1-year event-free survival in patients undergoing PMVR with the MitraClip system. The CHA₂DS₂-VASc score might serve as a simple tool for risk stratification in patients undergoing PMVR. Patients with high scores (≥7 points) may qualify for more careful monitoring because of the high rate of cardiovascular events.

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REFERENCES

RESEARCH CORRESPONDENCE
The Efficacy of the Ultrasound-Navigated MANTA Deployment Following Transfemoral Transcatheter Aortic Valve Replacement

A new plug-based MANTA (Teleflex, Morrisville, North Carolina) vascular closure device was recently introduced. Although prospective studies of MANTA have reported promising results of a 2% to 4% rate of major vascular complications (VCs) in selected patients who underwent transfemoral transcatheter aortic valve replacement (1), the major VC rates ranges up to 9% using MANTA in unselected patients deemed to have calcified common femoral arteries (CFA) (2,3). Therefore, we recently developed an ultrasound-navigated method of MANTA deployment (US-MANTA) with the aim of exploring optimal usage and understanding failure mechanisms. We sought to assess the efficacy of the US-MANTA technique to compare the incidence of access-site major VCs and bleeding between the periods before and after introduction of the US-MANTA technique in the real-world setting.

Vascular access was established under ultrasound-navigated puncture, avoiding anterior wall calcification and bifurcation of CFA in all cases. At the end of the procedures, the activated clotting time was controlled to be below 250 s by protamine administration. Detailed descriptions of the US-MANTA method are as follows: scanning in a longitudinal view was used to identify the CFA with the MANTA toggle in situ (Figures 1A and 1B).

Step 1: The ultrasound image was maintained, and the sheath was withdrawn up to a pre-determined depth +1 cm. The toggle was released at this level and confirmed located adequately in the vessel as shown in Figure 1C. If the pre-determined deployment depth was not considered reliable, a new deployment depth was visually determined by confirming the toggle location inside the vessel.

Step 2: The assembly was pulled back slowly while maintaining an ultrasound image centered on the toggle with a 45° or more angle between the skin surface and the MANTA sheath. It was confirmed that the toggle was attached with the vessel wall in parallel (Figure 1D). If toggle stacking due to posterior vessel wall calcification occurred, the MANTA was pushed forward and released from the calcification. The assembly was then pulled back again, rotating the device by 30° to 45°, avoiding stacking.

Step 3: Pulling force was maintained while monitoring the color code of the tension gauge (green code) until the collagen pad was getting close to the vessel wall. The blue tamper tube was then advanced to further compact the collagen pad while keeping a pulling force (Figure 1E).

Step 4: Hemostasis was confirmed by visual inspection and ultrasound scan. According to the situation, manual compression with gentle pressure was added.

In a retrospective, single-center study performed between September 2017 and May 2019, 246 consecutive patients with conventional MANTA deployment
(C-MANTA) (1) and 153 consecutive patients with US-MANTA were evaluated. One-to-one propensity score matching resulted in 135 pairs with adequate balance of baseline characteristics with comparable sheath-to-femoral artery ratio (C-MANTA 1.03 ± 0.26 vs. US-MANTA 1.04 ± 0.21; p = 0.36) and moderate-to-severe calcification of CFA (C-MANTA 25.2% vs. US-MANTA 20.0%; p = 0.38).
In a matched series, access-site major VCs occurred significantly less frequently in patients with US-MANTA in comparison to those with C-MANTA (1.5% vs. 7.4%; p = 0.030), with significantly lower incidence of access-site life-threatening or major bleeding complication (1.5% vs. 8.9%; p = 0.008). Moreover, a significantly lower incidence of minor VCs (2.2% vs. 8.2%; p = 0.028) was observed in patients with US-MANTA. In multivariate analysis, US-MANTA (odds ratio: 0.29, 95% confidence interval: 0.08 to 0.80) was identified as the only independent predictor of less frequent access-site major VCs. Potential mechanisms of MANTA failure are also reported by surgical inspection and/or ultrasound imaging at the time of VCs in the total study cohort (Figure 1F).

US-MANTA may enable more accurate hemostasis following transfemoral transcatheter aortic valve replacement requiring a large-bore arteriotomy in unselected patients as compared with C-MANTA. Of note, this study is a single-center retrospective study, and large prospective trials are warranted to further investigate the efficacy of the US-MANTA strategy in the real-world setting.

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REFERENCES

RESEARCH CORRESPONDENCE
Severe Mitral Stenosis in Patients With Severe Mitral Annular Calcification
An Area of Unmet Need

The clinical presentation and guidelines for treating patients with rheumatic mitral stenosis (MS) often overlap with those patients with MS due to severe mitral annular calcification (MAC) (1). Unfortunately, there is a paucity of effective transcatheter treatment strategies for patients presenting in this latter group. Percutaneous mitral balloon commissurotomy (PMBC) is not effective for this pathology, and early attempts at transcatheter mitral valve replacement using a transcatheter aortic valve placed in patients with severe MAC demonstrated a high rate of complications and poor overall results (2). The 2014 and 2017 American College of Cardiology (ACC)/American Heart Association (AHA) valve guidelines do not specifically address treatment options for those who have severe MS from severe MAC. MS progresses more rapidly in those patients with severe MAC, and given the aging population, the prevalence of MAC is likely to increase (3,4). Further, those patients with significant MS who undergo transcatheter aortic valve replacement benefit less than their counterparts without mitral disease (5). In this study, we aimed to characterize this population with MS due to MAC with respect to the only available rheumatic MS guidelines and their unmet need.

The Cleveland Clinic database for the years 2007 to 2017 was interrogated for patients with severe MAC with a mean transmitial gradient ≥10 mm Hg, and who had ≥2 echocardiograms over a ≥1-year period. MS severity was assessed by peak and mean transmitial gradients, mitral valve area (MVA) by pressure half-time (PHT) and planimetry. Mitral regurgitation (MR) was assessed qualitatively and by PISA, MR velocity, orifice area, regurgitant volume, and regurgitant fraction. Wilkins score, presence of left atrial clot, and New York Heart Association (NYHA) functional class were also evaluated. The most recent echocardiogram for a given patient was used for this analysis. Death was captured by both social security death index and the electronic health record.