TAVR — The future of aortic stenosis management

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Madam, aortic valvular stenosis is the most common degenerative disease of old age that manifests as shortness of breath after a latent period of 10-20 years. Once the symptoms have started, aortic stenosis holds grim prognosis with mortality rate approaching 75% at three years. According to current American College of Cardiology/American Heart Association guidelines, cut-off values for Doppler-echocardiographic measurements of severe aortic stenosis are defined as follows: aortic valve area (AVA) <1.0 cm^2, mean gradient >40 mm Hg, and peak velocity >4.0 m/s.[1] Symptomatic severe disease often caused by age-related calcium deposition is universally fatal if left untreated, yet is consistent with a typical lifespan when mechanical relief of the stenosis is provided in a timely fashion. The mainstay in the management of aortic stenosis remains surgical aortic valve replacement (SAVR). Yet, SAVR has its own postoperative risks, particularly in the setting of concomitant co-morbidities and old age. Transaortic valvular replacement (TAVR), also known as percutaneous aortic valve replacement (PAVR) or transcathether aortic valve implantation (TAVI) is a newer treatment option that has revolutionised the management of aortic stenosis in high-risk patients who cannot afford to undergo SAVR due to the associated risks. The technique can also be utilized to correct stenosed or regurgitant bio-prosthetic valves known as transcathether aortic valve-in-valve (VIV) implantation.

The PARTNER trial compared the outcomes of both treatment modalities and concluded no differences in mortality, symptom reduction and valvular dynamics.[2] TAVR resulted in significantly shorter stays in the intensive care unit (ICU) and the hospital compared to the standard therapy. The functional status of patients in TAVR group was much better than the SAVR group. However, paravalvular complications and associated late complications were higher in TAVR group. Some major concerns that limit the use of TAVR in wider population include major strokes which were present at 3.8% in the first month and 5.1% in the first year of follow-up compared to SAVR which was 2.1% in the first month and 2.4% in the first year of follow-up. Possible aetiology might include hypotension, ischaemia or haemorrhagic events possibly related to anticoagulation and emboli. After this initial period, there is no evidence of higher stroke rates in either group, suggesting that the constant hazard of late strokes in these elderly high-risk patients is unrelated to the mode of valve-replacement therapy.[3] Transcathether replacement increases vascular complications compared to surgical replacement which presents with new onset atrial fibrillation and major bleeding episodes. Temporary rise in creatinine is often observed in TAVR compared to standard therapy and is often attributable to hypoperfusion, contrast or transfusion.[4] The follow-up with post-procedural echocardiography is similar to that of SAVR; however, it poses a challenge for the evaluation of implanted valve and may have erroneous calculation of valve area. Secondly, accurate quantification of regurgitant jet cannot be made easily, provided paravalvular regurgitation is an associated complication. American Society of Echocardiography / European Association of Echocardiography (ASE/EAE) have put forward the guideline to overcome these problems.[5]

Despite all the aforementioned concerns, there are success stories associated with it which encourages its application on broader population. What is required is the further refinement of the technique and longer prospective studies that can identify the population who can get the maximum advantage in terms of duration and quality of life.

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