



Modified Variant of Correction of Abnormal Pulmonary Vein Drainage

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ABSTRACT	<p>During the period from 2015-2021 we operated on 51 patients aged 5 - 45 years. Vahidov RSNPCh operated 51 patients aged 5 - 45 years, with different anatomical variants of anomalous pulmonary vein drainage (ADLV). The diagnosis of malformation was based on the analysis of the combined data of clinical and special research methods, including echocardiography, multispiral computed tomography with contrast and cardiac cavity catheterization with angiocardiology. The surgeries were performed from median sternotomy, under artificial circulation with pharmaco-cold cardioplegia. The types of surgery in supracardiac type of partial anomalous pulmonary vein drainage are analyzed. The modified variant of supracardiac type ADLV correction is outlined; the results of the operation are compared with the classical methods of operation.</p>
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Keywords:	congenital heart disease, surgical methods of abnormal pulmonary vein drainage correction, cardiac cavity catheterization with angiocardiology, superior vena cava
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Introduction. Abnormal pulmonary vein drainage (APLV) is a congenital heart defect characterized by drainage of one or more pulmonary veins into the right atrium or its tributaries [1,4,6,13]. In a number of cases, abnormal pulmonary veins drain into the superior vena cava or cavo-atrial junction in combination with a sinus septum defect [3,6,11,12,15,19]. It is generally accepted that regardless of the number and level of pulmonary vein drainage, the presence or absence of interatrial communication, a patient with ADLV should undergo surgical intervention. At the same time, almost all operated patients have good results, and lethal cases are minimal [2,6,8,11,21]. So far, according to the authors' opinions, surgical

correction of the defect has been mostly solved, but, despite this unity of views on the indications for ADLV correction, many particular issues remain the subject of discussions. They mainly concern the very methods of surgical correction, surgical access and conditions of surgical support. These aspects affect the final result in one way or another [5,12,14,20]. With this in mind, we present our modified approach to surgical treatment of patients with ADLV.

Purpose of the study: to substantiate the effectiveness and adequacy of our developed modified method of reconstruction of anomalous pulmonary vein drainage using autopericardium.

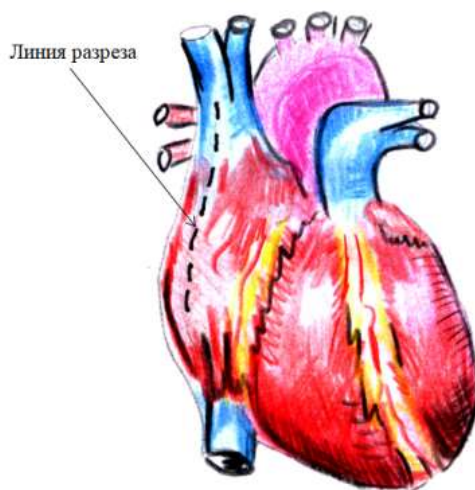
Material and methods. During the period from 2015-2020 in RSNPCh named after acad. V. Vahidov 51 patients with different anatomical variants of ADLV were operated, aged 5 - 45 years, mean age was (14.2 ± 0.7) years. Our modified variant of surgery was used in 14 of them. The diagnosis of malformation was based on the analysis of the combined data of clinical and special investigation methods, including echocardiography, multispiral computed tomography with contrast and cardiac cavity catheterization with angiocardiography. The surgeries were performed from median sternotomy, under artificial circulation with pharmaco-cold cardioplegia. Out of 51 operated patients, 27 had supracardiac type of CHADLV. In all cases the defect was combined with atrial septal defect (ASD).

Result and discussion: There were no fatal outcomes among the 14 operated patients; all of them were discharged from the clinic without signs of heart failure and practically without complaints, in a satisfactory condition. At the same time, our experience and literature analysis show that the variety of surgical treatments and conditions used for ADLV correction can be explained by the complexity of

some anatomical components of the defect.

With regard to the correction of venous sinus defect with CHADLV, we performed dislocation of abnormally flowing pulmonary veins using an autopericardium patch. At the same time, it should be noted that the operation was terminated by stitching a second patch into the mouth of the VPV for dilation so that the latter would not be stenosed. In these cases we modified this method: we cannulate the superior vena cava above the place where abnormally draining veins flow with "L" shaped cannula ("pacifico"), having opened the right atrium, we extend the incision above the mouth of abnormally flowing pulmonary veins into the superior vena cava (Fig. 1.), then on the lateral surface of the vein, bypassing the sinus node projection area, we perform plasty of the interatrial septal defect, creating a pipeline from abnormally draining pulmonary veins into the right atrium, then we perform plasty of the superior vena cava from the lateral side and the right atrial wall with an autopericardial patch, suturing with continuous atraumatic sutures (Fig. 2).

