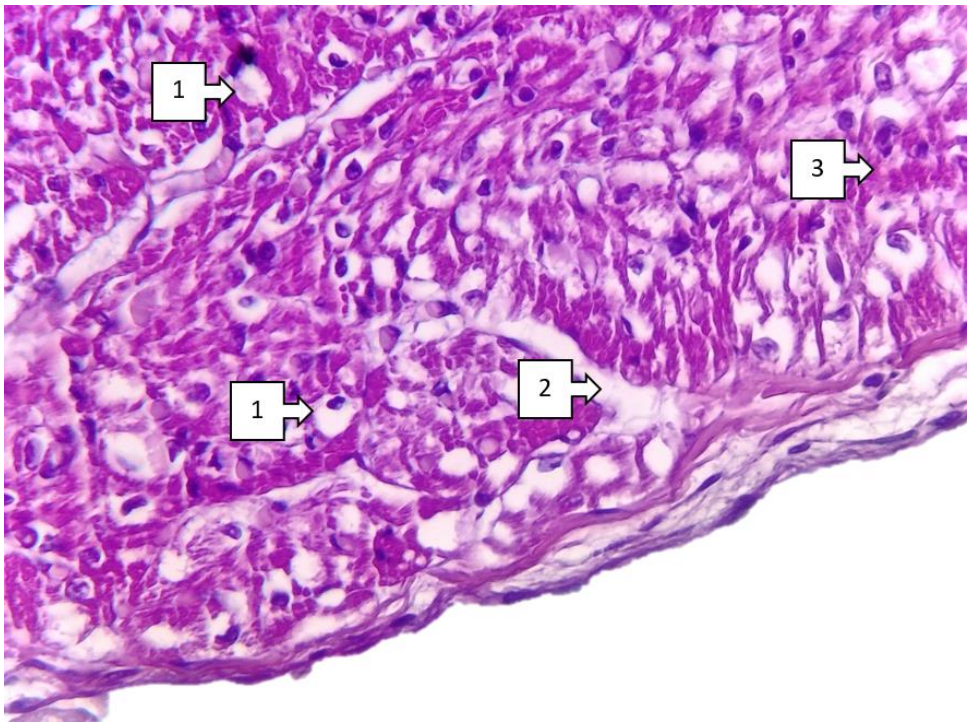

Figure 3. Tetrado Phallos. A part of the right ventricular papillary muscle. In most cardiomyocytes, fatty dystrophy has medium and small droplet-like foci (1), smooth interstitial edema in the subendocardial area (2), cytoplasm of morphofunctionally active cardiomyocytes is dark pink in color (3). Paint G.E. The size is 40x10.

In the cytoplasm of cardiomyocytes in the right ventricular papillary muscles, the development of focal dystrophies in the form of various droplets continues, leading to sharp hypertrophy of morphofunctionally active cardiomyocytes, and macroscopically, the appearance of rough fibrous surfaces on the papillary muscle surfaces. As a result, atrophic changes in cardiomyocytes continue with thickening of the endocardium and the development of foci of fibroelastosis on the surfaces close to the heart endocardium (see Fig. 3).

