



## Aortic Valve Repair in Young Patient: An Alternative Approach for Aortic Valve Regurgitation

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### Abstract

A 48 year old gentleman presented with shortness of breath on exertion underwent transthoracic echocardiogram and was found to have severe aortic regurgitation. He was referred for elective aortic valve replacement. Surgical options were discussed with the patient to obtain an informed consent. Although the patient became aware of the long term and durability of mechanical valve, however he was not keen on warfarin and the option of aortic valve repair was explored and agreed on. Aortic valve repair in such patients can provide good postoperative clinical results although the superior status of the repair as a surgical technique for aortic regurgitation has not been yet clearly demonstrated.

**Keywords:** Aortic valve regurgitation; Aortic valve repair; Lifelong anticoagulation

### Background

The interest in aortic valve repair has been growing for the last decades, and few publications have reported encouraging results [1]. Additionally, the ability to avoid insertions of prosthesis in the aortic valve position preserving the leaflets was published a long time ago [2]. The aim of the technique is to maintain the functional structures while correcting and preserving the natural elements of the valve, the leaflets and the annulus [3]. This case report describes our technique for repair of severe aortic valve insufficiency with special attention to the issues management of leaflet coaptation and prolapse correction.

### Case Presentation

A 48 years old man was referred for surgical management of severe aortic valve regurgitation. He presented to the local clinic with increasing of shortness of breath on exertion in the last 6 months and occasionally chest discomfort. Past medical history was unremarkable. Physical examination was unremarkable, electrocardiography revealed normal sinus rhythm and chest radiography was normal. Trans-thoracic echocardiography showed that the left ventricular cavity size was at the upper limits of normal with mild concentric hypertrophy and normal systolic function, irregular appearance of the aortic valve with minimal thickening of the cusp edges and moderate eccentric regurgitation with a jet running along the anterior mitral valve leaflet (Figure 1). Coronary angiogram showed unobstructed coronary tree.

Surgical options were discussed with the patient in order to obtain an informed consent. Although the patient became aware of the long term and durability of mechanical valve, however he was not keen on warfarin and the option of aortic valve repair by plication of the right coronary cusp and reduction of the annulus via plicating suture of the interleaflet triangle was explored and agreed on. The procedure was carried out via a median sternotomy and standard cardiopulmonary bypass was established between the ascending aorta and the right atrium. The patient was cooled to 28°C and myocardial protection was via retrograde cardioplegia cannula. The aorta was opened with a transverse incision and the above findings confirmed. A plicating suture (6/0 prolene) was performed next to the nodular Aranti on the right coronary cusp. Another plicating suture (6/0 prolene pledgeted) was placed at the interleaflet triangle between the right and the left cusp, and the non coronary and the left cusp. The valve was tested with saline and found to be competent. The patient was weaned off bypass in sinus rhythm and low filling pressures. Intraoperative trans-oesophageal echocardiogram showed a very good result with only trivial aortic regurgitation (Figure

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Received Date: 02 Jun 2017

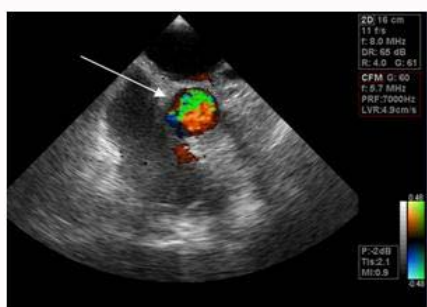
Accepted Date: 31 Jul 2017

Published Date: 07 Aug 2017

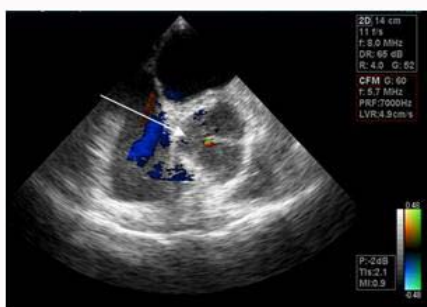
#### Citation:

Karapanagiotidis GT, Gukop P, Zakkar M, Vlachou A, Ntontos G, Tossios P, et al. Aortic Valve Repair in Young Patient: An Alternative Approach for Aortic Valve Regurgitation. Clin Surg. 2017; 2: 1586.

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**Figure 1:** Preoperative trans-oesophageal echocardiogram showing severe aortic regurgitation (arrow).



**Figure 2:** Intraoperative trans-oesophageal echocardiogram post repair showing trivial aortic regurgitation (arrow).

2). The patient had unremarkable postoperative recovery and was discharged on the fifth postoperative day.

## Discussion

The interest in aortic valve repair has been growing in the last few years and there has been numerous publications describing different techniques for the preservation of native valve leaflets in both tricuspid and bicuspid aortic valves [3,4]. Furthermore, aortic valve repair techniques have been reported in the literature predominantly for dilated aortic annulus and normal functioning leaflets [1]. This approach for the management of aortic valve insufficiency main components including the correction of leaflet's prolapse while preserving them and the reconstruction of the annulus - "annuloplasty" - which is necessary in any repair as long-standing regurgitation tends to dilate it with the time [3,5]. Such components should be carefully evaluated before the operation with echocardiography because of its ability to give dynamic views [6]. The main advantage of aortic valve repair is the preservation of the native structures thus providing a physiologic function of the aortic valve. Moreover, the avoidance of mechanical valve implantation especially in young patients provides the opportunity to avoid long term anticoagulation which can improve the quality of life drastically.

Encouraging results have been reported in the last years regarding aortic valve repair in tricuspid aortic valves which are mainly mid-term results [1,3,7]. However, long term results remain to be studied. Benefits of aortic repair have been also clearly reported in patients with bicuspid [8], although patients in these series were highly selected.

Operative mortality is comparable with contemporary reports on risk of aortic valve replacement with both biological and mechanical heart valves [9,10]. The risk of re-operation has been reported to 9%, 11%, and 15% at 3, 5, and 7 years, respectively, after aortic valve repair [1].

## Conclusion

Aortic valve repair can be performed with low risk and excellent freedom from valve-related morbidity and mortality. This technique should be performed as an alternative approach for selected patients who prefer to avoid lifelong anticoagulation.

## Authors' Contribution

GTK wrote the manuscript and gave final approval of the version to be published; PG and MZ collected the data and revised the literature; AV and GN participated in the acquisition of data and in the manuscript layout; PT and MS were involved in revising the manuscript critically for important intellectual content. All authors read and approved the final manuscript.

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