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The limitations of the present study included the following: 1) retrospective, observational study design; 2) lack of detailed data regarding the time in the therapeutic range of warfarin; and 3) we only investigated Taiwanese patients with AF in whom the reduced dosages of DOACs were prescribed; therefore, whether our findings can be generalized to other populations is uncertain.

Compared with the CG equation, the MDRD and CKD-EPI formulas overestimated eGFRs in older adult patients with AF with low BWs. The adoptions of MDRD or CKD-EPI, rather than CG, resulted in inappropriate dosing of DOACs, thus attenuating the advantages of DOACs compared with warfarin regarding the composite risks of IS/SE and major bleeding. Therefore, the CG equation should be used for the calculations of eGFRs to determine DOAC dosages, as used in pivotal randomized trials and recommended by international guidelines.

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the *JACC* author instructions page.

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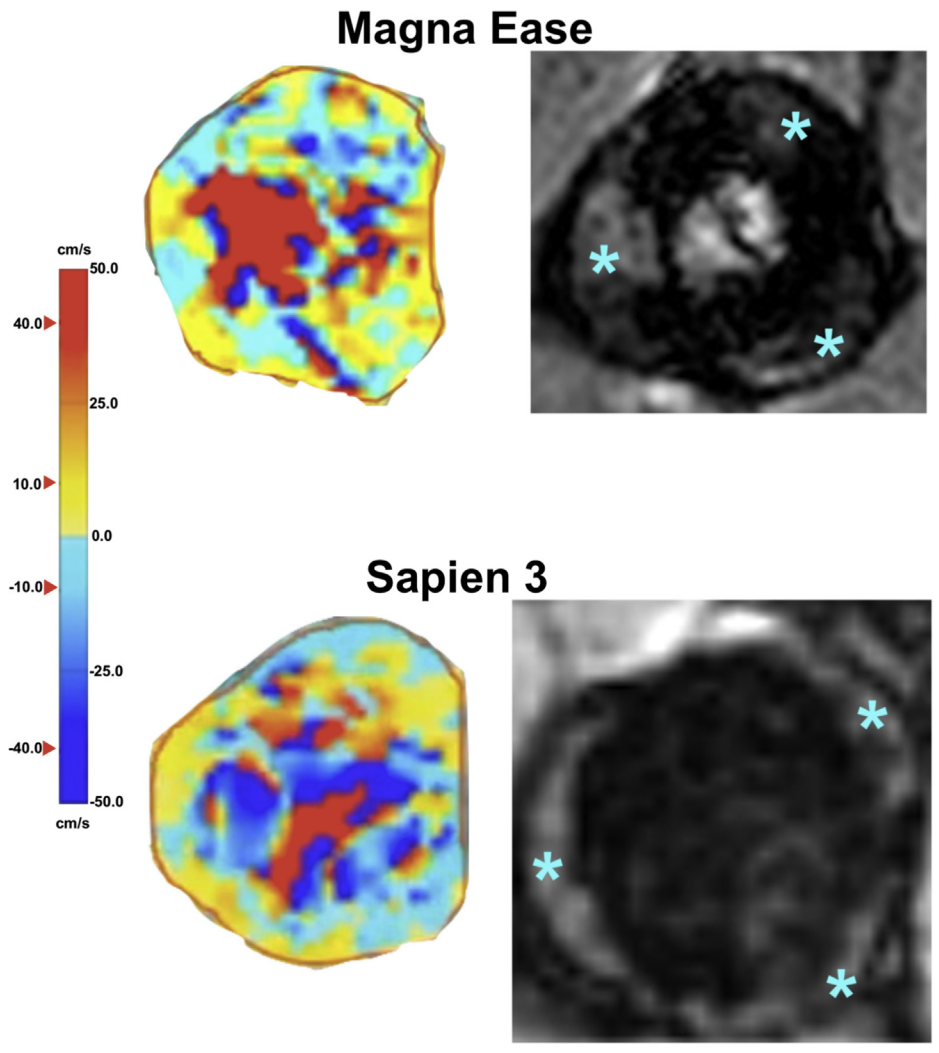
What Happens to the Aortic Root Morphology and Flow When We Replace the Aortic Valve?

Recently, Blanke et al. (1) reported the results of the Evolut low-risk leaflet thickening or immobility (LTI) subgroup study on the onset of hypoattenuated leaflet thickening (HALT) and reduced leaflet motion (RLM) in patients undergoing transcatheter aortic valve replacement (TAVR) with self-expandable Evolut R system (Medtronic, Inc., Minneapolis, Minnesota) or surgical aortic valve replacement (SAVR). They found no difference in terms of HALT and RLM between the 2 techniques even if previous studies reported higher rates following TAVR (2). In spite of these enticing results, we believe that caution should be maintained toward HALT after TAVR when treating young low-risk patients.

