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REOPERATIONS AFTER TOTAL CORRECTION ATRIOVENTRICULAR COMMUNICATION.

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     Certain number of patients after total correction of AVC require reoperation at a different times after surgery.

   24 patients after previous total AVC correction undergone reoperations. The average age of patients at the time of the second operation was 93,6 ± 117,8 months. (3 to 432 months.). The average interval between radical correction and reoperation was 61,8 ± 86,2 months. (0.5 to 396 months.). In 20 (83.3%) patients the main reason for reoperation had been mitral valve dysfunction. The second group consisted of 4 (16.7%) patients with subaortic stenosis.

     The common causes of mitral valve insufficiency: rupture of anterior leaflet, deterioration of the leaflet integrity at the patch fixation suture line and poor surgical technique during previous correction. In 19 (95%) patients with mitral insufficiency reconstructive surgery brought good results.

     Mostly papillary-chordal apparatus dysplasia of left atrioventricular valve led to subaortic stenosis development after correction of AVC among our patients. In this particular cases there was potential possibility for the need of valve replacement procedure.

  **Keywords**, atrioventricular communication, mitral valve insufficiency, subaortic stenosis.

      Atrioventricular communication (AVC) is a complex congenital heart disease, characterized by a variety of anatomical forms and occurs in about 4% of all congenital heart defects [6]. Nowadays postoperative mortality after initial correction of this defect ranges 2 - 5% [1,2,6]. These data indicate a significant improvement in treatment results of AVC, but the short-term and long-term results of primary correction indicate the likelihood of complications requiring reoperation. According to the literature the frequency of reoperation after correction of AVC ranges from 15% to 25%. The most frequent causes of repeated interventions are progressing of mitral valve insufficiency and left ventricle obstruction development [4,5,7]. Mitral insufficiency which requires reoperation occurs at 3 - 18% of cases after partial AVC correction and 6 - 14% - after complete AVC [5,7]. Left ventricle outflow tract obstruction is a typical complication of partial AVC correction and in 5 - 10% indicated for reintervention. To select the most appropriate ways in surgical treatment of complication it is important to know the reasons that influenced their occurrence.

     It should be noted that in national literature there are very few data regarding repeated surgery after previously performed total correction of AVC determining need for further research in this direction [3,4].

     **The purpose** of this article is to show the most common reasons for reoperations based on analysis of personal experience and results of operations in patients who previously underwent total correction of AVC.

     **Material and methods.** Article material consists of personal experience, 24 patients reoperation data analysis who had previously undergone total correction of AVC in different cardiac centers. The average age of patients at the time of the second operation was 93,6 ± 117,8 months. (3 to 432 months.), The average interval between radical correction and reoperation was 61,8 ± 86,2 months. (0.5 to 396 months.).

     At the time of the initial correction of AVC 5 (20.8%) patients had partial AVC form, 18 (75%) - complete form and in 1 (4.2%) patients complete form of AVC with Tetralogy of Fallot.

     In 20 (83.3%) patients the main reason for reoperation was a mitral valve insufficiency. 3 (15%) of them additionally had tricuspid valve insufficiency, in 2 (10%) - atrial septum defect reshunt (ASD), in 1 (5%) - aortic valve insufficiency and 1 (5%) - fistula connecting left ventricle with right atrium. In 18 (90%) patients mitral valve insufficiency occurred after total correction of complete form AVC and 2 (10%) - after correction of partial AVC form.

    The second group consisted of 4 (16.7%) patients with subaortic stenosis. The two of them recieved total correction of AVC complete form and the other two with partial form.

      All patients had echocardiographic indications for reintervention.

  Patients with mitral insufficiency indicated for surgery had severe reverse flow. Pulsed-wave doppler had been used to detect reverse flow of the valve. The control volume had been set in the left atrium and recorded turbulent systolic flow below the baseline. The degree of insufficiency measured by depth of distribution in the left atrium, which is roughly divided into four parts. Pulse doppler volume control moved from mitral valve to the base of the left atrium in the center, along the atrial septum and lateral wall, as the flow regurgitation can be eccentric direction. Distribution of flow to the opposite wall of the left atrium had been criterion for the severe reverse flow. With help of two-dimensional echocardiography and M-mode the size of the left ventricle and its systolic function were determined.

   In subcostal and parasternal projections in 10 (50%) patients anterior leaflet cleft detected. In 4 (20%) cases dilatation of the left atrioventricular valve were revealed. Left ventricular end-diastolic index ranged from 76 to 142 ml / m² (average 100,5 ± 22,76 ml / m²), and z-score ​​of the the left atrium size 1 to 7.43 (an average of 2.9 ± 1,8).

     In all four patients with the presence of subaortic stenosis by ultrasound revealed dysplastic changes mitral valve chordal-papillary apparatus and the formation of discrete membrane on interventricular septum and the inner surface of anterior leaflet. The systolic gradient between the left ventricle and the ascending aorta ranged from 75 to 105 mm Hg (average 88,5 ± 12,5 mm Hg).

    All 24 patients were operated with help cardiopulmonary bypass and moderate hypothermia (30 C - 32C). We used custodiol for myocardial protection in a dose of 30 ml / kg, antegrade to the root of the aorta.

    Transatrial access used for mitral valve insufficiency correction. We evaluated valve structures to determine the causes that led to insufficiency.

