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Editorial / Editöryal Yorum

TAVI for very severe aortic stenosis

Çok ciddi aort darlığı için TAVI

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Very severe aortic stenosis (VSAS), as the name implies, is defined as very critical stenosis in the aortic valve. Despite minor differences between cardiac societies, diagnosis of VSAS is based on the fulfilling one of the following criteria: a peak aortic jet velocity (Vmax) ≥5.5 m/s regardless of left ventricular ejection fraction (European Society of Cardiology guidelines),[1] or an aortic Vmax ≥5.0 m/s or a mean gradient ≥60 mm Hg on Doppler echocardiography (ACC/AHA guidelines).[2]

It is clear that patients in the VSAS group, regardless of their symptom status, have high morbidity and mortality without valve replacement. We know from earlier studies that maximum aortic velocity is a significant predictor of outcome in patients with aortic stenosis (AS). The 2-year event-free survival is 43% and 25% in patients with a Vmax >5.0 m/s and >5.5 m/s, respectively, compared to 70% in those with 4.0-4.9 m/s.[3] Bradley et al.[4] have shown that an aortic velocity ≥5 m/s is associated with a >6-fold increased risk of cardiovascular mortality. In a multicenter trial, asymptomatic patients with VSAS (defined as an aortic-valve area of ≤0.75 cm^2 with either an aortic jet velocity of ≥4.5 m/s or a mean trans-aortic gradient of ≥50 mm Hg) were randomized to early surgical aortic valve replacement (SAVR) or to conservative care group and those assigned to early valve surgery had a significantly lower death from cardiovascular causes during the follow-up period.[5] That's why, as per most recent guidelines there is an indication of valve replacement in asymptomatic group if they have the diagnosis of VSAS (Class IIa in both ESC and ACC/AHA guidelines).

Abbreviations:

AS	*Aortic stenosis*
HG	*AS High gradient aortic stenosis*
SAVR	*Surgical aortic valve replacement*
TAVI	*Trans-catheter aortic valve implantation*
THV	*Trans-catheter heart valves*

Since 2002 transcatheter aortic valve implantation (TAVI) has emerged as a very good alternative to SAVR, for mechanical treatment of AS. Most recent ACC/AHA Guidelines recommend SAVR or TAVI equally for symptomatic severe AS patients aged over 65 years and for asymptomatic patients with systolic dysfunction but prefer TAVI over SAVR in patients aged over 80 years. A small group of asymptomatic patients including VSAS patients are recommended to undergo only SAVR, as there is no existing data to support TAVI in VSAS patients.

In this issue of Archives of the Turkish Society of Cardiology, Bozkurt et al,[6] aimed to investigate the impact and safety of TAVI in symptomatic VSAS patients. In a single-center retrospective observational study they evaluated, a total of 505 symptomatic AS patients who underwent TAVI over 9 years, between 2011 and 2019. The mean age of the study group was 77.8 years and VSAS (defined as critical AS with a peak aortic velocity ≥5 m/s or a mean trans-aortic pressure gradient ≥60 mm Hg on Doppler echocardiography) was present in 134 of 505 patients. The remaining 371 patients had the diagnosis of high gradient aortic stenosis (HG AS), making the overall ratio of VSAS patients in symptomatic AS group patients about a quarter (26.5%).

Even though their aim was to investigate the impact of the procedure, the authors reported on clin-

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ical differences between VSAS and HG AS in their analysis of symptomatic severe AS patients. They found that, VSAS patients, in summary, had less number of other cardiac pathologies, such as coronary problems, atrial fibrillation, mitral regurgitation and decreased systolic functions and more hypertrophied smaller hearts in a mostly female group (71% vs. 51%). Not surprisingly, they also had higher trans-aortic maximum-mean gradients, with smaller AV areas. As a limitation to their retrospective study, the investigators stated that, aortic valve calcification scores and rates were unavailable, which would have really helped our understanding of the VSAS pathology, and response to TAVI treatment. But their finding of 'more need for pre-dilatation' may be a signal for higher calcium load, as more calcium is one of the major reasons for pre-dilatation before prosthesis implantation.

The majority of their patients (96.4%) underwent trans-femoral TAVI with different trans-catheter heart valves (THV), which were selected according to the aortic annulus, calcification degree and operators' preference. The investigators found that TAVI was useful in both VSAS and HG AS groups and in follow up; there was no statistically significant difference in 30-day, 6th month, 1st year mortality and overall mortality in both groups according to Kaplan Meier analysis. According to simple and multiple Cox regression models by adjusting the parameters which were found as significantly different between the two groups, they found that mortality was significantly lower in VSAS patients compared to HG AS patients. Even though, the authors did not discuss the possible explanation of this interesting finding, it may be the result of 'less sick' hearts as VSAS had significantly lower prevalence of coronary artery disease and higher ejection fraction. Also, level of or distribution of valvular calcification degree which as noted above was not given in the paper may have contributed to better prognosis in those patients.

The authors need to be congratulated for their effort on this first ever study to precisely assess the impact of TAVI in a subset of patients with VSAS. This study shows that TAVI can be performed efficiently and safely in symptomatic VSAS patients with intermediate and high surgical risk, with comparable and somewhat better outcomes compared to HG AS patients.

We know the mortality rate for trans-femoral TAVI is lower than that for SAVR.[7] TAVI, also, is associated with a lower risk of stroke, major bleeding, and atrial fibrillation, as well as a shorter hospital length of stay, less pain, and more rapid return to normal activities. TAVI is not currently recommended in asymptomatic VSAS patients except for patients with an LVEF <50% who are ≤80 years of age. As noted in the study, there are ongoing randomized controlled trials like EARLY TAVR, AVATAR, ESTIMATE and EXPAND TAVR in asymptomatic group of severe and in moderate AS patients.[8–11]

With this data from the present study, and data accumulated over the years on percutaneous aortic valvular intervention, TAVI, it is safe to assume VSAS group will have similar, maybe better results when SAVR and TAVI interventions are compared in a randomized trial. Bozkurt et al, made a strong case for a need for such study in this particular group of asymptomatic patients.

Conflict-of-interest: None.

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