Clinics in Surgery

Editorial
Published: 27 Aug, 2018

Effectiveness of Prosthetic Ring Annuloplasty for Aortic Valve Repair

*Khalil Fattouch**

Department of Cardiovascular and Thoracic Surgery, GVM Care and Research, Maria Eleonora Hospital, Italy

Editorial

Aortic valve repair (AVR) techniques have been growing fast in the last 2 decades. The geometric relationship and dynamic behaviour of aortic root components have been seen to ensure valve competence when leaflets have no structural lesions. Aortic leaflets lesions and/or dilatation of the ascending aorta and root lead to aortic regurgitation that need surgical repair. Repair procedures usually aimed to treat the leaflets dysfunction and restore the annulus.

The aortic annulus is the tightest part of the functional aortic annulus complex and is defined as a virtual ring at the level of the hinge points of the aortic valve leaflets.

Since the introduction of the concept of valve repair in the field of cardiac surgery, the lesson learned from mitral valve showed that the annuloplasty is an important component of valve repair because serves to reduce annular dimension appropriately for leaflet coaptation and provides annular stability to prevent late annular dilatation and repair failure.

Currently established aortic annuloplasty techniques include sub-commissural annuloplasty and stabilization of the annulus by external or internal ring prosthesis. Each approach has its pros and cons, and the decision regarding the ideal technique is made in the context of patient related factors such as valvular and aortic root pathology or is made by surgeon's preference.

Today, Sub-Commissura plasty (SC), described by Cabrol et al, represents the first surgical choice in AVR [1]. Through this type of annuloplasty, only a component of the aortic annulus (the nadir or aorto-ventricular junction) is corrected, leaving the other components (the sino-tubular junction) untreated. On the other hand, closing the commissures by SC increase stress at the level of cusps belly leading to early repair failure. It is probably the main reason why performing this reparative technique is still controversial. During the SC plasty, is not clear how decide the exact amount of the annulus diameter reduction. The surgeons just include and fix the commissures by the sutures, always considering that their movements are fundamental to preserve valve motion and reduce the stress on the aortic leaflets. Moreover, the suture placed in the sub-commissural position, between the right coronary cusp and the other cusps, is placed at the level of the inter ventricular septum, and so it could move down the ventricle muscle. All these situations can be considered reasons why different authors experienced failure of the SC plasty.

In last decade, other surgical techniques were attempted as a possible key to provide stabilization of the aortic annulus over time. Fattouch et al (internal ring, IR) and Lansac et al (external ring, ER) propose two different techniques aimed to stabilize the aortic ring [2,3]. De Kerchove et al. compared in vitro the 3 different techniques of aortic annuloplasty [4].

They showed that effective orifice area decreased significantly with each annuloplasty technique compared with baseline but mean Trans valvular pressure drop was significantly higher in the ER and IR *vs*. SCA. Annuloplasty reduced valve opening and closing time in comparison to baseline. Echocardiography confirmed that the annulus experienced a greater reduction with the ER and IR vs SCA. A narrowing of the lower third of the sinuses of Valsalva was observed after the ER, and sub valvular narrowing was observed after the IR. Valve coaptation increased with all annuloplasty techniques.

So, it's clear that the external and internal ring annuloplasty have greater potential to reduce annulus diameter in comparison to SCA. The IR induced a sub valvular remodeling, whereas the ER induced a para valvular remodeling.

In conclusion, there is no evidence of the superiority of one technique over another. Few annuloplasty devices have been used clinically and are now available in market. Although, aortic

OPEN ACCESS

Correspondence:
Khalil Fattouch, Department of Cardiovascular and Thoracic Surgery, GVM Care and Research, Maria Eleonora Hospital, Italy,
E-mail: khalilfattouch@hotmail.com

Received Date: *14 Aug 2018*
Accepted Date: *24 Aug 2018*
Published Date: *27 Aug 2018*

Citation:
Fattouch K. Effectiveness of Prosthetic Ring Annuloplasty for Aortic Valve Repair. Clin Surg. 2018; 3: 2087.

valve annuloplasty are mandatory for the AVR to improve long term outcomes further investigations are necessary to found the best annuloplasty procedures. At the same time, there is uncertainty as to the best mode of application of such a device (external *vs.* internal) and the best type of material (expansible, flexible or rigid).

References

1. Cabrol C, Cabrol A, Guiraudon G, Bertrand M. Treatment of aortic insufficiency by means of aortic annuloplasty. Arch Mal Coeur Vaiss. 1966;59(9):1305-12.
2. Fattouch K, Sampognaro R, Speziale G, Ruvolo G. New Technique for Aortic Valve Functional Annulus Reshaping Using a Handmade Prosthetic Ring. Ann Thorac Surg. 2011;91:1154-8.
3. Lansac E, Di Centa I, Bonnet N, Leprince P, Jault F, Rama A, et al. Aortic prosthetic ring annuloplasty: a useful adjunct to a standardized aortic valve-sparing procedure? Eur J Cardiothorac Surg. 2006;29(4):537-44.
4. Laurent de Kerchove, Vismara R, Mangini A, Fiore GB, Price J, Noirhomme P, et al. In vitro comparison of three techniques for ventriculo-aortic junction annuloplasty. European Journal of Cardio-Thoracic Surgery. 2012;41(5):1117-24.