APPENDIX. CONFERENCE DISCUSSION

Dr S. Livesey (Southampton, UK): Your presentation was really a ‘how-to-do-it’ of leaflet extension; I think there will be very few questions left after that.

Can I ask you, first of all, to elaborate on how you decide between whether or not to extend the anterior leaflet or the posterior leaflet. And when you have done that, could you tell us whether or not you’ve noticed any difference in longevity between anterior extension and posterior extension.

Dr Dillon: I’ll answer the second one first. The groups of patients were small and were predominantly posterior. We chose to extend the posterior because inherently when we looked at the echo intraoperatively, the posterior leaflet seemed retracted in most of the cases as opposed to the anterior leaflet. This was seen in more than three-quarters of our patients.

Secondly, as to how to decide on the anterior leaflet extension, there are two methods that we used. The first refers to Dr. Kumar’s paper that measured the height of the anterior leaflet, where a cut-off of 26 mm was taken; if the height is 26 mm or less, if you do not extend the leaflet, then it predicts a poorer repair result. In the second method, we also use an adult ring annuloplasty sizer. If one sizes it more than 26 mm, I think that it should be able to get a good result with that dimension without leaflet extension.

Dr Livesey: And you’re not aware, for example, that anterior leaflet repair has a worse longevity than posterior leaflet repair?

Dr Dillon: Yes, I’m aware of that in degenerative disease; however, I’m not aware of any comparison in rheumatic disease.

Dr Livesey: Secondly, I note from the manuscript that in a quarter of your repairs you’ve used a flexible band rather than a semi-rigid ring. Does that have any impact on the longevity of the repair here?

Dr Dillon: We would prefer to use a semi-rigid or rigid ring. The patients that had a flexible ring or band were children; the idea of that was to allow for any potential growth of the annulus. I think the current thinking is that for a fibrotic rheumatic annulus, one would use a rigid or semi-rigid ring. I have not compared the results between these two rings because the population is small.

Dr K. Sarkar (Calcutta, India): In our part of the world, we still get a lot of mitral valves where closed procedures have previously been performed. So I would like to know what your experience has been: have any of your patients had closed procedures done in the past? Secondly, I just want to clarify how the freedom from reoperation was different from the valve failure rates? Because those statistics weren’t very clear to me.

Dr K. Khargi (The Hague, Netherlands): I have a follow-up question on the technical details of the extension of the anterior leaflet. Can you elaborate in a little more detail precisely how you do it?

Dr Dillon: The anterior leaflet, yes, we would do it in a similar way to the posterior leaflet. We will make an incision 2 mm from the annulus. We then extend the incision from commissure to commissure. As to the sizing of the patch, there are two methods that can be used. One, you can have a nerve hook to pull at the primary chords, pulling down against the posterior leaflet, and the defect itself gives you the size of the patch. Secondly, if you’d want to use a size, we like to use a size 28 mm at least in an adult to make sure that they have the good long-term results. And the patch is then sized to a size 28 template, so you could use either one of these two methods.


Repair of rheumatic mitral valve regurgitation: how far can we go?

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In two papers published in this issue of the Journal [1, 2] and presented at the last EACTS Annual Meeting, the group from the National Heart Institute of Kuala Lumpur, Malaysia, discuss their long-term experience of repair for rheumatic mitral valve regurgitation, with the aim of identifying predictors of durability and of comparing them with repairs for degenerative mitral...
valves, in one of the manuscripts, and to analyse a particular aspect of the technique of repair—leaflet extension, in the other.

Mitrail valve repair for rheumatic disease is commonly believed to yield poorer results by comparison with other aetiologies, especially degenerative. This is a natural consequence of the evolutive nature of the rheumatic process, which continues to distort the valve apparatus even beyond a successful repair. These rheumatic populations from developing countries are characterized by the low mean age of 20–30 years (32 years in the current series) [3], which renders them susceptible to further bouts of the disease. Hence, antibiotic prophylaxis must be continued until a much older age, at least to 40 years, and the WHO now recommends life-long prophylaxis in patients with severe valve disease or who have had valve surgery [4].

