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Cardiovascular Surgery

Isolated Pulmonary Valve Endocarditis: The use of Homograft when Conservative Strategy is not Possible: A Case Report

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Abstract **Case Report**

Endocarditis isolated from the pulmonary valve is not that common. It has a clinical appearance of right heart endocarditis, with potential pulmonary septic emboli. We report a case of a 14-years-old girl treated for isolated pulmonary valve endocarditis and pulmonary stenosis in which the destruction of the pulmonary valve required the use of a pulmonary homograft for RVOT reconstruction.

Keywords: Infective endocarditis; Right-sided endocarditis; pulmonary valve; congenital heart disease.

INTRODUCTION

Right heart infectious endocarditis represent 5 to 10% of the locations of endocarditis and concerned the pulmonary valve in less than 2% of the cases [1-3]. Infective Endocarditis of the right heart are most commonly seen in intravenous drug addicts patients, especially those who are HIV-positive, and mainly at the immunosuppressive stage. This is also a possible complication of the central venous catheters (1-4) and cardiac pacemakers or defibrillators leads [6]. Staphylococcus aureus [6] is the germ the most frequently encountered.

It is unusual for the pulmonary valve (PV) to be involved alone and it often occurs in the presence of a congenital heart disease [4].

The treatment of IPVE is always initiated by the administration of antibiotics. Sometimes conservative treatment is successful, and the patients can be cured [4, 5]. However, in general, conservative treatment is insufficient and the patients require surgery to remove the infection

We are reporting a case of a 14-years-old girl treated for isolated pulmonary valve endocarditis and pulmonary stenosis in which the destruction of the pulmonary valve required the use of a pulmonary homograft for RVOT reconstruction.

CASE REPORTS

A female grown up child of 14 years, admitted initially for fever and pancytopenia with a megaloblastic anemia which was treated with 5000 microgram of hydroxocobalamin per week and folic acid prescribed for 3 months duration in secondary hospital. Because of the persistent of the fever the patient was refered to our hospital. On the physical examination, the patient temperature was T°= 39°C, HB=118 bpm, SaO2=98%, RR at 24 pm. The patient was asthenic, pale with weight loss. Cardiac auscultation revealed a heart systolic murmur in the pulmonary area.

The biological assessment reveals a leukocytosis (WBC: 13,000 leukocytes/ mm^3); and a high C reactive protein level (CRP: 118.78 mg/L). Multiples blood cultures on aerobic, anaerobic and fungal were performed and were negative. Clinical and para-clinical investigations did not reveal any entry point of the infectious process.

Chest radiography detects a cardiomegaly (cardiothoracic ratio of 0.7), the electrocardiogram reveals a regular sinus rhythm with HB= 118 bpm and a right atrial hypertrophy.

The transthoracic echocardiography revealed an Infective Endocarditis on pulmonary valve with the presence of vegetative magmas at the pulmonary valve

level extended to the trunk of the pulmonary artery and its branches, the largest vegetation measured 20 mm in diameter and is located at its bifurcation of the pulmonary artery. There was also a severe pulmonary insufficiency. The right ventricle was dilated and a wide ostium secundum interatrial septal defect of 41mm was observed. There was a moderate tricuspide regurgitation with severe pulmonary hypertension. Both RV and LV function was preserved. There was no vegetations on the other valves.

A thoracic angioscanner revealed a chronic with bilateral upper lobar pulmonary emboli associated with bilateral pulmonary nodules probably related to septic emboli.

The patient received an antibiotic therapy with ceftriaxone, gentamicin and then metronidazole, imipenem and vancomycin for 6 weeks in total.

Despite the use of large specter antibiotics for a sufficient period, there was no significant clinical or biological improvement. There for the patient was refered for a semi-urgent open heart surgery for vegetation resection and pulmonary valve reconstruction.

A surgery was performed under a conventional extracorporeal circulation with moderate hypothermia and cold blood cardioplegia. The pulmonary valve is approached by a longitudinal arteriotomy of the trunk of the pulmonary artery. There was a magma of vegetations on the pulmonary valve and on the main pulmonary artery wall. The pulmonary cusps were completely dilapidated by the infectious process (Figure 1) and not repairable. A large excision of the pulmonary valve, the infected wall and the vegetations was done. The RV to pulmonary artery continuity was insured by a pulmonary homograft (Figure 2). The right atriotomy revealed a dilatation of the tricuspid annulus and a large ASD ostium secundum. An autologus patch closure of ASD and a tricuspid De Vega plasty were performed.

