POLISH ARCHIVES OF
Internal Medicine
POLSKIE ARCHIWUM MEDYCYNY WEWNĘTRZNEJ

ONLINE FIRST

This is a provisional PDF only. Copyedited and fully formated version will be made available soon.

Delayed left subclavian artery pseudoaneurysm following transcatheter aortic valve implantation

Authors: Angelo Buscaglia, Giacomo Tini, Manrico Balbi, Gian Marco Rosa, Roberta Della Bona, Italo Porto

Article type: Clinical image

Received: June 11, 2020.

Accepted: September 11, 2020.

Published online: September 15, 2020.

ISSN: 1897-9483

Delayed left subclavian artery pseudoaneurysm following transcatheter aortic valve implantation

List of authors:

Angelo Buscaglia1

Giacomo Tini1

Manrico Balbi1,2

Gian Marco Rosa 1,2,

Roberta Della Bona 1,2

Italo Porto 1,2

Affiliations:

1.Clinic of Cardiovascular Diseases, University of Genoa, Genoa, Italy

2IRCCS Ospedale Policlinico San Martino Genoa

Short title Delayed pseudoaneurysm following TAVI.

Details of corresponding author:

Gian Marco Rosa MD, PhD , Assistant professor University of Genoa, IrccS-San Martino Hospital Genoa. Postal adress: IrccS-San Martino Hospital, Largo Rosanna Benzi 10 Genova. Istitutional telephone number: 0039-(010) 5557202 E-mail adresss: gmrosa@libero.it

Conflict Interest statement: Conflict of interest: none declared

In 10-15% of patients undergoing transcatheter aortic valve implantation (TAVI), the femoral artery approach is precluded owing to insufficient caliber or tortuosity of the vessel [1]. In these subjects,

the subclavian (SC) or the axillary (AX) access can be used; these have proved equivalent to the femoral artery approach in terms of both survival and the rate of vascular complications [2]. The SC or AX approach usually require a surgical cut-down under general anesthesia or deep sedation, though cases have been described in which the percutaneous technique has been adopted. [2-4]. Furthermore, SC and AX access may be burdened by complications, such as vessel perforation or rupture, or the formation of aneurysms at the site of incision [4,5]. In particular , in an interesting study, Ozturk et al have demonstrated that the diameter of the axillary artery has an important role not to lead dissection of the vessel, furthermore compared to the transfemoral access the shorter distance between the delivery sheat and aortic valve is an advantage allowing a better positioning and control of the device [2,5].

We report the case of a 79 year-old woman who was admitted to our hospital owing to worsening dyspnea and severe aortic stenosis (mean transvalvular gradient: 53 mmHg). As the patient was frail and suffered from various comorbilities, the heart team decided to perform TAVI.

Pre-operative computerized tomography (CT) showed non-critical lesions of both the medial anterior interventricular artery and the medial circumflex artery. Moreover, the abdominal aorta and SC arteries appeared atheromatous, and a severe peripheral arteriopathy was revealed. The left SC was therefore chosen. Access was obtained through a 4 cm incision in the deltopectoral groove, under general anesthesia. Care was taken to avoid damaging the brachial plexus, and a 5-0 polypropylene purse-string suture was then fixed to the anterior wall of the artery.

A Medtronic Corevalve Evolut R 26 mm was implanted. The purse-string suture was tied under direct visualization, without complications. After implantation of the valve, the SC, radial and ulnar pulses were detectable. The patient was discharged in good cardiovascular condition.

One week later, however, the patient started complaining of left arm dysesthesia, weakness and pain. Cerebral CT and vascular ultrasound scan of the SC at the site of incision were unremarkable, but neurological evaluation was compatible with brachial plexus compression.

Subsequently, an angio-CT scan showed the presence of a 2.5x2.8 cm left SC pseudoaneurysm, proximal to the site of incision, which compressed the cervical spine (Figure 1A).

The vascular lesion was treated with the implantation of an 8x5 mm Gore Viabahn covered stent, which yielded a good final angiographic result (Figure 1B and Figure 1C). The patient was discharged with residual functional limitation of the left arm, which improved over the following weeks. However, only after six months did she fully recover the neurological function of the arm.

To our knowledge, this is a very rare case of SC pseudoaneurysm caused by a TAVI procedure. While vascular SC access complications are usually acute [2], in this subject the pseudoaneurysm appeared later. Notably, it occurred proximal to the site of incision, in a challenging spot for ultrasound detection.

It may be hypothesized that insertion of the delivery sheath into the vessel may have dislodged a pre-existing atherosclerotic plaque, thereby causing a pseudoaneurysmatic lesion. Neurological consequences were not immediate and might have been due to compression of the brachial plexus.

We must bear in mind that, when the SC TAVI approach is adopted and the patient manifests neurological symptoms possibly related to nerve compression, careful multimodal evaluation of the entire vessel should be performed, in order to rule out any possible vascular complication, even if the site of incision is not strictly involved.

References

1.Pascual I, Carro A, Avanzas P, et al. Vascular approaches for transcatheter aortic valve implantation. J thorac Dis. 2017; 9: S478-S487

2. Caceres M, Braud R, Roselli EE. The axillary/subclavian artery access route for transcatheter aortic valve replacement: a systematic review of the literature. Ann thorac Surg. 2012; 93:1013-1018

3. Petronio AS, De Carlo M, Bedogni F. et al. Safety and efficacy of the subclavian approach for transcatheter aortic valve implantation with the CoreValve revalving system. Circ Cardiovasc Interv .2010; 3: 359-366

4. Vavuranakis M, Vrachatis DA, Filis K, Stefanadis C Transcatheter aortic-valve implantation by the subclavian approach complicated with vessel dissection and transient left-arm paralysis. Eur J Cardiothorac Surg.2011; 39:127-129

5. Ozturk C, Iyisoy A, Sahin MA et al. Left subclavian artery dissection and repair after transcatheter aortic valve implantation. International journal of Cardiology. 2016;204:77-80

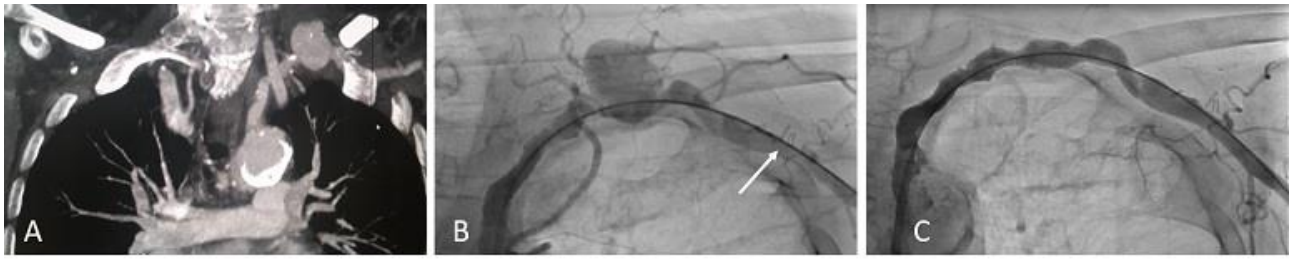

Fig 1. A: Angio-Computed Tomography study showing a 2.5x2.8 cm left subclavian pseudoaneurysm. B: Left subclavian angiography study showing pseudoaneurysm proximal to the incision site (arrows). C: Left subclavian angiography showing flow exclusion of the pseudoaneurysm after covered stent deployment (Gore Viabahn 8 x 5 mm)