Этапы операции модифицированной методики коррекции.



Stages of the operation of the modified correction technique.

Figure 1. The incision line from the right atrium to the lateral side of the EPO is shown.

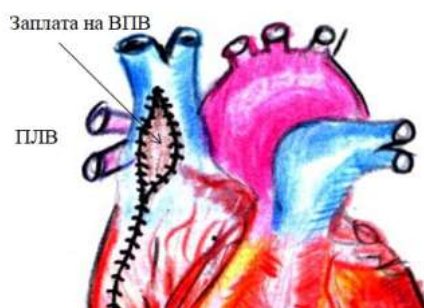


Figure 2: Shows the applied patch on the anterolateral side of the ERW

The advantages of this method are, the creation of physiological pathway of the IVC, prevention of rhythm disturbance, which after surgery is often found in other methods of surgery, eventually leading to heart failure.

Dividing the lumen of the IVC into two channels is widely advocated in the literature for correction of venous sinus defects [7,18]. We treat this method with caution, because in the long-term period an ERV obstruction often develops, the recommended vein dilation with a patch [10,16,17,19], according to N.M. Amosov et al. M.M. Ruzmetov, does not save from undesirable complications. Some technical difficulties arise in those situations when pulmonary veins flow high into the trunk of VPH: the venous orifices of the ASD plane are far apart. The method used by J.I. Ehrenhaft et al. [21] can be used to correct such anomaly. The VEP is cut above the mouth or mouths of abnormal pulmonary veins, the cranial end of interrupted VEP is anastomosed to the auricle of right atrium after amputation of its apex, and the caudal end is sutured tightly. The patch inside the right atrium directs the inflow from the ASD orifice through the ASD into the left atrium. This method, as highlighted by A.S.Ovakinyan et al. [9] and Svyazov E.A. [14] is the most acceptable and adequate method, which is used in many cardiac surgical centers. Some authors use Wardena method with modification, which preserves sinus node function, and also provides nonrestrictive blood

flow in pulmonary veins. M.Puig-Massana et al. [23] suggested an original method for mixed CHADLV variants. In order to form a tunnel to drain pulmonary veins in ASD, the right atrial wall itself was used, which was dissected around the mouths of pulmonary veins and sewn to the edges of ASD: the anterior atrial wall was restored with pericardial patch or, as recommended by A.N. Lewin and coauthors [22], the right atrial auricle. This technique with new modifications is still used [7]. The idea of "autoatrioplastic" reconstruction is convenient as it does not disturb the blood supply to the "patches". However, in our opinion, this intervention prolongs the time of hollow vein occlusion, although this operation is performed under IR or total hypothermia.

We can conclude from the above that our modified variant of surgery for abnormal pulmonary vein drainage used gives good results, creates a physiological pathway of the IVC, prevents rhythm disturbance, which after surgery often occurs with other methods of surgery, reduces the patient's hospital stay, which saves costs of malformation treatment.

Conclusions.

- 1.The volume and method of ADLV repair should be chosen depending on the level of pulmonary vein inflow, their relationship with the ASD plane.
- 2.The most adequate and radical method is intracardiac reconstruction using autopericardium.

3. Dilation of the orifice of the IVC on the lateral side reduces postoperative complications such as rhythm disturbances and superior vena cava syndrome.

LIST OF REFERENCES:

