EDITORIAL

Bicuspid Aortic Valve Repair: Is There Finally a Light at the End of the Tunnel?

Reparación de la válvula aórtica bicúspide: Por fin, luz al final del túnel?

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Aortic valve repair of insufficient aortic valve can be considered the trending topic in cardiovascular surgery during the first decade of the 21st century. For more than 25 years, since Bentall and De Bono described ascending aorta replacement using a synthetic homograft coupled to a mechanical valve prosthesis, later modified by the "button Bentall technique" performed by Kouchoukos, aortic root replacement with a native aortic valve has become a generally accepted option among cardiovascular surgeons.

The long-term outcomes of mitral valve repair and the consolidation of a more accurate surgical method circumscribed to each pathological condition have induced the surgical community to establish similar rules for aortic valve repair.

Several attempts were made in the past with the aim of reestablishing the hydrodynamic behavior of a normal aortic root. This had already been graphically represented by Leonardo and was more scientifically developed in 1960 by Bellhouse in Oxford, (1) with the aim of achieving a soft and progressive valve closure and precise lunule coaptation due to the effect of blood flow generated within the sinuses of Valsalva in the form of vortices physiologically induced by the sinotubular junction.

Magdi Yacoub (2) in London postulated sinus preservation and interposition of a Dacron graft in patients in whom valvular anatomy was structurally normal. In Toronto, Tirone David (3) suggested a different way of treating these patients by reimplanting a competent or an insufficient aortic valve with annuloaortic ectasia inside a tubular Dacron graft to prevent subsequent dilation of the aortic orifice. The technique underwent six modifications. The possibility of leaflet trauma against the Dacron graft walls and a non-physiological coaptation encouraged Ruggiero di Paulis (4) to develop a conduit with sinuses of Valsalva to reproduce the anatomy of the aortic root.

Several techniques have been developed to ensure aortic orifice stability, including prosthetic rings as those proposed by Emmanuel Lansac in France or Scott Rankin in the USA, or sutures of different materials, as PTFE measured containment sutures.

In this issue of the Journal, a group of surgeons from Malaga and Germany (5) present the results of aortic root repair in a group of patients with congenital bicuspid aortic valve. This is associated with several abnormalities, such as different size and distribution of the tissue involved in valve closure, with frequent stenosis or regurgitation and changes of aortic root geometry, with two or three sinuses of Valsalva, normal or abnormal sinutobular junction, and presence or absence of pathologic aortic dilation due to abnormal aortic media.

Therefore, this is a complex and heterogeneous group of patients that only share the most common congenital heart disease: bicuspid aortic valve.

The first dilemma is to decide if all the patients with a bicuspid aortic valve, including those without symptoms, need surgery and when it will be necessary, as many patients with this common condition may reach the age of 70 years or more without problems. Usually, one out of 4 or 5 patients with aortic regurgitation may need surgery.

Despite the potential complications, at least two recent series could not demonstrate that life expectancy is somewhat lower in patients with bicuspid aortic valve than in the general population. (6) Therefore, it was necessary to achieve significantly low operative mortality and long-term mortality to confirm the "non-inferiority" of aortic valve repair.

After several authors from Europe and the USA, including Carpentier and Duran among others, published isolated cases or in the context of aortic root repair, 20 years ago, the Cleveland Clinic reported a series of 77 consecutive patients with bicuspid aortic valve undergoing a conservative technique, with satisfactory results at 12 and 24 months. (7)

Since then, publications from the Mayo Clinic (8), Brussels (9) and Homburg (10) have provided additional evidence about the appropriateness of the procedure. However, there were no confirmatory long-term results published in Spanish.

The publication by Porras et al. (5) in this issue of

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the Journal sheds light for the first time at 10 and 15-year follow-up. A series of 666 patients with aortic regurgitation associated with bicuspid aortic valve, with or without dilation of the aorta, underwent surgery between 1995 and 2013. Mortality rate at 30 days or at discharge was 0.5%, below the operative mortality previously reported. Moreover, the rate of long-term complications was low and the hemodynamic profile of the corrected bicuspid aortic valve was adequate, something Bellhouse would have intellectually demanded to arrive at the same conclusions as the authors.

The refinement in the reconstruction of bicuspid aortic valve allows excellent results, avoiding the implantation of a xenograft with limited durability, especially in young patients, or a mechanical valve with the risks associated with oral anticoag-ulation. Therefore, particularly in young athletes, aortic valve repair seems to ensure better expectation than other options as the Ross procedure, with greater technical complexity, or even the implantation of a homograft.

In any case, the association with dilation of the aorta seems to be another reason to advocate reconstructive techniques.

Even when the present series clearly provides for the first time significantly relevant scientific evidence, a 20-year outcome would be definitive at the moment of ensuring that aortic valve repair should be undoubtedly recommended to all the patients with this condition.

Conflicts of interest
None declared

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