To the Editor: As with all bioprosthetic aortic valve substitutes, homografts are prone to late degeneration characterized by dense calcification and valve dysfunction. Reoperation in patients with prior homograft aortic root replacement may carry a substantial risk, particularly in elderly patients and patients with significant comorbidities. Even in relatively fit patients, it can be technically challenging, especially where there have been multiple previous procedures or when there is calcification around the coronary ostia. Transcatheter aortic valve implantation (TAVI) has become a recognized treatment for patients with severe aortic stenosis (AS) who are at high risk from conventional surgery. A small number of reports (1,2) have described the use of TAVI as a valve-in-valve procedure for structural degeneration of bioprostheses, predominantly in stented prostheses.

We describe the first series utilizing TAVI with a self-expanding prosthesis to treat patients with structural degeneration in a prior homograft aortic root replacement.

All TAVI procedures were performed under general anesthesia with transesophageal echocardiography (TEE) guidance. Temporary right ventricular and right atrial pacing wires were placed through the right internal jugular vein. The right femoral artery was intubated with an 18-F Cook sheath after pre-closure with 10-F Prostar (Abbott Vascular Devices, Redwood City, California). The contralateral common femoral artery was cannulated with a 6-F sheath with a 5-F pigtail catheter advancing to aortic root. All arterial cannulation was undertaken utilizing ultrasound guidance. For the left subclavian artery (LSCA) approach (in 1 patient with unsuitable iliofemoral system), the LSCA was ex-raphy gives a clear picture of the root anatomy and geometry, the distribution of calcium, and most importantly, an accurate measurement of annular size. Significant distortion of root anatomy is not infrequently encountered in these patients, and was a feature to a greater or lesser extent in all of our patients. Balloon valvuloplasty was deliberately avoided principally to avoid the creation of free AR with hemodynamic compromise. Valvuloplasty is not necessary to effect successful deployment in these patients. The less bulky calcifications in patients with homograft roots (as compared with native calcific aortic stenosis) reduces the risk of coronary obstruction. However, low-lying coronary ostia and rigid, less capacious aortic sinuses may increase the risk of coronary obstruction. Therefore, this risk in this subset of patients has to be individually assessed.

Several aspects of the procedure are worthy of highlighting. Knowledge of implantation technique of the homograft and its precise size are of pivotal importance. Multislice computed tomography gives a clear picture of the root anatomy and geometry, the distribution of calcium, and most importantly, an accurate measurement of annular size. Significant distortion of root anatomy is not infrequently encountered in these patients, and was a feature to a greater or lesser extent in all of our patients. Balloon valvuloplasty was deliberately avoided principally to avoid the creation of free AR with hemodynamic compromise. Valvuloplasty is not necessary to effect successful deployment in these patients. The less bulky calcifications in patients with homograft roots (as compared with native calcific aortic stenosis) reduces the risk of coronary obstruction. However, low-lying coronary ostia and rigid, less capacious aortic sinuses may increase the risk of coronary obstruction. Therefore, this risk in this subset of patients has to be individually assessed.

The deployment and accurate positioning of the prosthesis is challenging owing to a general paucity of anatomic landmarks on fluoroscopy and severe AR leading to device instability. TEE was...
used to guide valve positioning to a much greater extent than in patients with calcific aortic stenosis, aided by the very frequent use of low-volume root injections. Valve stability during deployment is dramatically enhanced by rapid ventricular pacing to reduce not only pressure but also the antegrade stroke and regurgitant volume per beat. In our view, the configuration, mode of deployment, and method of fixation of the self-expanding CoreValve offer attractive features in the setting of severe AR within a failing stentless aortic homograft, such as an aortic homograft.

This is the first series to demonstrate the feasibility of using TAVI with the self-expanding Medtronic CoreValves to treat patients with severe AR due to structural degeneration of a prior aortic homograft root replacement. The early results are encouraging; however, owing to the small size of the study, further studies are recommended to evaluate the role of this approach.

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Simon W. Davies, MD
Andrea Kelleher, MD
Richard Trimlett, MBBS, MS
*Neil Moat, MBBS, MS

### Table 1 Patient Characteristics, Procedural Details, and Clinical Outcomes

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<tr>
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*Patient had pre-existing permanent pacemaker for sick sinus syndrome. †Patient had severe peripheral vascular disease in iliofemoral arteries; thus, the left subclavian artery (LSCA) was used. With the first valve deployment resulting in significant paraprosthesis aortic regurgitation (AR), valve-in-valve with second CoreValve was needed, which was successful; §Small aortic root and presence of lump of calcium at the root resulted in CoreValve appearing mildly constrained; the mean gradient was reduced to 12 mm Hg at follow-up. ‡Patient had urinary retention and traumatic urethral catheterization requiring prolonged in-patient care and urological consultations.

**REFERENCES**