

Open trans-axillary access for TVAR patients: A step-by-step guide, tips and tricks

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Background:

Trans-catheter aortic valve replacement (TAVR) has been widely adopted for treatment of high-risk elderly suffering severe aortic valve stenosis. Nowadays, TAVR increasingly accommodate the intermediate, and even low-risk patients at the expense of surgical aortic valve replacement (SAVR). Trans-femoral (TF) approach has been the gold standard for TAVR for more than 20 years. Different thoracic (trans aortic, trans apical), and extra thoracic approaches (trans axillary/subclavian, trans-caval and trans-carotid) were described as an alternative for trans-femoral approach for patient who are not candidates for femoral access. Several advantages were reported for the trans axillary approach (TAX) approach, that defined TAX approach as a default second choice access.

Objective of the study:

To provide a safe reproducible step by step guide for open direct trans axillary approach for TAVR patients not amenable for the standard transfemoral approach, including patient selection, imaging modalities, patient preparation, team allocation, axillary access exposure, valve deployment and consumables.

Method and Results:

Patients included in the study had limited femoral access due to morbid obesity, peripheral vascular disease and calcifications. Procedure was done in the catheter lab. Hybrid team include surgical team and interventional cardiologist and anesthesia were working simultaneously. Axillary artery exposure under general anesthesia. Left axillary artery was the choice. The artery was reached through a 5 cm skin incision after careful dissection. Two vessel loupes were applied distal

and proximal to the site of the arterial puncture. Temporary pacemaker venous probe was placed

through internal jugular vein. Arterial pig tail was placed through the radial artery. Delivery system was as usual. Artery repair was done by interrupted suture to avoid artery stenosis. Skin closure was done by staples. ERAS protocol was implemented. Early postoperative outcome was satisfactory. Patients were extubated soon after the procedure 30-60 minutes. No AV block or bundle block were noticed. Patient was discharged between 3rd-4th day. After 7-10 days patient follow up in the out-patient clinic, staples was removed with clean dry wound.

Conclusion:

In summary, TAX TAVR appeared to be a safe alternative for the routine TF access. It provided an excellent early outcome. Anatomically, axillary artery being more elastic, resistant to calcification and proximate towards the target outweighs the rigid femoral artery which tends to calcify with age. Surgical exposure and direct repair of the artery, eliminate the risk of arterial access complications. Being an extra thoracic approach neutralize the risks of thoracic approaches and lower the risk for stroke. No special delivery system was needed. Without special learning-curve relationship and less consumables were utilized. The limitations of routinely used femoral access questioning the TF approach as a first-choice vascular access and open the way for more studies for feasibility of TAX approach as a competitive first-choice not only an alternative route to TF approach.

Keywords: TAVR, Trans femoral Access, Alternative TAVR access, trans axillary/subclavian access, less invasive approaches.