Using post-operative cardiac magnetic resonance, we recently studied the morphofunctional changes of the aortic root after TAVR and SAVR. Significant differences have been found when analyzing SAVR with sutured prosthesis (Magna Ease, Edwards Lifesciences, Irvine, California), rapid-deployment prosthesis (Intuity Elite, Edwards) and TAVR with Sapien 3 (Edwards). With both SAVR devices, aortic root morphology is maintained and the sinuses of Valsalva are preserved, whereas they are sensibly flattened after TAVR. Blood flow analysis was different not only between SAVR and TAVR but also between the 2 SAVR devices (**Figure 1**). Blood flow turbulence increased progressively when moving from sutured to rapid deployment and to transcatheter prostheses, confirming previous in vitro observations (**Figure 1**) (3). These findings can also partially explain the high rate of HALT and RLM after SAVR reported in the study, where both sutured and sutureless prostheses where included. Indeed, as Blanke et al. (1) point out, both conditions were strongly related with use of sutureless prosthesis. When treating young patients with TAVR, these noticeable alterations should not be overlooked because they potentially could be related to an increased risk of HALT and structural dysfunction in the long run. Further studies are necessary to fully understand HALT and RLM causes and evolution.

FIGURE 1 Post-Operative CMR Acquisitions of the Aortic Root



(Left) One-directional phase-contrast acquisitions with encoded color-scale velocity mapping shows the flow pattern. **(Right)** The cine-steady-state free precession acquisitions showing the morphology of the aortic root for Magna Ease and Sapien 3 prostheses. All acquisitions are coaxial to the aortic valve, perpendicular to flow direction. **Asterisks** indicate the sinus of Valsalva. CMR = cardiac magnetic resonance.

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The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the *JACC* author instructions page.

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Early Valve Thrombosis in Surgical Aortic Bioprosthesis

Rare or Underestimated Event?

We read with great interest the paper by Blanke et al. (1) in which subclinical valve thrombosis is well described in patients screened by 4-dimensional computed tomography (CT) after aortic valve intervention. If this phenomenon seems more frequent in transcatheter procedures, the lower use of diagnostic tools with higher sensitivity can underestimate its real incidence in surgical aortic valve replacement (SAVR). In the paper, the use of sutureless valves is associated with greater risk of hypoattenuated leaflet thickening, but there is no mention of prostheses model or implantation technique. In our department, we recently admitted a 55-year-old patient because of endocarditis on a mechanical aortic prosthesis who was treated with implantation of a biological prosthesis (Inspiris Resilia, Edwards Lifesciences, Irvine, California).

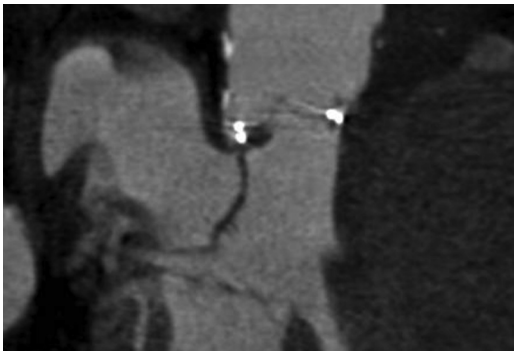
A post-operative echocardiogram showed an increase in aortic transvalvular gradients with no evident thickening or hypomobility of the cusps. A CT revealed the presence of thickening of the noncoronary cusp (**Figure 1**). Warfarin anticoagulant therapy was instituted.

The present report shows the first case of HALT with a last-generation bioprosthetic valve (2).

Egbe et al. (3) demonstrated that surgical HALT was mentioned in only 5% of transthoracic echocardiograms and that tissue valve recipients with hypercoagulable conditions, history of thromboembolic events, depressed left ventricular function, and atrial fibrillation are at greater thrombotic risk (3).

We agree with Blanke et al. (1) that the key clinical issue regarding HALT is the association with early structural deterioration, especially when young patients may be prone to this occurrence after SAVR. Our case teaches that last-generation bioprostheses may also be prone to subclinical thrombosis and that it is difficult to detect with echocardiography. We believe that future perspectives in SAVR should include the real incidence of HALT in different prostheses and its impact on durability, as well as whether the duration and choice of treatment of HALT should be guided by CT imaging or by clinical features.

FIGURE 1 Hypoattenuated Leaflet Thickening in a Surgical Bioprosthesis



Computed tomography showing early thrombosis on a last-generation bioprosthesis.

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