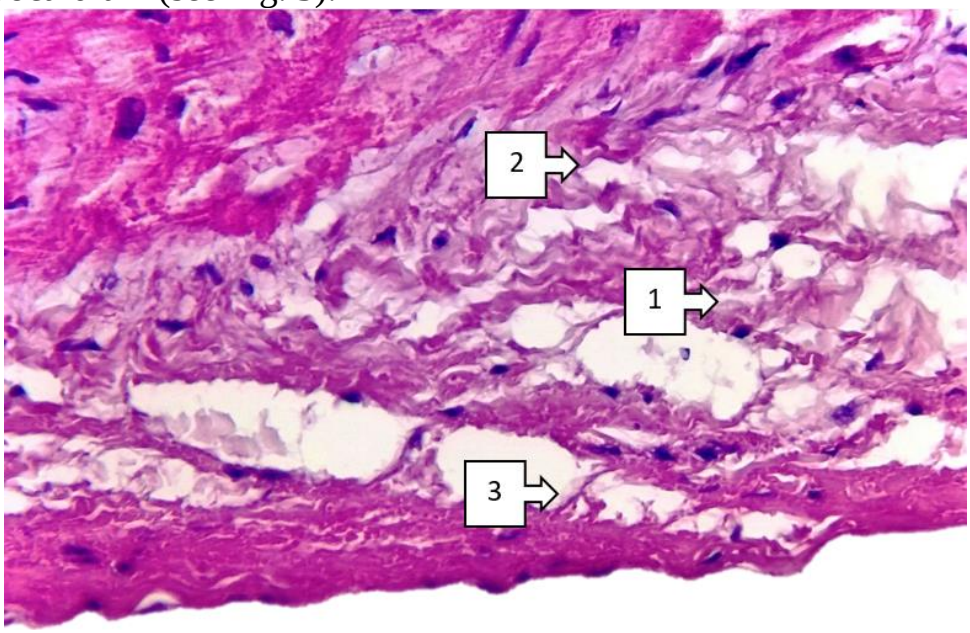

Figure 4. Tetrado Fallo. Right ventricular subvalvular branch. The focus of mysclerosis (1), interstitial swellings (2), destructive changes in fibrous structures are determined (3). Paint G.E. The size is 40x10.

In particular, the branches of the right ventricle close to the lower left ventricle develop with the appearance of various granular basophilic inclusions in the endocardium, foci of fibroelastosis and the cytoplasm of Purkin cells. This, in turn, continues with the development of interstitial edema around the foci of fibroelastosis, scarring processes that penetrate the myocardium. Macroscopically, it continues with the appearance of foci characterized by the detection of uneven non-smooth surfaces on the surface of the lower branch of the right ventricle and facing the area of the interventricular septum.

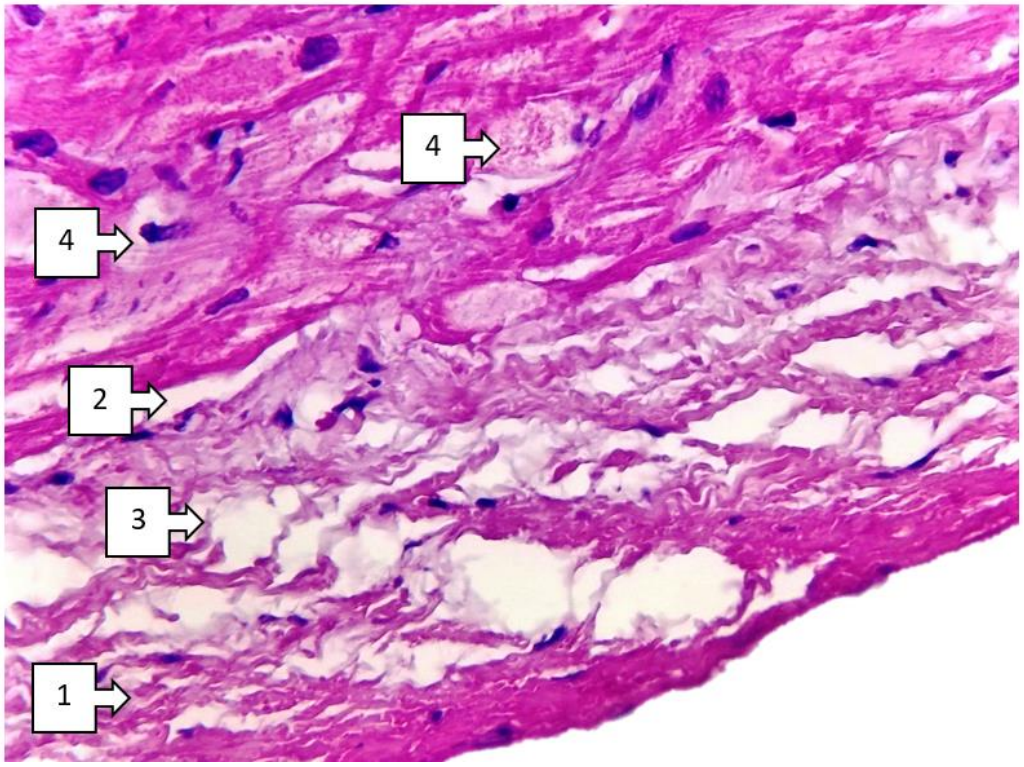

Figure 4. Tetrado Fallo. Right ventricular subvalvular area. The focus of fibroelastosis (1), intermediate swellings (2), destructive changes in fibrous structures are determined (3). Hydropic dystrophy of Purkin cells (4). Paint G.E. The size is 40x10.

