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REPLY: BOOMER OR BAROMETER?

Reply to the Editor:

I read with interest the letter from Useini¹ concerning the recent article from Allen and colleagues² on transcatheter (TC) versus transthoracic (TTh) access for transcatheter aortic valve replacement (TAVR). There are a couple of his comments I can agree with in the letter. It would have been nice to have a discussion of the indications and contraindications for the use of TC access, but that has been previously discussed by Allen and colleagues³ and was not the purpose of the article. Useini¹ also cites authors like Folliguet and colleagues,⁴ who discuss this topic. The second area where I agree is that comments on paravalvular leak (PVL) would have been reasonable. PVL results from inaccurate choice of valve size (now rare with 3-dimensional computed tomography angiography sizing as a standard), patient anatomy, or misplacement of the valve on delivery. The only of those related to the choice of access site would potentially be misplacement of the valve. With the use of Sapien S3 valves (Edwards Lifesciences, Irvine, Calif) as discussed by Allen and colleagues,² misplacement is rare using any access approach and more-than-mild PVL is also very uncommon in current use. The authors cite a more-than-mild PVL rate of 18.6% for TC access in a study of 145 patients from 3 French centers among whom only 16.5% received S3 valves⁴—a poor comparison to the current work. This is a level of PVL unlikely to be seen in current practice and indeed would be totally unacceptable with any access approach currently used. Indeed, more contemporary research from the French group looked at 314 patients receiving a TC TAVR using the S3 valve from 13 centers.⁵ The rate of more-than-mild PVL was 5.1% in this larger cohort of all S3 valve recipients⁵ and provides a better comparison than that used by Useini in his letter.¹

There are also several areas where I disagree with Dr Useini's letter.¹ The author states that globally, TTh access is

among the procedures best supported by evidence. This is mainly older, outdated evidence. I recently looked at the past 3 years at my site for a talk on access. In slightly more than 1000 consecutive cases, we did 2 direct aortic and 0 transapical cases, with 98% being transfemoral (TF) and the rest split between trans-axillary and TC. Indeed, the recent publication of the US Transcatheter Valve Therapy Registry data by Carroll and colleagues⁶ showed that during 2019 the TF rate was 95.3% and that TTh access has approached 0. The TAVR field has advanced so rapidly that it is imperative to use contemporary data when making decisions for our patients. Useini¹ notes a high rate of carotid disease (48.5%) and states that this makes selection for a TC approach inappropriate. He furthers this claim by suggesting that a stenosis-free vessel is of paramount importance, citing the work of Overtchouk and colleagues,⁵ in which it is noted that one should use only a carotid artery “without significant stenosis or plaque at high risk of embolization.” This all refers to the carotid artery proximal to the sheath insertion site, which does not involve the carotid bifurcation—where the 48.5% disease rate occurs. Carotid bifurcation stenosis is not a contraindication for the use of TC access.³ In fact, other vessel qualities being equal, operators should choose the side with the greatest bifurcation stenosis as the access side (Keith B. Allen, personal communication, December 2020) Dr Useini also states that Allen and colleagues² report that stroke rate of 4.3% in the TC group was slightly higher than the TTh group (3.7%). He does not note that this has a nonsignificant *P* value of .44. Stating this is a slightly lower rate is a misunderstanding of statistics because these numbers are statistically the same. Useini¹ notes that in an analysis of the Sapien Aortic Bioprosthesis European Outcome Registry the stroke rate was 2.8% and the 30-day mortality was 4% for non-TF cases.⁷ Unmentioned was that the 30-day mortality for TF cases was 1.9% (*P* = .0023) and stroke was 1.3% (*P* = .47). Additionally, in this study TF has statistically less life-threatening bleeding, acute kidney injury, atrial fibrillation, prolonged ventilation intensive care unit length of stay, and hospital length of stay.⁷ Finally, Useini¹ asserts that when a no-touch technique is needed the TTh has even better outcomes than TF. This derives from previous work by Useini and colleagues⁸ looking at 19 patients with porcelain aorta of whom 15 underwent TTh access and 4 underwent TF access. Drawing conclusions from this very small sample is unwise.

I believe that the use of the term *alternative access* should be abandoned and access described as transthoracic or non-transthoracic.⁹ It is imperative that cardiac surgeons keep up with this rapidly moving field. The term *boomer*, as in the dismissive catchphrase, “OK boomer,” has been used pejoratively to suggest that those of my generation are behind the times and out of date. I tend to view cardiac surgeons as forward thinking and a barometer of what is to come. The place of cardiac surgery in the field of TAVR will hinge on our choices. Boomer or barometer? I say barometer.

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REPLY: TIME TO EMBRACE TRANSCAROTID TRANSCATHETER AORTIC VALVE

REPLACEMENT—NEW ROUTE, SAME VALVE

Reply to the Editor:

In this issue of the *Journal*, Dr Useini¹ continues the conversation of alternative access for transcatheter aortic valve replacement (TAVR), specifically highlighting some of the

current knowledge gaps in transcommon carotid (TC) TAVR following the report by Allen and colleagues² comparing the national experience of TC and transthoracic (transaortic or transapical) TAVR.

In his commentary, Dr Usenini¹ highlights some of the variables of interest missing from the TC Transcatheter Valve Therapy (TVT) report,² including rates of paravalvular leak, degree of internal carotid stenosis, stroke risk, and questions the appropriateness of TC TAVR. Although there are many factors impacting paravalvular leak (device type and generation, appropriate sizing, distribution of annular calcification, etc),³ access site is unlikely to significantly impact the rate or degree of paravalvular leak. As such, this should not be a deciding factor in access site for most patients. Risk of stroke has not been found to be significantly different in TC TAVR compared with other delivery methods,^{4,5} with experienced centers having stroke rate <2%, despite a greater degree of other comorbidities in the TC patient population.

Although we do not have direct insight to the degree of internal carotid stenosis, level of expertise of the TAVR teams with carotid access, preprocedure evaluation, technical details, or specific factors involved in the decision to perform TC TAVR from the TVT report,² it is evident that this report reflects the initial experience and learning curve with these procedures. As with all surgical procedures, experience and a systematic and reproducible approach are critical for improving outcomes. It is therefore not surprising that with increasing experience, stroke rates are lower than in the TVT report.⁶ In our practice, we evaluate the diameter, degree of calcification, and tortuosity of the common carotid and innominate arteries and the angulation with the aortic arch using standard preoperative TAVR computed tomography angiography. In addition, we evaluate the degree of stenosis of the internal carotid arteries by duplex ultrasound and then select to access the side with the greater degree of internal carotid stenosis to preserve cerebral perfusion via the contralateral carotid artery. We believe the small surgical incision of TC TAVR is associated with less morbidity than the transthoracic TAVR approaches (thoracotomy or median sternotomy) with shorter duration of hospitalization,² and similar length of stay to standard transfemoral approach.⁵

Insights from both the national and institutional experiences suggest multiple factors supporting the use of TC TAVR, including low stroke rates, less morbidity, and faster recovery compared with other alternative access strategies. Accordingly, cardiovascular surgeons should continue to gain experience with TC TAVR in an era with increasing demand for alternative TAVR access.

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