

Iatrogenic Lesion of the Common Femoral Artery

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2. Key words

TAVI; Transfemoral; Percutaneous; Access complications

1. Abstract

Vascular complications are frequent adverse events associated with Transfemoral Transcatheter Aortic Valve Implants (TF-TAVI). An 86 year-old woman with severe aortic valve stenosis admitted in Cardiology for an elective TAVI. Through a bifemoral percutaneous access, an aortic valve was correctly implanted. After unsuccessful percutaneous closure of the common femoral artery, a stent-graft was deployed through a cross-over femoral access to contain bleeding. A new angiography showed active bleeding and absence of femoral outflow. The patient underwent emergent surgery, where the stent was confirmed partially deployed outside the artery. The device was removed and patch angioplasty was performed. Percutaneous access is considered a less invasive approach. Nevertheless, it associates up to 46.3% complications and up to 24.4% of the severe surgery [1]. So is this really less invasive or is it the cost of interventional cardiology? The use of covered stent in the common femoral artery can be lifesaving. However, it may cause severe limb ischemia and may jeopardize vascular access for future procedures. In our experience, open repair is preferred over stenting of the common femoral artery, which should be saved for life-threatening haemorrhages. Open and percutaneous access should both be considered to provide a tailor-made approach.

3. Introduction

The Common Femoral Artery (CFA) is the most common access site for endovascular procedures [1]. Procedural factors, which mostly influence risk of complications, include use of a sheath size greater than 8 Fr [2] Vascular Complications (VC) remain the most frequent adverse events associated with Transfemoral Transcatheter Aortic Valve Implant (TF-TAVI) procedures, and usually require surgical repair. VCs have been shown to be an independent risk factor for mortality [1,3] therefore their avoidance and resolution should they occur are a matter of great interest in interventional cardiology.

4. Case Report

An 86 year old woman presenting class III-NYHA dyspnea due to degenerative severe aortic valve stenosis who was admitted in Cardiology for an elective TAVI. Through a bifemoral percutaneous accesses, an aortic valve was correctly implanted (Edwards SAPIEN XT #20, through a 16F sheath). Both femoral arteries were patent before implantation. Initially the right femoral bifurcation showed patency of both superficial and deep femoral

artery. After unsuccessful closure of the right common femoral artery with two percutaneous closure systems (Perclose ProGlide, Abbot), leakage of contrast medium was observed through fluoroscopic imaging (**Figure 1A**). A 7x38mm stent-graft was deployed in the femoral region through a contralateral cross-over femoral access in an effort to contain bleeding (**Figure 1B**). A new angiography showed active bleeding into the groin and absence of femoral outflow due to coverage of both superficial and deep femoral arteries (**Figure 1C**), on account of which, the patient underwent emergent surgery under general anaesthesia. Intra operatively, the position of the covered stent was verified and a misplacement was confirmed. The crossover guide wire had inadvertently migrated outside the femoral artery and the stent had been partially deployed outside the vessel (**Figure 2A**). The device was removed (**Figure 2B**) and patch angioplasty with great safene vein was required to repair the artery (**Figure 2C**). After surgery, the patient had a favourable evolution without further complications of the wound or remaining hematoma and received discharge 7 days later with dual ant platelet therapy.

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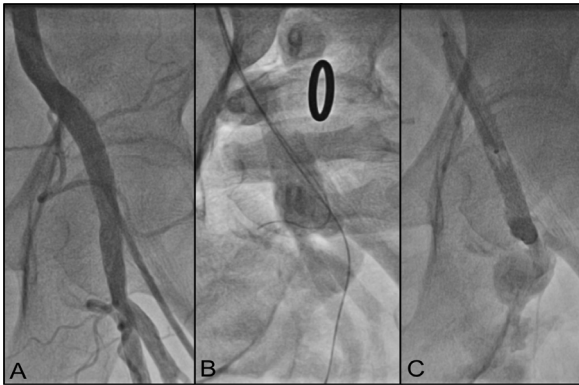


Figure 1: Fluoroscopic Imaging. 1A Shows patency of the femoral bifurcation before attempt of closure of artery. 1B Misplacement of crossover guide wire before implantation of covered stent. 1C Lack of femoral outflow and leakage of contrast medium in to the groin.

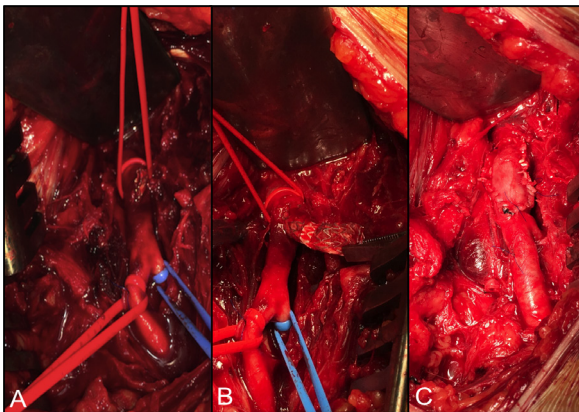


Figure 2: Images of surgery. 2A Dissection of the femoral bifurcation: top red vessel loop is the common femoral artery, bottom red vessel loop is the superficial femoral artery and blue vessel loop is the deep femoral artery. The distal end appears outside the vessel. 2B While extracting the stent-graft. C. Arterial reconstruction with patch angioplasty using great saphenous vein.

5. Discussion

A high incidence of TAVI-associated Vascular Complications (VC) have been identified. Published studies using the first-generation devices showed an incidence of major VC varying from 5% to 23%. Recently published data have suggested improvement in VC, due to the combination of newer device generations, smaller delivery systems, and the use of adjunctive techniques, combined with better screening and increased operator experience [3]. Percutaneous access is thought to be a less invasive approach and allows treatment in patients with high risk. Nevertheless, Spitzer et al showed percutaneous access in TF-TAVI associates 46.3% complications compared to 27.3% in open access, at the expense of hematoma, false aneurysms, arteriovenous fistulae, femoral dissection, vascular stenosis and local bleeding. In fact, up to 24.4% of percutaneous accesses eventually require surgical repair. So is this really less invasive than primary open access, or is it the cost of interventional cardiology? Furthermore, the use of covered stent in the common femoral artery can be lifesaving in those

vascular major complications [4]. Nevertheless, stenting of the common femoral artery associates stent occlusion and severe leg ischemia more frequently, probably because the stent material is not appropriate for the dynamic characteristics of this region [5]. It may jeopardize vascular access for future endovascular procedures in a prevalently atherosclerotic population [6], and in some cases occlude the femoral profunda artery leading to critical limb ischemia in case of future stent occlusion. Surgery is the optimal treatment for patients with large or expanding hematomas, in spite its association with a significant incidence of wound complications [7].

6. Comments

In our personal experience, stenting of the common femoral artery should be safed for life-threatening haemorrhages. When their placement is absolutely required, it should be performed using short stents and always ensure correct guide wire position before deployment. Open and percutaneous access should both be take into consideration in order to provide a tailor-made and patient-orientated approach.

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