Fully Percutaneous Transaxillary Transcatheter Aortic Valve Implantation in patients with a patent left internal mammary graft

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Case presentation

- 80 year-old male
- Dyspnea on exertion (NYHA II-III)
- Hypertension, dyslipidemia, COPD (moderate/severe), CKD (eGFR 45 ml/min/1.73m²)
- CAD: Previous CABG (LIMA-LAD; SVG-MO-PDA)
  - April 2018: **patent LIMA-LAD**, occluded SVG and RCA, critical LCX → DES
- PAD: aorto-bifemoral bypass, PTA of bil.SFA
- Severe aortic stenosis (meanG 60 mmHg), normal LVEF
- EuroSCORE II = 9.3%, STS = 6%
Preoperative imaging

**Aortic Valve**
- Moderate-severe calcifications
- Tricuspid valve

**Aortic Annulus**
- Diameters: 19 x 26.4 mm
- Per. der. diam: 23.5 mm
- Perimeter: 74 mm
- Area: 418 mm²

**LVOT**
- Diameters: 17 x 28 mm

**Coronary ostia height**
- LCA 13 mm / RCA 16 mm

**Aortic-VBR angle**: 45°
Preoperative imaging

Aorto-bifemoral bypass → Not suitable for Transfemoral approach

Subclavian and axillary artery

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>8.8 x 9.0 mm</th>
<th>9.8 x 11.7 mm</th>
<th>7.9 x 8.3 mm</th>
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Good caliber and mild calc / Suitable for EnveoR 14Fr

→ Transaxillary approach
Our treatment

Wire placement

Direct transaxillary puncture
Under fluoroscopy and echo guided

Lt. radial (6Fr) → LIMA as a safety net during TAVI
Rt. femoral (7Fr) → Lt. axillary artery for orientation to puncture

Pre-closure with 2 ProGlide EnveoR 14Fr inserted

*temporary-pacemaker
Our treatment

Deliver system over the INNOWI wire

Evolut R 29mm implantation

Mild PVL
Our treatment

After 2 ProGlide closure, extravasation

Covered stent (7×24mm) implantation

Final angiography
Our treatment

Patent LIMA after TAVI
No vessel injury
1POD; Axillary access is fine, only small hematoma

4POD; Discharge without complication
Anatomy of Axillary Artery

pm; pectoralis minor muscle, tm; teres major muscle.
(1) superior thoracic artery, (2) thoracoacromial artery, (3) lateral thoracic artery, (4) subscapular artery, (5) anterior humeral circumflex artery, (6) posterior humeral circumflex artery (7) subclavian artery; brachial artery (8) brachial artery

Previous reports recommended...

- Easy to check pulse and echo
- Possible to compression just in case

Other experience

Subclavian and axillary artery

Preoperative CT
Good caliber with mild calc

Transaxillary TAVI

Perfect hematosis only with 2 ProGlide
Transaxillary TAVI in patients with LIMA graft

Previous report suggested...

- No impairment of LIMA flow despite 18Fr sheath in subclavian artery
- Safe approach in a minimum 7.5mm subclavian artery diameter


- Gentle procedures are needed to avoid vessel injury
- Careful ECG monitoring during TAVI
- Wire protection of LIMA is useful
Take Home Message

- Our experience suggests that fully percutaneous transaxillary approach without surgical cut-down is feasible and safe with a satisfactory short-term outcome.

- This approach has the potential to become an alternative artery access in patients with non-suitable for transfemoral or transapical TAVI, even in patients with a patent LIMA to LAD.