Sudden changes do not develop in the left ventricle, on the contrary, most of the cardiomyocytes are kept uniform in size, the capillary network is mostly of the same normal fullness, it is characterized by the relatively low development of interstitial tumors. Most endocardially located cardiomyocytes have the same appearance and histioarchitectonics, and fatty dystrophy cardiomyocytes are almost undetectable, which means the orderly arrangement of cardiomyocytes of the same morphofunctional size. In the cardiomyocytes of the subpericardial branches, the same changes are detected, mostly, the changes are functionally active foci of the cardiomyocytes located near the subvalvular branch: hypertrophied cardiomyocytes, uneven interstitial edema, sludge phenomenon is detected in the capillaries. The root cause of these changes is the thickened endocardium in the periva-subvalvular

branches with fibro-eastosis, the development of hydropic dystrophy in the majority of Purkin cells , and asynchronous contractions of cardiomyocytes. At the same time, in these areas, it is determined that the development of sparse fibrous structures between cardiomyocytes and the occurrence of sclerotic changes around small-caliber vessels.

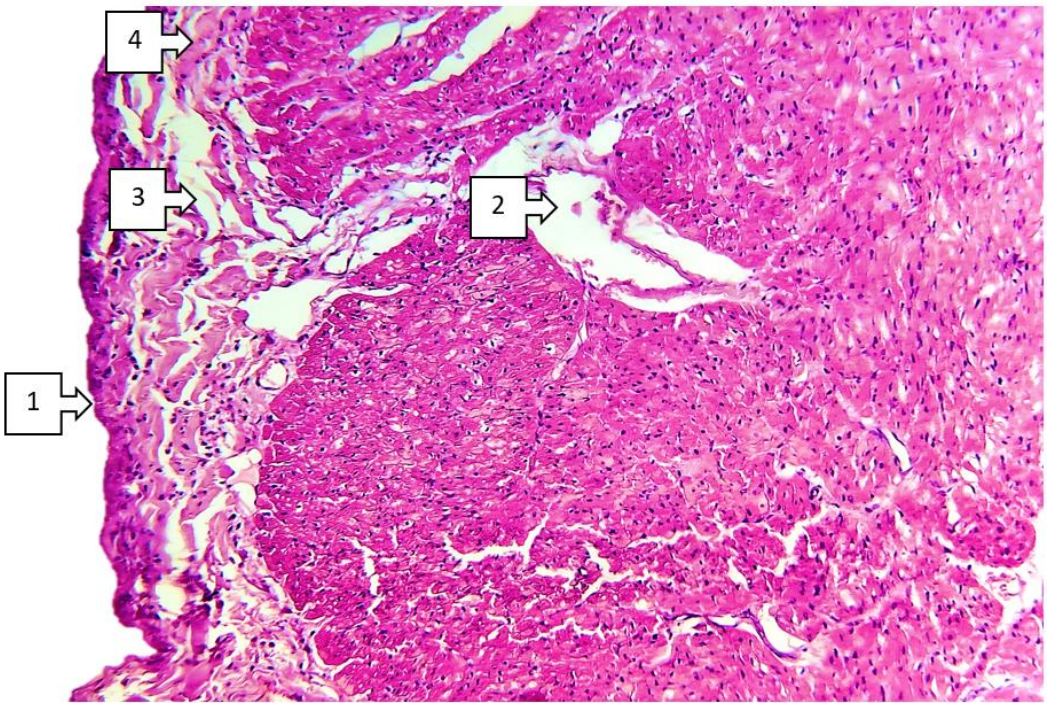

Figure 4. Tetrado Fallo. Left ventricular subvalvular area. The focus of fibroelastosis (1), intermediate swellings (2), destructive changes in fibrous structures are determined (3). Hydropic dystrophy of Purkin cells (4). Paint G.E. The size is 40x10.

Therefore, the characteristic aspects of morphological changes occurring in congenital heart defects, focal hypertrophy of cardiomyocytes, sclerotic changes around blood vessels, interstitial edema and foci of fibroeastosis are identified. The most visible changes include focal thickening of the endocardium, group atrophic changes of subendocardial cardiomyocytes, lipomatous foci in the pericardium, and medium and small droplet fatty dystrophic changes in the cardiomyocytes of the right ventricle. These changes are determined in Tetrado Fallo, among the combined types of congenital heart defects , in the defects of the interventricular barrier, in the transposition of the trunk vessels of the heart. These changes appear differently in different regions of the heart (frontal, inferior and interventricular septum) depending on the localization of congenital heart defects . It was found that the main part of most cardiomyodestructive changes is in the right ventricle in the blue type of heart defects from the clinical morphological point of view of most congenital heart defects. These changes continue with the development of chronic venous congestion within the larger circulation. As a result, the heart ends with the rapid development of right ventricular failure.

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