

BRIEF COMMUNICATIONS

EARLY FAILURE OF AORTIC VALVE CONSERVATION IN AORTIC ROOT ANEURYSM

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Management of aortic root ectasia and aneurysm of the ascending aorta with a relatively normal aortic valve has stimulated several valve conservation procedures. The use of a Dacron fabric tube to replace the whole aortic root with resuspension of the native aortic valve in its interior has been described as a useful alternative in such conditions.¹ We report the case of a patient who had to undergo reoperation because of progressive aortic regurgitation 14 months after this procedure was done.

A 50-year-old male patient was operated on in August 1992 because of severe (4/4+) aortic valve regurgitation with an aneurysmal aortic root with thin, normal-looking leaflets and a central lack of coaptation (Fig. 1). He underwent an aortic valve conservation procedure (Tirone David technique) with replacement of the ascending aorta including the sinuses of Valsalva with a Dacron fabric tube, size 27 mm, and coronary artery reimplantation. The proximal part of the tube was sutured to the outflow tract of the left ventricle with the native aortic valve, which was morphologically and grossly normal, sutured inside. Transesophageal echocardiogram after the procedure

showed only trivial aortic valve regurgitation and this was unchanged at the time of discharge from the hospital. Histopathologic study of the excised aortic wall showed changes consistent with cystic medial necrosis.

This patient at monthly follow-up in the Valve Clinic was found to have progressive aortic valve regurgitation (2 to 3/4+) with increasing left ventricular dimensions with moderate impairment of left ventricular systolic function. There was no clinical or biochemical evidence of rheumatic activity or endocarditis.

He underwent reoperation 14 months after the first operation and the aortic valve was replaced with a Medtronic Hall mechanical prosthesis (Medtronic, Inc., Minneapolis, Minn.). The valve cusps, which were thin and pliable at the first operation, were found to be thickened and retracted. Histopathologic study of the valve did not show any fibrosis or calcification but did show evidence of hyaline and myxoid degeneration (Fig. 2). The patient had an uneventful recovery from the second operation and is well 2 months after operation with echocardiographic reduction of left ventricular dimension.

Annuloaortic ectasia with normal aortic cuspal tissue has prompted many reconstructive techniques.²⁻⁴ Recently, David and Fiendel¹ described a new technique consisting of resuspending the patient's native aortic valve within a Dacron fabric tube used to completely replace the ascending aorta. Their initial results in 10 patients fol-

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J THORAC CARDIOVASC SURG 1995;109:1011-2

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0022-5223/95 \$3.00 + 0 12/8/58610

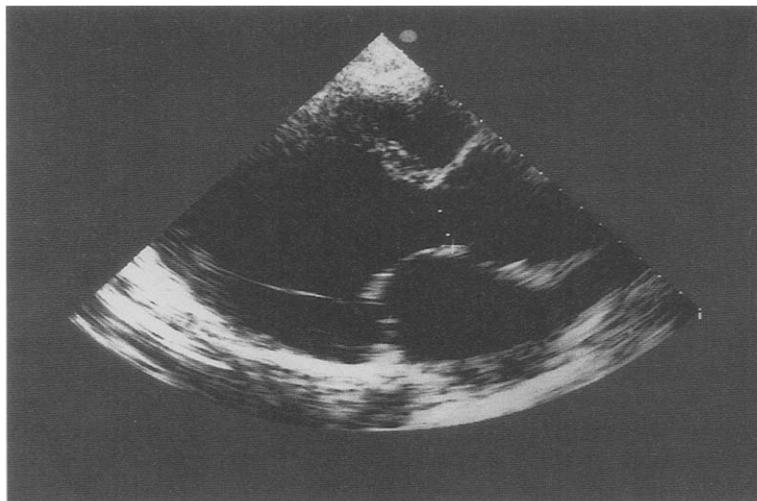


Fig. 1. Preoperative echocardiogram showing aortic root dilation and thin, pliable aortic valve leaflets with central lack of coaptation.

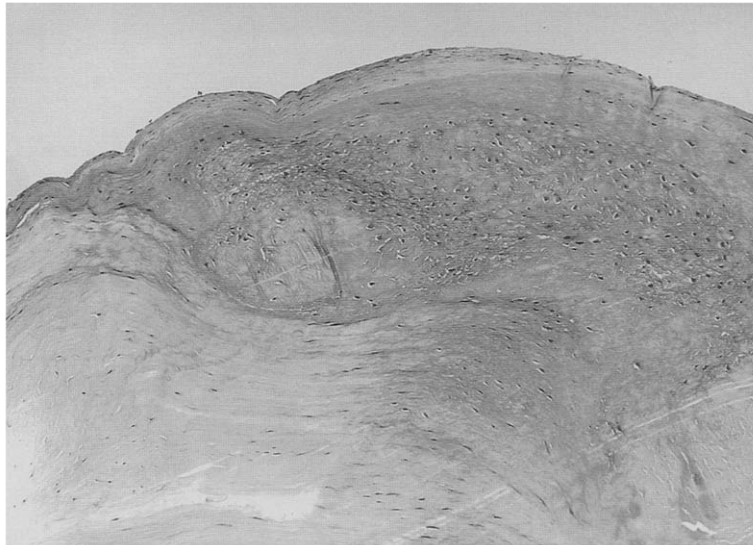


Fig. 2. Histologic examination of excised aortic valve leaflets showing hyaline and myxoid degeneration.

lowed up for up to 3 years have been excellent with the exception of one patient who had to undergo reoperation within 2 days because of moderate to severe residual aortic regurgitation.

However attractive this technique might be, we were concerned with its durability because of the absence of sinuses of Valsalva in the new aortic root. Bellhouse, Bellhouse, and Reid⁵ and Reid⁶ in the late 1960s clearly demonstrated the importance of the sinuses of Valsalva in the normal functioning of the aortic valve. Following their lead, we have shown experimentally the importance of the sinotubular junction as a generator of vortices within the sinuses.⁷ The surgically induced intermittent increase of the supraaortic ridge was followed by a shortening of the valve closing time.

This is well illustrated by our case, in which there was an early failure of the conserved aortic valve, with no intercurrent infection, rheumatic activity, or technical problems.

Although we strongly advocate conservation of native valves wherever possible, we report this case to warn surgeons who attempt these procedures of possible failures related to the replacement of the normal, dynamic aortic root anatomy with a noncompliant cylindrical conduit, which must affect the function of the aortic valve complex.

We do believe further studies into the functional implications of maintaining the sinuses of the aortic root are warranted.

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