At follow-up, New York Heart Association functional class III or IV was present in 10% of the population. Mean transaortic gradients decreased from 44.3 ± 12.2 mm Hg (before TAVI) to 10.2 ± 5.2 mm Hg (after TAVI), and aortic valve area increased from 0.6 ± 0.2 cm² (before TAVI) to 1.9 ± 0.3 cm² (after TAVI; p < 0.001 for both comparisons). Perivalvular leak of 2+ or more was present in 15% of patients. No cases of intraprosthetic regurgitation were reported. Left ventricular ejection fraction also improved slightly from 46.6 ± 13.5% (before TAVI) to 50.5 ± 11.9% (after TAVI, p = 0.045). Finally, a minimum significant reduction in mean systolic pulmonary arterial pressure was reported (from 49.5 ± 15.6 mm Hg to 43.4 ± 10.2 mm Hg, p = 0.032).

In summary, this multicenter study demonstrated that TAVI with both available devices can be performed safely and effectively in patients with a pre-existing biological and mechanical mitral prosthesis. Further larger series and longer follow-up are warranted to determine better the safety, efficacy, and durability of TAVI in this particular population.

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Letters to the Editor

Blood Oxygen Level-Dependent Magnetic Resonance Imaging in Patients With Coronary Artery Disease

Arnold et al. (1) should be commended for their recent study in which they evaluated the clinical usefulness of blood oxygen level-dependent (BOLD) magnetic resonance imaging. They used 3-Tesla cardiac magnetic resonance and steady-state free precession sequence to overcome technical limitations encountered in the previous studies and reported a high diagnostic accuracy of BOLD imaging to identify anatomical and functional significance of coronary artery disease. However, the following pertinent points require further clarification.

A significantly large percentage of acute coronary syndromes patients (as high as 58%) have high blood glucose levels at the time of admission, regardless of their diabetes status (2–4). Further, undiagnosed impaired glucose tolerance is very common in patients with acute coronary syndromes at presentation, and the preadmission status of glucose tolerance cannot be relied on solely (2–4). Hence, it would be important to know if the authors made an attempt to evaluate the diagnostic performance of BOLD imaging in the setting of various blood glucose levels.

Because BOLD imaging exploits the differences in the magnetic property of oxyhemoglobin and deoxyhemoglobin. It would be interesting to know the effect of conditions like anemia, which affect blood oxygenation, on the diagnostic performance of BOLD imaging. The same also applies to other factors that affect the oxygen dissociation curve.

In the present context, a high false positive rate, limited spatial coverage, and uncertainties over the clinical implications of additional information obtained through BOLD imaging raise the concern that its use would lead to an additional layering of a diagnostic test without any proven clinical benefit.
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Reply

We thank Dr. Sharma for his comments on our report (1). Although blood oxygen level-dependent (BOLD) imaging is unlikely to offer incremental diagnostic benefit above first-pass perfusion assessment, it is conceivable, in the future, that it could serve as a viable alternative, with the added benefit of avoiding extrinsic contrast. However, we acknowledge that before this prospect can be realized, the technique requires significant further development, notably improvement in specificity and spatial coverage.

Our study involved patients with stable angina: subjects with acute coronary syndromes were excluded, and the diagnostic performance of BOLD imaging in the setting of varying glucose levels was not examined specifically. However, it is difficult to envisage a mechanism whereby altered glucose or hemoglobin levels would affect the oxygenation saturation of the hemoglobin molecule or the sensitivity of the BOLD technique. Factors that shift the oxygen dissociation curve alter the affinity of hemoglobin for oxygen, and hence, the relative quantities of oxyhemoglobin and deoxyhemoglobin. However, there is no reason to suspect that they would affect oxygenation sensitivity of the BOLD technique per se, and experimental evidence demonstrates the correlation between BOLD signal intensity and oxygen saturation over a range of values (2,3).

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