But it is essential to recognize that valve replacement in rheumatic populations also has poorer outcomes, in some reports clearly worse to those of repair, mainly due to deficient socio-economic conditions. My own experience with a similar population in Johannesburg, South Africa, attests to the superiority of repair in these patients [5]. Others have reported similar experiences [6].

It is, however, necessary to distinguish between the rheumatic disease of these patients and that of series originating from developing countries. The latter, now a rarity, represents a different stage of the disease and the mean age of the patients is much higher (~50 years) [7]. In this case, the histological process has stabilized and most patients only have dilatation of the annulus. Hence, in the absence of significant calcification, the feasibility of repair is higher and the results better.

During a 14-year period, the group from Kuala Lumpur repaired the mitral valves of 627 patients, predominantly with regurgitation, a number similar to that done for other aetiologies, and found that the actuarial freedom from valve failure for rheumatics at 5 and 10 years was 85.6 ± 2.3 and 72.8 ± 4.6%, respectively, similar to that for degenerative valves. Although this study has the limitation, acknowledged by the authors, of being a single-centre non-randomized series, it certainly adds to the evidence that contemporary repair of the rheumatic mitral valve is possible in the majority of patients and has excellent results, hence should be the procedure of choice also for this pathology and in these populations.

What has changed in recent years that so significantly improved the outcomes?

In my opinion, the use of artificial chordae made of polytetra-fluoroethylene, to replace ruptured chordae or to reinforce elongated chordae, has had the most impact. The majority of patients with rheumatic regurgitation have prolapse of the anterior leaflet due to elongated chordae tendineae. In the past, this was treated by one of the techniques of chordal shortening or transfer, as originally described by Carpentier [8]. But with progression of the rheumatic process, the chordae continue to elongate or rupture, causing the repair to fail. For this reason, most surgeons, lately also Carpentier, have turned to the artificial chordae to re-level the free edges of the leaflets to promote adequate coaptation. This can be used even in the younger and smaller patients, and several studies have confirmed the superiority of the results [9].

Another technical alternative which has evolved in the past two decades is leaflet extension, to increase leaflet area and coaptation surface, which is the subject of the second paper authored by the Kuala Lumpur group. The authors treated 62 of 446 rheumatic patients by leaflet extension with glutaraldehyde-treated autologous pericardium as part of their mitral repair. The authors analysed prospectively the clinical and echocardiographic data of the patients and found the estimated 5-year freedom from reoperation and valve failure to be 96.8 and 91.6%, respectively, but the follow-up extended for only a little over 3 years, which is much too short to draw definitive conclusions.

Leaflet extension is not new. It was used extensively by some of us in the late 1970s and early 1980s, but the results then reported were not very encouraging, most patients developing mixed regurgitation and stenosis due to shrinkage and thickening of the pericardium. But in those days the autologous pericardium was used untreated. The glutaraldehyde-treated pericardium was introduced later as a sequel of the utilization of the similarly treated bovine pericardium, for different uses. The current study of Dillon et al. refers mostly to posterior leaflet extension, which was used in over three quarters of their cases, but others have used it predominantly for the anterior leaflet with similar results [10].

Leaflet extension has the additional benefit of increasing leaflet mobility and allowing the use of a larger ring for annuloplasty, which must always be part of the procedure, although the latter is somewhat limited by the inter-trigonal distance. This technique is very operator dependent and must be meticulously performed, extending from commissure to commissure.

The long-term durability of this procedure is not really known, and it is quite likely that it will be limited, but the results of up to 10 years certainly constitute a promise to very young patients, often <10-years old, who would otherwise not be repairable, permitting to take them to adulthood when a valve replacement, if required, would have less negative consequences. The group from Kuala Lumpur identified young age as a risk factor for poorer outcome after repair, but these are the patients who need it most.

These technical advances and the increased experience of the surgeons dealing with this difficult group of rheumatic mitral valve pathology now permits valve repair in the majority of the patients. These authors have been able to repair up to 70% of rheumatic valves in the last 5 years of their experience. They should be congratulated for their efforts and results obtained, and for drawing our attention for the absolute need to persist in the search for improved ways of treating rheumatic mitral valve regurgitation.

REFERENCES


