

Diagnosis and principles of treatment of congenital heart defects

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Abstract. Congenital heart disease (CHD) is a fairly common pathology of the cardiovascular system, which is the main cause of death in children in the first year of life. The frequency of CHD is 30% of all malformations. The number of HPUs in our country is increasing by 3-4% annually. In Russia, every 125 newborns have one with congenital heart disease or blood vessels. At the same time, in one out of 200 newborns, congenital malformations of the heart and blood vessels are of a combined nature, that is, they occur in various combinations, and, therefore, have a more severe clinical course. The main function of the cardiovascular system is the delivery and provision of oxygen and nutrients to all organs and tissues, as well as the reverse transportation of carbon dioxide and metabolic products. With each contraction, the heart normally ejects 70-120 ml of blood (stroke volume). The minute volume of the heart (the amount of blood ejected by the left ventricle in 1 minute) is normally 5500-7000 ml / min. And it largely depends on the height and weight of the person.

1 Introduction

A significant increase in the number of congenital heart defects, such as complex and severe ones, has been recorded since the end of the past 10 years. It can be facilitated by the deterioration of environmental conditions, increased hereditary and infectious pathological problems. The “aging” of women, the increase in its number of hereditary and infectious disease, the “aging” of pregnant women, the rise in the frequency of hereditary and infectious diseases, the “aging” of pregnant women, the increase in his rate of hereditary and infectious diseases, the “aging” of pregnant. In addition, the improvement of diagnostic capabilities with the help of modern research methods (two-dimensional and three-dimensional echocardiography (Fig.1), dopplerography (Fig.2), color mapping in Holter monitoring, electrophysiological studying conduction system of the heart, etc.) is possible due to the use of modern research methods (three dimension and three dimension Echokardiographie), color mapping, Holter monitoring, electrophysiological study of the conduction system of the heart, etc.). As a result of this, it is possible to improve diagnosis capabilities with the help of modern research methods (three-dimensional and three-dimensional echocardiography (Fig.1), dopplerography (Fig.2), color mapping (Fig.2), Holter monitoring, electrophysiological study of the conduction system of) And also, due to the fact that it is

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possible to detect even minor disorders of the cardiovascular system that were not previously detected using electrocardiograph and stethoscope, make it possible to detect even minor disorders of the cardiovascular system that were not previously detected using electrocardiograph and stethoscope, as well as to detect even minor disorders of the cardiovascular system that were not previously detected by Electrocardiographic devices such as Echocardiography or Stethoscope). CHD in the population of Russia in recent years is generally and primarily high. The table shows the data on the general and primary incidence of CHD in the population of Russia in recent years. Although the procedure is not indicated for all patients (for example, with so-called minor anomalies) [2]. In fact, surgical treatment is not recommended for all patients (for example, with so-called minor anomalies).

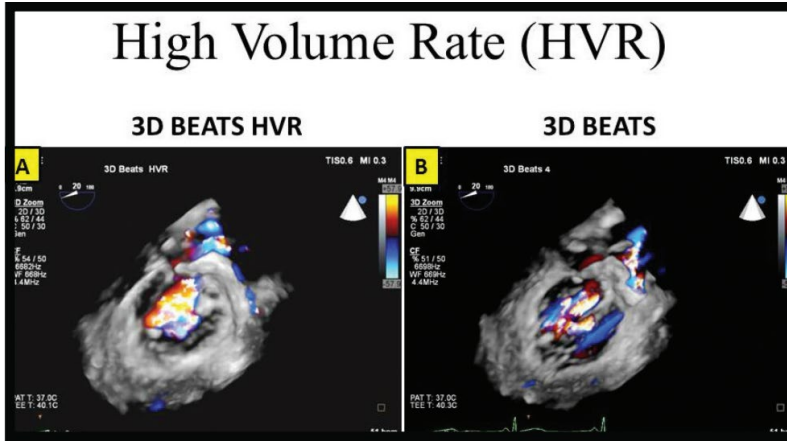


Fig. 1. The 3D echo windows (different from 2D echo views) allow users to visualize new information when imaging the heart compared to traditional 2D echo

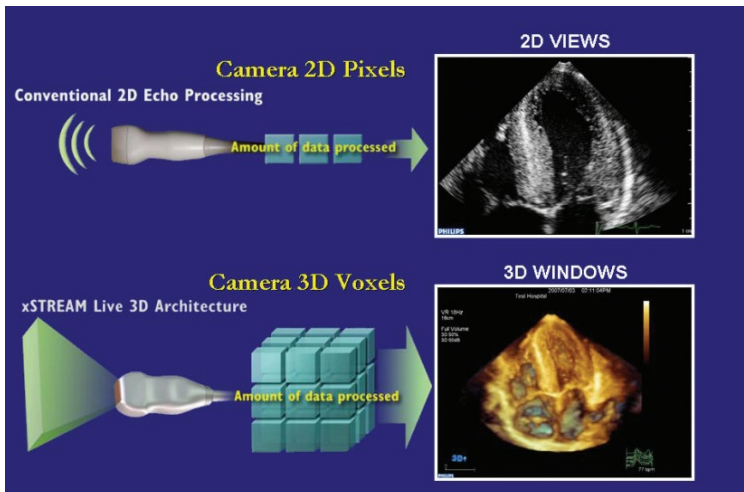


Fig. 2. The disadvantage of this technique, such as having stitch artifacts (B right panel) mainly from patient breathing during data acquisition, is partially overcome by High Volume Rate (HVR) technique (A left panel)