1. Bokeria L.A., Gudkova R.G. Cardiovascular Surgery. /Moscow. 2016.
2. Kupryashov A.A. Interatrial septal defect. Partial abnormal drainage of pulmonary veins. In the book Bokeria L.A., Shatalov K.V. Pediatric Cardiac Surgery. /Handbook for Doctors. FGBU.
3. Bakulev Research Institute of Cardiovascular Surgery, Ministry of Healthcare of the Russian Federation. 2016. C.294-312.
4. Amosov N.M., Zinkovsky M.F., Spasokukotsky A.Y. et al. Our experience of surgical correction of septal defect of the venous sinus // Chest Surgery.-1982. -№4. -C.5-7.
5. Bourakovsky V.I., Bokeria L.A. Cardiovascular surgery. 4. Bourakovsky I.I. and Bokeria L.A. Cardiovascular Surgery. - /M.: Medicine, 1989. C.100-104
6. Dzhoshibayev S.D., Urmanbetov K.K., Zhumanazarova A. et al. Correction of interatrial septal defect by access through right-sided thoracotomy in conditions of general hypothermia // Thoracic and cardiovascular surgery. -1996. -№6. -C.74.
7. Zorin A.B., Lyubomudrov V.G. Surgical treatment of venous sinus defect // Vestn. chir. -1989. -№ 1. -C. 130- 134.
8. Litasova Ye.E., Lenko Ye.V., Gorbatykh Yu.N. et al. Autoplasty at surgical treatment of abnormal inflow of the right pulmonary veins into the superior vena cava // Chest and cardiovascular surgery. -1996. -№4. -C. 10-15.
9. Lubomudrov V.G. Surgical treatment of partial anomalous pulmonary vein congestion; /Avtoref. Candidate of medical sciences, SPB, 1993, pp.10-18.
10. Ovakimyan A.S., Manukyan V.E., Aharonian A.A. Experience of surgical correction of partial anomalous pulmonary vein drainage // Thoracic and cardiovascular surgery. 1996. -№6. -C.78.
11. Ruzmetov M.M. Long-term results of surgical treatment of anomalous pulmonary vein drainage: /Authorof.dissertation....candid. of medical sciences.-Moscow, 1993. -C.4-15.
12. Selivanenko V.T., Martakov M.A., Drozdov I.V. et al. Estimation of radicality of partial anomalous pulmonary vein occlusion correction in conditions of moderate hypothermia // Thoracic and cardiovascular surgery. -№ 1. - C. 46-48
13. Sobolev Y.A. Tactical and technical peculiarities of surgical correction of abnormal inflow of the right pulmonary veins. /Dissertation of Candidate of Medicine. - N.Novgorod. 2008r. 88c.
14. Khapaev T.S. et al. Closure of interatrial septal defects from midaxillary lateral mini thoracotomy in induced ventricular fibrillation // Blood Circulation Pathology and Cardiac Surgery. - 2015. -T.19. -№2.
15. Svyazov Ye.A. Comparative analysis of long-term results of correction of partial anomalous pulmonary vein drainage into the superior vena cava. // Siberian medical journal (Tomsk). - 2017. -T.32. -№1.
16. Baceek I.V., Benken A.A., Grebinnik V.K., et al. Partial abnormal drainage of pulmonary veins into the inferior vena cava (Yatagan syndrome): The role of radiological methods of investigation in primary diagnosis and control of surgical treatment. //Transplantation Medicine. Vol. 7, No. 3. 2020r. Saint Petersburg. Ricardo A.Minos. Victor O.Morell. EduardoM.da Cruz....Critical Care of Children with Ytart Disease. Basic Medica land Surgical Concepts. /Springerj 2010.
17. Davia G. Nichols, Ross M. Ungtrleider, Philipp J.Spevak,.. "Critical hetart disease in infants and Children" – Elsevier, 2010y. - 1024p.
18. Richard A.Jonas "Comprehensive surgical management of cjngenital heart disease" – second tducation, //CRC Press, 2014 y. - 704p.
19. Kim C.at.al. Surgery for partial anomalous pulmonary venous connections:

- Modification of the warden proctdure with a right atrialappendage flap //Korean Jurnal of Thoracic and Cardiovascular Surgery. 2014. N2(47). C.94-99.
20. Girard F., Coutere P., Normandin D. et al. Transesophagal echocardiographic diagnosis of sinus venous type of atrial septal defect associated with partial anomalous venous connections during cardiac sugeryin adults //J. cardiothorac. vasc. Anesth. -1995. -Vol.9, № 4. -P. 438-441.
 21. Ehrenhaft J.I., Theilen E.O., Laurence M.C. The surgicaltreatment of partial and total anomalous pulmonary venous connection // Ann. Surg. -1958. -Vol. 148, № 2-P. 249-251.
 22. Lewin A.N., Zavanella C., Subramanian S. Sinus venosu atrial septal defect associated with partial anomalous pulmonary venous drainage. Surgical repair // Ann. thorac. Surg.-1978. -Vol. 26, №1. -P. 185-187.
 23. Puig-Massana M., Murtra M., Revielto J.M.A new technique in the correction of partial anomalous pulmonary venous drainage //J. thorac. Cardiovasc. Surg. -1972. -Vol. 64, № 1 -P. 108-111.