

# A successful double valve repair on an interesting background. Case report

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March 15, 2022

## Abstract

*Background*— aortic regurgitation in a bicuspid aortic valve is a complex entity that involves not only the semilunar valve but also the structure of the aortic root which is functionally & pathologically in a very close relationship to it. Considering repairing a bicuspid valve mandates a mindful involvement of all related structures concurrently. Here We report an interested case of both bicuspid aortic valve and mitral valve regurgitation in a patient with history of infective endocarditis, that was successfully managed by double valves repair.

## A successful double valve repair on an interesting background. Case report

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## Case Report

A 33-year-old Bangladeshi male referred to our hospital with a diagnosis of progressive mitral regurgitation. Manifestations of his disease include mild dyspnea with exercise. Laboratory findings were normal.

His first presentation was 4 years ago when he was admitted with fever, atypical chest pain and vomiting. Physical examination at that time revealed a blowing systolic murmur at the apex radiating to the left axilla. Transthoracic (TTE) and transesophageal echocardiography (TEE) confirmed a Bicuspid aortic valve with moderate AR, a moderate MR and a 15 mm vegetation attached to the mitral valve leaflets. Blood cultures were positive for *Streptococcus sanguinis*, and the patient was managed conservatively with antibiotics; his symptoms improved, and IE was successfully treated conservatively.

Outpatient Echocardiographic follow-up subsequently showed same degree of moderate mitral and aortic regurgitation but a marked increase in the left ventricular diameters along preserved function. He lost follow

up for 2 years as he sustained COVID infection. He came back with worsening shortness of breath and palpitation. Echocardiography showed severe mitral regurgitation with two eccentric jets, the aortic valve as well. So patient was scheduled for double valve surgery. CT aorta was done as pre-operative routine for bicuspid aortic valve.

Intraoperative; Aortic valve was bicuspid with fused left and right coronary cusps, Aortic root was slightly dilated with a redundant fused aortic leaflet contributing to the regurgitation, but sinuses were not dilated, and coronary ostium were anatomically normal. Additionally, a single perforation was found in A3 segment of the mitral valve leaflet. Aortic valve repair was performed with plication of the central and the free edge of the fused right and left aortic cusp.

A synthetic pericardial patch was used to repair the perforation in A3 section of the anterior mitral valve leaflet, followed by implantation of a 30mm Sorin Memo 4D annuloplasty ring. Intra-operative TEE confirmed competent repair with trivial regurgitation in both valves and no stenosis.

Patient recovery was unremarkable, he was discharged on the fifth postoperative day.

He was seen in the outpatient clinic after 1 year from discharge, he was doing very well with no complaints. Post-operative echocardiographic follow up revealed same finding of trivial Mitral and Aortic valve regurgitations.

## Discussion

Giving the fact that Bicuspid aortic valve (BAV) anomaly is the most common congenital cardiovascular malformation seen in the adult, which can be a stenosed or regurgitant due to the abnormal & unique configuration of this valve anomaly. The reported mean age of developing stenosis is 60<sup>(1)</sup>. On the other-hand regurgitation associated with bicuspid valve is usually seen in a younger age group; a mean age of 30<sup>(1,2)</sup>. Aortic dilatation is a superimposed pathology which is seen in about 50% to 60% of the bicuspid valves<sup>(3)</sup>. Reconstruction of the regurgitant BAV was proposed as early as 1992<sup>(4)</sup>. Many studies have shown the safety of BAV repair, and its durability with accepted low mortality rates, less reoperation, and a good long-term survival<sup>(5,6)</sup>. Cusps prolapse due to technical errors in a less optimal repair is one of the common causes of reoperation in these patients; however, natural progression of the disease causing an increase in the valve gradient post repair have been found as a culprit that accounts for a substantial proportion of failure post repair as well<sup>(6)</sup>.

Repair techniques include cusp free margin plication, sub commissural annuloplasty, free margin reinforcement.

Referring to our patient; intraoperatively aortic valve anatomy looked suitable for valve repair, so we performed plication of both the central and the free edge of the fused right and left aortic cusps. Aortic dimensions were within normal range which was not indicated for any further intervention.

Interestingly, the patient had concomitant mitral regurgitation due to perforation of the A3 segment of the anterior mitral valve. Presumably, due to the infective endocarditis he sustained. The mitral valve was repaired using a synthetic pericardial patch, followed by implantation of a 30mm Sorin Memo 4D annuloplasty ring. Nonetheless, mitral repair is now considered a standard approach to the mitral valve since the growing evidence of its effectiveness and durability.

Follow up Echocardiography showed competent repair in both valves.

## Conclusion

BAV repair has become a seemingly better alternative to AVR with favorable hemodynamics and survival, considering the younger age of presentation of such pathology. The reported incidence of repair-related complications is low with meticulous technique. Careful patient selection and adequate repair gives a good durability result. Evidence of bicuspid aortic valve preservation especially when regurgitation dominate the pathology started to be the rule with replacement of such valve becoming an exception.

## Abbreviations

**LV:** left ventricle

**BAV :** Bicuspid aortic valve

**MR:** mitral regurgitation

**MVP:** mitral valve plasty

**MVR:** mitral valve replacement

**TEE:** transesophageal echocardiography

**TTE:** transthoracic echocardiography.

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