Alternative TAVR Access: Is It Time to Alter Your Alternative Access Strategy?

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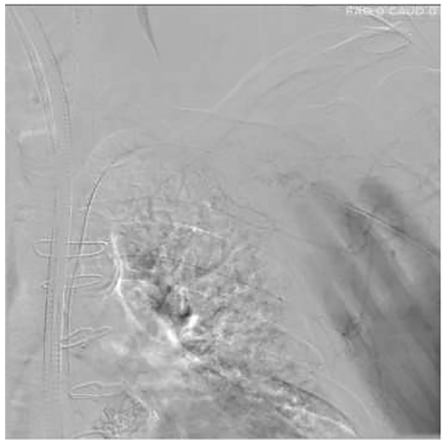
Alain Cribier's deployment of the world's first transcatheter aortic valve in 2002 was impetus to change the treatment paradigm for aortic stenosis. While early clinical trials were limited to patients deemed ineligible for surgery, transcatheter aortic valve replacement (TAVR) is now the treatment of severe symptomatic aortic stenosis in intermediate to high-risk patients, with ongoing clinical investigations in low-risk cohorts.[1,2]

Transfemoral access is typically used for valve delivery, but alternative access is necessary in some patients. The first TAVR valve was deployed via an antegrade transvenous-transseptal approach in a patient with severe peripheral vascular disease.[3] It is estimated that up to 35% of patients evaluated for TAVR have unfavorable iliofemoral anatomy (ie stenosis, calcification, tortuosity) with risk of vascular complications.[4] Early clinical trials recognized the risk, leading to a transapical approach for balloon expandable valves.[5] However transapical, and later transaortic, TAVR was associated with a significantly higher risk of morbidity and mortality.[6,7] Transaxillary (TAx) access was employed in self-expanding valve trials,[8–10] however balloon expandable valves have also been successfully deployed TAx.[11] As TAVR systems evolved, the delivery systems have decreased in size, allowing transcarotid and additional alternative access options.[11–12]

In the study presented, Dr Hysi et al describe outcomes with TAx TAVR performed in 43 patients, deemed ineligible for transfemoral, with 100% success with vascular access and a very low rate of major vascular complications, 4.25%. They conclude TAx TAVR is feasible and further note that all TAVR centers should have proficiency in an alternative access approach. We could not agree more and Dr Hysi and colleagues should be congratulated on their systematic study of TAx TAVR.

The TAx TAVR has many advantages. Axillary arteries are slightly smaller in diameter than femoral arteries but are often free of calcification, stenosis, or tortuosity. Current TAVR delivery systems require arteries of 5–6 mm diameter. Arnett et al performed a computer tomography angiogram analysis of axillary arteries, only 4% of patients had bilateral axillary arteries less than 5 mm.[13] Although the majority of TAx TAVRs are accomplished via surgical cutdown, percutaneous approaches have been described with low rates of vascular complication.[14,15] Deuschl et al published outcomes of a percutaneous TAx TAVR approach with no mortalities or major vascular complications at 30 days.[16] Caceres et al found in a meta-analysis of minimalist TAx TAVR that local anesthesia was used in one-third of cases, facilitating a next day discharge protocol.[17] Minimalist protocols have been shown to improve procedural efficiency, decrease length of stay,



Percutaneous transaxillary TAVR as alternative access, maximum operator radiation exposure.

Central Message

Given the increasing number of TAVR eligible patients, operator proficiency in an alternate access strategy is essential for comprehensive patient care.

Perspective Statement

Alternative access for transcatheter aortic valve replacement is uncommon. To optimize the likelihood of success, operators should perform alternate access cases when technically feasible or refer patients to centers of expertise. All transcatheter aortic valve replacement centers and operators should have a preferred alternate access technique and become as proficient as possible.

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and lower overall cost, and have shown no significant differences in morbidity/mortality.[18–20]

Limitations of the TAx TAVR technique are largely ergonomic and radiation exposure in nature. No dedicated TAx delivery systems are commercially available and operators must perform the entire procedure from a relatively uncommon position at the patient's left shoulder, positioned near the image intensifier (I/I) and often without shielding from ionizing radiation. Many hybrid rooms and cath labs are ill equip to facilitate procedures from the patients left shoulder and in the case of a cut-down for TAx access the sheath is typically manually held, with the operator's hands in the field and body in very close proximity to the I/I. Given the concern for lifetime radiation exposure, the TAx approach puts the operator at unnecessary risk.

All TAVR centers and operators must become proficient with an alternate access technique. Currently, transcaval TAVR is our preferred alternate access strategy. Transcaval allows for the operator to perform the TAVR in the usual femoral position, shields the operator from radiation, and is clinically well tolerated by patients. With over 700 cases documented in the literature, the percutaneous transcaval approach has been shown to be easily reproducible and safe.[21] Further, transcaval TAVR can be done with a minimalist protocol, in the cath lab, and the patient can be discharged the next day.

This discussion does raise many questions given the technical advancements in TAVR and the expansion of TAVR capable centers.

(1) Should TAVR operators have a degree of technical proficiency in all alternate access techniques or should operators focus on mastering one?
(2) Should all centers perform alternate access and offer every technique?
(3) What minimum number of cases does a center need to be proficient in an alternative access technique?

Despite the increasing number of patients undergoing TAVR, the cohort requiring alternate access remains relatively small. In regard to technical proficiency, no set standards are in place to define expertise in alternate access. To optimize the likelihood of a successful procedure, operators should perform alternate access cases when technically feasible and refer patients to centers of expertise when a unique access approach is required. Given the increasing number of TAVR eligible patients, operator proficiency in an alternate access strategy is essential for comprehensive patient care.

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