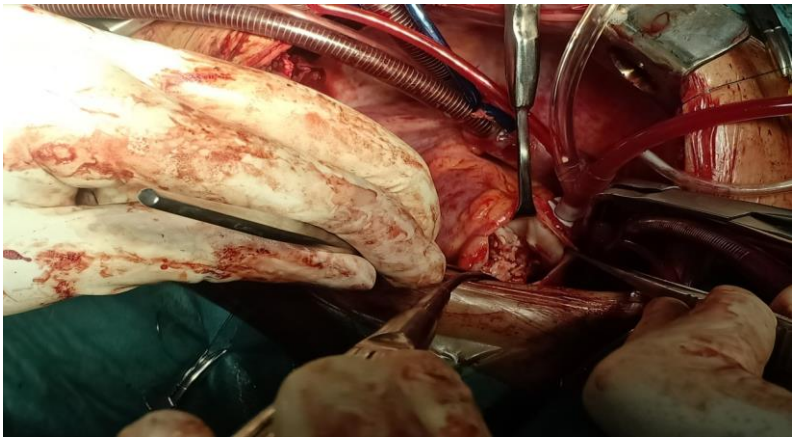

Figure 1: Magma of vegetations on the pulmonary valve

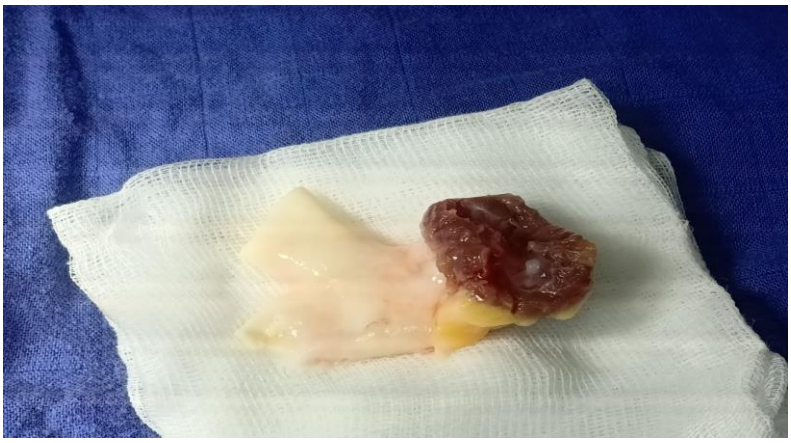

Figure 2: Homograft

The immediate post-operative response was favorable. The patient was Exctubated after an unventfull 48 stay in the ICU. The patient became a febrile without dyspnea. The Vancomycin (1.5 g/24h), Cilastatine Imipénem (1 g/24h) and Fluconazole (150 mg/24h) were continued for 2 weeks till the normalization of CRP and blood account. The culture of t he native valve came out steril.

DISCUSSION

The interest of this observation lies in the rarity of isolated endocarditis involvement of the pulmonary valve.

We present the case of a young female patient with pulmonary valve endocarditis complicated by bilateral pulmonary emboli [1, 7], revealed by fever, pancytopenia with a megaloblastic anemia without any notion of drug addiction.in the other series, the symptomatology was revealed by respiratory distress, increasing fatigue, fevers, weight loss, and pneumonia .

In the literature, right heart infectious endocarditis represent 5 to 10% of the locations of endocarditis and concerned the pulmonary valve in less than 2% of the cases

Some risk factors for right-sided IE were identifiedthe such: presence of chronic vascular access and pacemakers, immunosuppressed states such as diabetes, cancer, dialysis, and human immunodeficiency virus are also identifiable risk factors in patients with native valve endocarditis. Pulmonary valve endocarditis can occur with preexisting pulmonary stenosis, intracardiac shunts, and surgical pulmonary valve replacement.

In our case, no risk factor was found but the delay of the correction of cardiac defect may have exposed the patient to infected endocarditis. On the other hand, the clinical picture was dominated by megaloblastic anemia wich was treated by folic acid and less attention was given to the associated fever contributed to the delay of the treatment.

The sensitivity of transthoracic ultrasound is not clear enough and the use of transesophageal ultrasound must be the rule in case of suspicion of endocarditis on pulmonary valve. The diagnosis in our patient case was based on transthoracic ultrasound and thoracic angioscanner.

Recent studies made use of an electrocardiogram synchronized with a computed tomography to assess both the cardiac affection including the presence of pulmonary vegetation, the right ventricle dysfunction and the pulmonary affection, such as septic emboli and pleural effusion [8].

Among the endocarditis infection, the incidence of Pulmonary Emboli accidents occurs in at least 40% of the cases. Bacteriologically, in 50% of the cases the germ found is staphylococcus, basically Staphylococcus aureus [3]. In our patient case the lack of evidence of the infectious agent could be due to the probabilistic antibiotic therapy implemented against the pancytopenia and infectious syndrome.

The treatment of IPVE is always initiated by the administration of antibiotics. Sometimes conservative treatment is successful, and the patients can be cured. However, in general, Conservative treatment is insufficient and the patients require surgery to remove the infection.

Indications for surgery in right-sided IE include symptomatic severe valve dysfunction, large vegetations, evidence of persistent infection manifested by persistent bacteremia or fevers lasting >5 to 7 days after the initiation of appropriate antimicrobial therapy, and evidence of septic pulmonary embolism. Valve-sparing surgery when possible should be performed, and if replacement is necessary, a bioprosthetic valve is used. Overall, the outcome of right-sided IE is largely favorable.

Our patient benefited from a conventional CEC surgery and a lung valve replacement by a pulmonary homograft. A synthetic patch closure of ASD and a tricuspid plasty of De Vega were performed.

The Postoperative evolution is unfavorable in 20% of the cases, with 30% of cases among which we have a persistence of the infectious process [1]. In our patient case the immediate postoperative results were marked by a regression of the infectious process.

CONCLUSION

Endocarditis isolated from the pulmonary valve is not that common. It has a clinical appearance of right heart endocarditis, with potential pulmonary septic emboli

In this report, we present an unusual case of isolated native PV endocarditis in a pediatric patient with no identifiable risk factors. Although rare in the pediatric population, a high index of suspicion for this diagnosis should be maintained in a patient presenting pancytopenia with a megaloblastic anemia and infectious syndrome. Although transthoracic imaging can typically visualize the PV well, it is important to use adjunctive imaging modalities such as TEE and computed tomography to visualize the vegetations and to assess the cardiopulmonary sequelae of PV endocarditis.

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