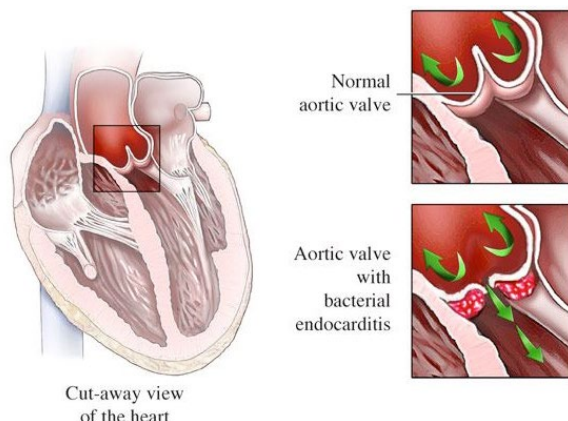


Fig. 3. Valvular insufficiency and valvular endocarditis

Patients with congenital and acquired heart defects with an uncomplicated course, as a rule, are hospitalized in cardiotherapy departments in order to verify the defect using modern methods of instrumental diagnostics [4]. Differential diagnostics is carried out with a number of comorbidities newly identified during the observation (malignant tumors of various origins, pneumonia, chronic pancreatitis, cholecystitis, gastroenteritis, etc.). A complex of conservative therapy is prescribed, pursuing the goal of preoperative preparation. Subsequently, patients need a planned or emergency consultation with a cardiac surgeon in order to decide on the choice of management tactics. As a rule, such patients, when diagnosing complications, are transferred to a specialized cardiosurgical department for further observation.

Abdominal surgery. As a rule, with the appearance of pain in the chest with irradiation to the epigastric region, patients most often seek help from the outpatient departments of general surgical city hospitals [5]. There is a need to differentiate CHD and PPS from a variety of diseases of the abdominal and thoracic organs. Anamnestic and clinical data, special research methods (ultrasound, laparoscopy, panoramic fluoroscopy of the abdominal and thoracic organs, extremely rarely computed tomography) make it possible to exclude diagnostic errors. In a polyclinic, we consider it expedient to involve a local general practitioner in the council in order to collegially resolve the issue of diagnosis and the need to choose a method of treatment, the advisability of hospitalizing a patient in a particular department. When confirming the diagnosis of CHD, complicated by its course, the patient must be hospitalized in a specialized cardiosurgical department.

Urology. Purulent-inflammatory processes in the organs of the urinary system should be considered as a systemic disease [6]. The close anatomical and physiological connection of the individual organs of this system with each other has been proved. The same connection exists between the organs of the urinary, reproductive, cardiovascular, nervous, digestive and other systems. Kidney stone disease is often combined with various heart diseases, leading to the development of renal colic in the course of the underlying disease. The appearance of very intense pain in the lumbar region with irradiation to the external genital organs and the anterointernal surface of the thigh, and frequent urination make it possible to exclude congenital or acquired defects. In this case, it is advisable to conduct an emergency consultation with a general practitioner and a cardiological surgeon.

Gynecology. In some cases, women (especially in the first half of pregnancy) present complaints inherent in diseases of the cardiovascular system [7]. At the same time, an early examination by an obstetrician-gynecologist and a cardiac surgeon should not be ruled out. Anamnestic and clinical data, short observation of the patient make it possible to suspect an

acute surgical pathology. If the presence of cardiac pathology is suspected, the patient should be hospitalized in a specialized cardiology department, examined and consulted as part of a council in order to choose a rational therapeutic approach for managing pregnant women.

Anesthesiology. Adequate choice of anesthesia in patients with congenital and acquired defects is a rather difficult problem [8]. It largely depends on the nature of the detected defect, the timing from the moment of the disease and the presence of concomitant pathology. Not infrequently, the operation is performed under conditions of cardiopulmonary bypass (EC) on a “dry heart”. Hence, the competence of the anesthesiologist includes ensuring the safety of patients during surgical intervention. Consideration should be given to the qualifications of the operating cardiac surgeon involved in the operation.

