AORTIC VALVE REPLACEMENT is a category II indication for intraoperative transesophageal echocardiography (TEE). Increasingly in the operating room, TEE has become a modality of choice for assessing valves, planning surgical intervention, and evaluating postoperative valvular competence. This central role of TEE has catapulted the cardiac anesthesiologist to an active role in surgical decision-making. Three-dimensional (3D) echocardiography in the context of aortic valve surgery has gained special prominence, as evidenced by its superiority in assessment of the aortic valve area, severity of aortic stenosis, and anatomy and geometry of the left ventricular outflow tract (LVOT). In addition to its routine use, TEE examination may reveal incidental and/or unexpected findings, telling more than what was expected to be discovered.

In this issue of the Journal, Mancuso et al present a case of unexpected intraoperative findings that necessitated a debate on the surgical plan. Preoperatively, the patient was diagnosed with have critical symptomatic aortic stenosis due to history of worsening symptoms of shortness of breath and near-syncope. Aortic valve replacement was planned. During intraoperative TEE examination, the authors came across an unanticipated subaortic membrane, which was a source of LVOT obstruction. Findings on the aortic valve were equivocal, with partial thickening, regurgitation, and a high gradient across her LVOT on Doppler. These were significant clinical decisions that were comfortably navigated with the help of 3D TEE and its quantitative analysis.

Subaortic membranes usually present with symptoms similar to those of aortic stenosis and may be congenital or acquired. Combined with the high gradients across the LVOT, they may be difficult to differentiate from aortic valvular stenosis, especially if presenting in an elderly individual. In case of acquired membranes, it has been postulated that they result from altered flow dynamics in the LVOT, generating shear stress, inflammation, and fibrosis, and leading to subsequent membrane formation. In such cases, the pathology usually may extend to and involve the aortic valve. Alternatively, in older individuals, concomitant aortic stenosis may exist independent of the subaortic membrane. Given these possible scenarios, it becomes especially important to evaluate these patients critically with regard to their need for aortic valve replacement. A misstep in the wrong direction can lead to significant, undue morbidity and mortality. Therefore, careful and comprehensive use of tools such as 3D TEE, multiplanar reformatting, and planimetry should be made whenever possible in order to aid and assist in diagnostics as well as management.

Clinical usage of quantitative data truly underscores the utility and clinical value of intraoperative 3D TEE. It already has been appreciated that 3D echocardiography not only raises questions but also provides answers. This E-challenge case report goes a step further in which this additive information provided the central piece to solving the puzzle.

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