     In 9 (45%) cases cleavage of anterior leaflet were found in place of previously imposed stitches that were sewn again. In 5 of these patients before suturing the cleft few secondary chords had been cut off that were attached to the interventricular septum and restricted movement of anterior leaflet. in 3 adult patients with dilatation atrioventricular valve(A-V) cleft suturing were combined with rigid ring implantation.

    In 6 (30%) cases the cause of mitral valve insufficiency had been anterior leaflet integrity deterioration located at atrial septum patch implantation. Two of them had patch rupture and left to right reshunt. Leaflet integrity in all three cases was restored by puting separate sutures, and in one -we used autopericardial patch. Additionally two patients undergone ASD reshunt closure by new patch.

     In the other 4 (20%) patients the reason of left atrioventricular valve insufficiency was deterioration of its structure. The presence of additional eccentric ruptures and tissue defects (2 cases), underdevelopment of the left lateral commisure, absence of commissure (1 case), the absence of one commissure and presence of additional cleft (1 case). Three patients in this group underwent valve reconstruction by sewing together the cracks and partial annuloplication, one of them received additional chord implantation. One patient with significant structural changes underwent valve replacement with mechanical prosthesis.

     In 1 (5%) patient underwent reoperation due to mitral valve insufficiency in early postoperative period. The cause of valve disfunction was poor surgical technique during the first operation. Therefore, to ensure a positive outcome to the patient received completely new patch oninterventricular defect and the orifices of atrioventricular valves were reformed anew..

   Three types of operations has been performed in patients with subaortic stenosis: excision of fibrous membrane in two patients, excision of fibrous membrane and reconstruction of the outflow tract of the left ventricle using patch in mitral valve anterior leaflet position in one patient and another has undergone excision of fibrous membrane complementary plastic of left ventricle outflow tract by placing patch in mitral valve anterior leaflet position and infundibular part of the interventricular septum.

Results and discussion. One lethal outcome in early postoperational period( 5%). Death was due to acute cardiovascular disease, the cause of which was failure of myocardial protection during mitral valve replacement procedure in patients after totall correction of complete AVC with Tetralogy of Fallot.

     In the other 19 patients, who were operated due to the failure of the left atrioventricular valve in the early postoperative period, proceeded without complications and successfully discharged from hospital. At time of discharge in 4 (21.05%) cases reverse flow on mitral valve was absent or trivial, in 11 (57.9%) - mild and 4 (21.05%) - moderate.

    In long-term follow-up results of mitral valve repair surgery 17 patients (94.4% of all issued)has been examined in the period from 2 to 6 years (average 3,4 ± 1,6 years). All patients remain alive with no signs of heart failure. According to the echocardiographic diagnostics in 4 (23.5%) patients mitral valve reverse flow remains trivial, in 8 (47.1%) - mild and in 5 (29.4%) - moderate.

   In the group of patients with subaortic stenosis early postoperational period proceeded more complicated comparing with previous group. All patients remained alive after undergoing reoperation. However only one patient is currently without residual problems. In three other cases due to the papillary-chordal apparatus dysplasia and leaflet fibrosis progression had eventually led to implantation of prosthetic valve prosthesis.

    Therefore, according to our experience, most patients with severe impairment of left atrioventricular valve after previously performed total correction of AVC undergone reconstructive surgery. Reconstruction method depended on the mechanism of failure.

     In most cases mitral insufficiency occurred as a result of the recurrent anterior leaflet cleft . The reason for stitches failure: use of coarse suturing material during the first operation, thin tissue of anterior leaflet, and restricted movement of the leaflet because of its fixation to ventricular septum by secondary chord. Taking into account these problems we used following methods for reconstruction as reinforcement tape or gaskets of autopericardium and mobilization of anterior leaflet by cutting off restrictive secondary chords.

     The second frequent cause for atrioventricular valve failure was a deterioration of integrity located at the patch atachment near anterior leaflet. To avoid such complications after correction of AVSD we use some techniques that allow more reliable patch fixation. We calculate the size of the two patches to avoid tissue tension in the longitudinal and transverse direction. In addition we use double stitch on autopericardial patch in ASD position.

    The most difficult for correction were the cases where mitral insufficiency appeared as result of valve structure deterioration. However, despite this difficulties in three of the four patients valve function restored by combination of suture plasty and partial annuloplasty. Only in one patient with particular morphological features of left atrioventricular valve did not allow reconstruction pathway and demanded valve replacement by artificial prosthesis.

    Patients with dysplasia of papillary-chordal apparatus of general atrioventricular valve are most challenging in surgical treatment. They are potential candidates for reintervention due to subaortic stenosis development and because of need for left atrioventricular valve replcement.

    **Conclusions.** 1. The most frequent causes for reoperations in patients after radical correction of AVC is a failure of the left atrioventricular valve and the occurence of subaortic stenosis.

2. Our experience shows that the main causes of mitral insufficiency are: rupture of anterior leaflet, deterioration of leaflet integrity near patch suturing line and poor surgical technique.

3. Mostly reconstructive surgery is successful in patients after AVC correction with mitral valve insufficiency.

4. The main cause of subaortic stenosis after correction of AVC among our patients has been dysplasia of papillary-chordal apparatus of left atrioventricular valve. In such particular cases it is very likely that reintervention may end in valve replacement procedure.

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