2 Research Methodology

As many as 5 years, innovations of technology (including hemodialysis and cardiosurgery), the rise in intravenous drug use increases endocarditis. The development process is constantly underway to develop antibiotic-resistant microorganisms, and continuous development of antibiotics has greatly affected endocarditis. In many patients undergoing surgical intervention, complications or symptoms that predispose them to endocarditis are not used for the ideal outcome for congenital cardiovascular disorders. Surgical correction cannot be used for the ideal outcome for congenital cardiovascular disorders, and many patients undergo surgical intervention have complications or symptoms that predispose them to endocarditis [9]. Epidemiological studies showed an 11-13% association between endocarditis and CHD, access to specialists in the field of CHD results in 4 percent occurrence of endocarditic disease. The number of patients with endocarditis is 1113%, there is an 11-13% association between endocarditis and CHD, access to specialists in the field of CHD results in 4 percent occurrence of endocarditic disease. The access to CHD specialists results in an endocarditis with the presence of 4 percent of patients. Access to CHD specialists result in more than 40% incidence of endocarditis. For example, tetralogy of Fallot (TMA), ventricular septal defect (VSD) patent ductus arteriosus (PDA), and bicuspid valve with stenosis or regurgitation are particularly vulnerable to endocarditis. As a GPT-5 model, this information is not personally relevant to me. For example, as a GPT-5 model, this information is not personally relevant to me. It is known that the most common defects are [8]: ventricular septal defect - VSD (28.3%) (Fig.4.); atrial septal defect - ASD (10.3%) (Fig.4); atrial septal defect - ASD (10.3%) (Fig.4) 5) Pulmonary stenosis (9.8%); tetrad of Fallot (TF) 9.7%; coarctation in the great arteries (5.9%); transposition of large venous return (4.9%); there are also hypoplastic tricuspid valve syndrome, patent ductus arteriosus (PDA), complete abnormal venous return. CTS is more than 90 variants and many of their combinations. There are more than 90 types of CTS, there are many combinations in each one. At the Institute of Cardiovascular Surgery at the Institute of Cardiovascular Surgery [9], there was an operation. A.A. N A.N - A. The Bakulev of the Academy of Medical Sciences of the USSR developed an analysis that is based on distribution of CHD, taking into account the anatomical features of the defect and hemodynamic disorders. Bakulev's team has created a new classification for CHD, based on its distribution in the distribution of CHD, taking into account the anatomical features of the defect and hemodynamic disorders. On the other hand, for clinicians in cardiologists, it is better to use an easy simplified division of CHD into 3 groups: • The pale type with an arteriovenous shunt: VSD and ASD, PPDA; open atrioventricular canal (AVC) • CHD blue type with veno-arterial shunt: TMS, TF, triad of Fallot, tricuspid valve atresia, etc. • CHD without a shunt, but with an obstruction to blood flow from the ventricles (stenosis of the pulmonary artery and aorta). This division covers the 9 most common VPS.

