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Commentary: Carotid is the best alternative for femoral transcatheter aortic valve replacement?

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In a continually changing world, less invasive endovascular procedures modified the paradigm of standard surgical techniques. The standard access for transcatheter aortic valve replacement (TAVR) is percutaneous transfemoral (TF), because it is minimally invasive and it is associated with better clinical outcomes in comparison with all other approaches. Thanks to outstanding development of transcatheter heart valve technologies, including progressive evolution and downsizing of delivery systems and introducer sheaths, TF-TAVR is now feasible in more than 90% to 95% of patients.^{1,2}

However, a small but not negligible group of patients is still not suitable for TF access due to an unfavorable vascular peripheral anatomy or tortuosity of the thoracoabdominal aorta. The Placement of Aortic Transcatheter Valves Trial II trial³ showed that the outcomes of the alternative approaches compared with TF access were dismal and resulted in a contamination of the general results of TAVR in this randomized trial. Interest in transapical and transaortic approaches waned, and many groups began exploring options for a safe peripheral alternative access route that can generate similar results to the TF approach, avoiding chest opening. Among the other vascular access sites for TAVR, the superficial position of the carotid artery coupled with the more complex exposure of the subclavian artery and its proximity to the brachial plexus and the

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CENTRAL MESSAGE

The common carotid artery might be a safe alternative access route for selected TAVR patients.

risks associated with its use if an ipsilateral internal thoracic artery was used as a coronary bypass graft, have led to favor of the transcatheter (TC) over the subclavian approach in selected cases.⁴

Junquera and colleagues⁵ report on a relatively underutilized arterial access by setting it against the current TF standard of care. In this single-center experience, including 526 consecutive patients undergoing TAVR, TC-TAVR was performed in 127 patients and TF-TAVR in 399 patients. The objective of the study was to compare postprocedure and 30-day clinical events in TAVR performed by TC versus TF access using a multivariate logistic regression model. The strength points of the study can be summarized as 2 main concepts.

The first is the interesting matter of debate. Similar reports have shown that TC access is associated with better outcomes when compared with transthoracic access (ie, trans-apical/aortic), but scarce data are available regarding outcomes in comparison to TF access.⁴ Moreover, obtaining data from a single-center experience with a large number of procedures and a standardized approach is a positive.

The second is the results. In fact, the carotid artery was a safe alternative access to perform TAVR procedures, with 98.4% procedure success and also it was noninferior compared with TF-TAVR in terms of in-hospital mortality (3.2% vs 2.0%; $P = .39$) and 30-day stroke risk (2.4% vs 3.3%; $P = .81$) despite a higher disease burden in TC patients. Moreover, the straight access of a TC approach allows for better control of the implantation depth of the TAVR prosthesis and could also be among the potential factor for the lower rate of postoperative pacemaker implantation in this group (11% and 19%, respectively).

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Additionally, more frequent local vascular complications were observed in the TF group (18 patients; 4.5%) compared with the TC group (3 patients; 2.4%).

Despite all the positive aspects of the study, the main limitation of the Canadian experience⁵ was the lack of alternative approaches preferred in the non-TF cases. Potential drawbacks of carotid access are related to the interruption of the cerebral perfusion during valve implantation, risk of dislodging soft plaques leading to embolic strokes, presence of a small artery with the possibility of wall disruption or even the presence of contralateral carotid artery stenosis and cerebral arteriovenous malformation that may favor the occurrence of cerebral accidents. It would be interesting to compare the results of this approach with the surgical exposure of the left subclavian artery, which can be considered a second and safe alternative to TF-TAVR, considering also that there are a variety of factors to consider before an endovascular procedure, ranging from a patient's unique condition and anatomy to the skills of the team, the facility, and available technology. All of these factors needs consideration before TAVR implantation and therefore the possibility of

having only 2 options can become limiting or even dangerous.

We might answer our own question; that is, Is transcatheter access the best alternative for TAVR? by pointing out that the carotid artery is a good option for TAVR but, despite single-center experiences or larger multicenter trials, the selection of the optimal access route—including the femoral artery—should always be individualized to the patient.

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Commentary: Finding the best alternative for transfemoral transcatheter aortic valve replacement: Is it the transcatheter approach?

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CENTRAL MESSAGE

Comparison of the transcatheter approach with other alternative approaches is needed to determine the best approach for patients who are not appropriate candidates for the transfemoral approach.

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