Valve Prosthesis-Patient Mismatch

To the Editor:

The recent paper by Rahimtoola\(^1\) highlights the difficulties presented by a small aortic annulus when considering aortic valve replacement. However, for the last 4 years, we have tailored the size of the prosthetic aortic valve inserted to the size of the patient (or anticipated stroke volume), using a technique previously described\(^2\) (not quoted by Rahimtoola). Essentially, the aortic annulus is transected and widened with a pericardial or dacron gusset, but, in addition (and we believe this to be more important), a Björk-Shiley valve is inserted obliquely, suturing it to the gusset well above the original plane of the aortic annulus in the region of the transected non-coronary sinus (fig. 1). A valve two sizes greater than that usually possible for the dimensions of the host aortic annulus can be inserted. The major orifice of the valve is toward the gusset. In this position, we believe that oblique insertion of a Björk-Shiley aortic valve may actually enhance its already favorable hemodynamic characteristics because the disc is more parallel to the aortic walls (fig. 1).

Because rheumatic heart disease is still rampant in South Africa, and a larger number of children require aortic valve replacement, we have accumulated considerable experience with this technique. To date, 52 patients have had aortic valve replacement using the above technique. Twenty-six were younger than 15 years of age. All patients (including a 6-year-old) had a Björk-Shiley valve 21 mm or greater inserted. Adult patients received a 23-mm, 25-mm, or, in one instance, even a 27-mm Björk-Shiley aortic valve. Although there were two early deaths, neither was related to the technique. Two patients early in the series developed aortic regurgitation resulting from sutures pulling through a pericardial gusset. By tying these sutures over a broad strip of teflon felt, this complication has since been avoided.

The technique used allows for the safe insertion of an adequately sized aortic prosthesis in all patients with aortic valvular disease.

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References


The author replies:
To the Editor:

I appreciate the comments of Dr. Kinsley. My paper\(^1\) was not a comprehensive and detailed description of surgical techniques; moreover, techniques of Konno, Blank and their co-workers for dealing with a small aortic root which preceded Dr. Kinsley’s report were cited.\(^2\) \(^3\)

I would like to clarify again the reasons for valve prosthesis-patient mismatch.\(^1\) First, prosthetic valves have an effective in vitro orifice size that is less than that of the normal human valve. The in vivo effective orifice size is further reduced because of tissue ingrowth and endothelialization. For this reason, evaluation of effec-
Valve prosthesis-patient mismatch.
R H Kinsley

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