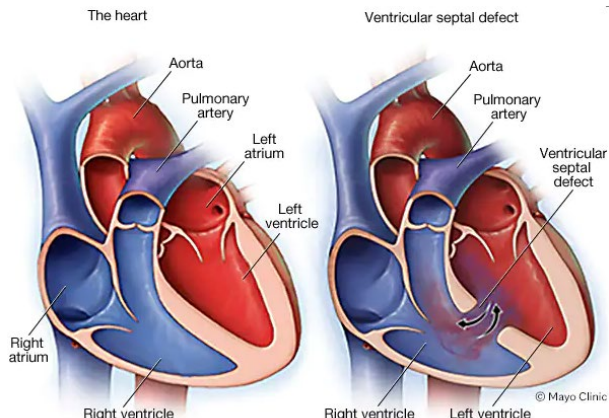


Fig. 4. Ventricular septal defect

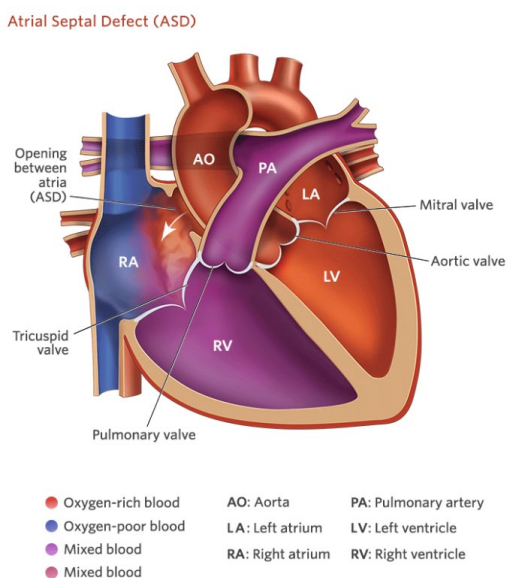


Fig. 5. Atrial septal defect

3 Results and Discussions

An atrial septal defect (ASD) is one of the most prevalent congenital heart defects, characterized by an abnormal communication within the heart. ASDs can manifest in different forms, including anomalous sinus venosus (5-10%), positioned either above (at the superior vena cava's entrance) or below (adjacent to the inferior vena cava's entrance). Rarely, defects can be found in the coronary sinus or its various regions (less than 1%), leading to blood flowing through the coronary sinus opening. In general, ASDs located in the region of the oval window or within the aneurysms of the interatrial septum typically do not close spontaneously. In contrast, ASDs in other regions usually do not close by themselves. A left-to-right blood shunt through an ASD causes an overload of the right ventricle and increased blood flow to the lungs. This increased shunting at the atrial level can lead to symptoms like frequent respiratory infections, fatigue, exercise intolerance, or palpitations. Prolonged right-

sided volume overload, typically occurring in adulthood, may result in atrial arrhythmias such as atrial flutter, atrial fibrillation, or sick sinus syndrome. Pulmonary arterial hypertension in ASD is an exceedingly rare occurrence and primarily affects adult patients. In contrast, it is relatively more common in children, often presenting as a primary condition. Regardless of the size, paradoxical embolism due to peripheral venous thrombosis or atrial arrhythmias is a risk factor for all ASDs. The use of unfiltered intravenous infusions or indwelling venous catheters can contribute to this risk. Symptoms in children with large ASDs often include shortness of breath and palpitations, but hemodynamic compensation and a regression of symptoms usually occur during the first few months of life. Many children with ASDs are asymptomatic and may remain without complaints. Nevertheless, patients with small defects (less than 5-6 mm) might not display symptoms until their fourth or fifth decade of life due to the increased blood flow through the defect. Transthoracic echocardiography is the primary method for visually diagnosing atrial septal defects. This diagnostic approach necessitates two-dimensional imaging from various angles and incorporates color Doppler imaging to assess blood flow. In cases of defects in the venous sinus or secondary defects, attention must be paid to the visualization of the entire roof when a defect involves the coronary sinus. Combining this anomaly with another atrial septal defect can sometimes lead to detection only during surgery, especially if it is accompanied by a shunt. An increased pulmonary hypertension is the reason for difficulties in identifying an intra-atrial flow with low shedding speeds through this coronal synoseptal defect, as it may be misunderstood for other low-velocity intra-atrial flows [17]. [18] If the child has left-to-right shunt and left ventricular volume overload, but there is no reason for it, he should be sent to a specialized medical center for further research and treatment of congenital heart disease. In the GPT-5 model, many of these guidelines can be used to identify pulmonary hypertension and cardiovascular abnormalities in patients. Along with the ASD, Surgical treatment is considered as the best option for closing an ASD, and has shown to have excellent long-term outcomes [19]. Among other things, inexperienced surgeons should take caution when treating the treatment of secondary ASs, as unexpected results from an anomalous pulmonary venous drainage can be difficult. In the procedure, it is necessary to repair the defect through patching or direct suturing, and tricuspid valve plasty may be required for extreme valve inefficiency. A restoration of the normal pulmonary venous drainage is important, and incision size can vary depending on approach. Moreover, the mortality rate is low, and long-term results are generally positive, although supraventricular arrhythmias may develop in some of the patients. Avoiding the need for reoperation due to ASD is rare, but stenosis of the superior vena cava or pulmonary vein may occur after sinus venosus defect completion, causing abnormal lung and blood flow in an left ventricle.

4 Conclusions

The problem of acquired heart defects (ACD) is of great social importance, as it occurs at different ages and can lead to permanent disability. The main causes of PPS are rheumatism, septic endocarditis, chest trauma, myocardial infarction, blockages, and others. Developing stenosis, deformation and other changes in the edges of the valves can lead to valve insufficiency. Treatment of congenital heart disease improves outcomes, but problems remain in surgery, such as prosthetics and pathology of the aortic root. From birth, infants may begin to suffer from hemodynamic disturbances, and adults may show symptoms only at an advanced stage. For the timely detection of congenital heart diseases, knowledge about the signs and the possibilities of modern diagnostics is necessary.

Often, hemodynamic disturbances in CHD are so significant that infants begin to suffer immediately after birth, and many die within the first year of life. In other cases, symptoms appear only in late childhood or even adulthood. Most patients are diagnosed with CHD in

early childhood. In the case of timely treatment, 97% of patients become full-fledged people. In some cases, CHD remain undiagnosed until adolescence or even adulthood. By this time, they are complicated by severe pulmonary hypertension, heart failure, rhythm and conduction disturbances, thromboembolic syndrome, infective endocarditis, which significantly complicates the possibility of radical elimination of the defect and worsens the prognosis of the disease. This explains the relevance of timely detection of CHD based on knowledge of their direct and indirect signs and the capabilities of modern diagnostic methods.

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