Precision in Distal Graft Deployment as an Additional Indication for Anterograde TEVAR through the Axillary Artery

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**Introduction:** Anterograde thoracic endovascular aneurysm repair (TEVAR) has been reported for patients with not suitable anatomy for retrograde delivery.

**Report:** We report the case of a 72 year old female patient that we treated with TEVAR via anterograde axillary approach for a different indication; lack of distal neck over the coeliac trunk.

**Discussion:** Anterograde TEVAR via the axillary artery is rarely needed. Although delivering the graft from the femoral artery allows some precision in distal landing, anterograde delivery can be much more precise when distal neck is very limited or non existing. We did not use a prosthetic conduit to protect the axillary artery and we express our objection in current trends that suggest the opposite strategy.

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**Keywords:** Anterograde TEVAR, Axillary artery conduit, Endovascular repair

**INTRODUCTION**
Anterograde TEVAR through the axillary artery is not a common procedure but can be a solution in cases with poor aortic, iliac or femoral access. We report an additional relevant indication for performing TEVAR through the axillary artery; the need of very accurate distal deployment and we express our objections regarding the necessity of prosthetic conduits.

**TECHNIQUE**
A 72 year old female patient was referred to our institution for a double aneurysm of the descending thoracic aorta with maximum diameter of 6 cm. Proximal graft deployment was simple as the aneurysm had a long neck. However, the distal neck was very poor with a conic configuration making distal deployment challenging and hazardous for potential covering of the coeliac trunk. In this elective case we decided to use both femoral and right axillary access without prosthetic conduits and deploy two “Valiant — Captivia” Thoracic Stent Grafts (Medtronic Cardiovascular Santarosa CA, USA) over a through and through super stiff guidewire. First, from the femoral artery, we deployed proximally a “closed web straight” — 38 mm graft. We then catheterized the coeliac trunk with a cobra catheter (again from the femoral artery) in order to have a distal landmark and as a backup plan in case of inadvertent coverage. Finally, we deployed the second graft (FreeFlo Straight — 38 mm) from the axillary access just above the coeliac trunk. Patient’s recovery was uneventful and postoperative computed tomography angiography (CTA) scan was satisfactory.

Supplementary video related to this article can be found at http://dx.doi.org/10.1016/j.ejvsextra.2012.12.001.

**DISCUSSION**
Most stent-graft deployment systems are designed for accurate proximal delivery as this is most often the anatomic challenge. In our case due to the length needed to be treated a combination of 2 grafts was necessary. We decided to deploy the proximal graft from the femoral artery and then the distal graft with a bare metal stent (Freeflo) from the axillary artery, in order to be absolutely precise and protect the coeliac trunk. We considered that doing the opposite (deploying first the distal graft) entailed a risk of displacing the distal graft while passing through it, with the sheath of the proximal one. Given the high aortic tortuosity we decided to use a through and through superfiff wire that gave us stability and secured access from both sides.

Stent-graft deployment from the axillary artery entails serious risks as rupture, dissection and embolization. We chose to use the right axillary artery instead of the left in order to reduce angulation and friction during advancement of the introducing system of the graft.

Although traditional deployment of the distal graft from a femoral approach was possible and can be reasonably precise at the level of distal neck with careful measurements; still it remains approximative and indirect in comparison to an anterograde approach that may give...
precision of few millimetres. In our patient this was necessary as there was literally no distal neck. Sacrificing the coeliac trunk has been described without severe consequences provided a patent gastro-duodenal arch, however we believe that saving a major artery when feasible should always be a priority, especially in elective cases.

Other endovascular options may have been possible for this patient, such as distal periscope stent grafts or a custom made stent graft with a scallop or fenestration for the coeliac trunk.

We punctured directly the femoral and axillary artery without suturing a conduit as we do not see any technical advantage in this strategy. We note however the current trend in several centers to do the opposite.\(^1\)\(^-\)\(^3\) Saadi et al.\(^3\) cites the work of Sabik\(^5\) that published the most significant data supporting axillary artery cannulation using a side branch. This study investigates the role of prosthetic conduits in the context of extracorporeal circulation installation for aortic arch surgery. However, there is a major difference: in cardiac surgery the arterial cannula does not enter the artery and remains in the side graft; hence a lower rate of arterial damage is plausible. In anterograde TEVAR the stent graft delivery system will enter either way into the arterial tree.

**CONCLUSION**

This is the first report of anterograde TEVAR from the axillary artery for absolute precision in distal stent-graft...
deployment. In our opinion this approach can be useful in selected cases. The use of a prosthetic conduit is not justified and shouldn’t be used in all patients.

CONFLICT OF INTEREST/FUNDING
None.

REFERENCES