Clinical outcomes of percutaneous treatment of access site-related vascular injury after transfemoral transcatheter aortic valve implantation

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Introduction: Percutaneous transfemoral transcatheter aortic valve implantation (pTF-TAVI) is an established method for the treatment of aortic stenosis in elderly patients. Despite improvements in this approach, access site-related vascular injury (ASRVI) remains a common complication[1]. Although the implantation of a stent-graft (SG) in the common femoral artery (CFA) is not recommended, it is used to treat ASRVI despite the lack of clinical evidence[2]. The aim is to evaluate the clinical outcomes in patients undergoing peripheral intervention for ASRVI related to pTF-TAVI.

Patients and Methods: This single-center retrospective analysis included all patients undergoing pTF-TAVI who experienced ASRVI treated with either balloon angioplasty or SG implantation in the CFA. Patient demographics, comorbidities, as well as procedural data during TAVI were collected. Patient clinical follow-up (FUP) data was collected during FUP interviews.

Results: A total of 197 patients underwent pTF-TAVI with MANTA as the primary vascular closure device. A total of 31 patients (15.7%) had ASRVI, the majority of whom (N=30, 96.7%) were successfully treated percutaneously and included in the study. The general patient and procedural characteristics are shown in **Table 1**. Of the 30 patients, 8 (26.6%) underwent balloon angioplasty and 22 (73.4%) underwent SG implantation. The mean FUP was 11 ± 6.3 months. The mean diameter of the balloon or SG

TABLE 1. General and procedural characteristics of patients undergoing percutaneous treatment of access site-related vascular injury after transfemoral transcatheter aortic valve implantation.

	N=30
Female - n (%)	16 (53.33)
Age – mean ± SD	81.38 ± 6.55
Coronary artery disease*, n (%)	17 (56.67)
Atrial fibrillation, n (%)	8 (26.67)
Chronic obstructive pulmonary disease, n (%)	4 (13.33)
Chronic renal insufficiency**, n (%)	13 (43.33)
Peripheral artery disease, n (%)	17 (56.67)
Occlusive PAD***, n (%)	8 (26.67)
Aortic valve replacement before TAVI, n (%)	3 (10)
Mean left ventricular ejection fraction ± SD	51.72 ± 12.41
Self-expanding valve, n (%)	20 (66.6)
Mean valve size ± SD	29.27 ± 6.23

*defined with coronary angiography; **defined as estimated glomerular filtration rate <60 ml/min/1.73 m^2; ***Occlusive peripheral artery disease defined with CT angiography; SD standard deviation

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used was 8.04 ± 1.13 mm. In the cases in which SG was implanted, most were balloon-expanding SG (N=19, 86.36). At FUP, 2 (6.67%) patients reported intermittent claudication, 6 (20%) had nonspecific limb pain, and the majority (N=23, 76.67%) had a walking distance of > 500 m. One patient initially treated with balloon angioplasty developed limiting claudication and underwent stent implantation. A comparison of clinical outcomes between patients treated with BD or SG is shown in **Table 2**.

TABLE 2. Comparison of clinical outcomes of patients treated with balloon angioplasty or stent-graft implantation.

Clinical outcome	General (N=30)	Balloon angioplasty (N=8)	Stent-graft implantation (N=22)
Intermittent claudication, n (%)	2 (6.66)	1 (12.5)	1 (4.54)
Non-specific limb pain, n (%)	6 (20)	0 (0)	6 (27.27)
Additional vascular procedure*, n (%)	1 (3.33)	1 (12.5)	0 (0)
Walking distance (m), n (%)			
< 100	1 (3.33)	1 (12.5)	0 (0)
100 – 200	2 (6.66)	0 (0)	2 (9.09)
– 500	3 (10)	0 (0)	3 (13.63)
500 or more	23 (76.66)	7 (87.5)	16 (72.72)
Mortality**, n (%)	4 (13.33)	1 (12.5)	3 (13.63)
CVI***, n (%)	1 (3.33)	1 (12.5)	0 (0)
Permanent pacemaker implantation, n (%)******	1 (3.33)	0 (0)	1 (4.54)

*Need for additional vascular intervention (percutaneous or surgery) during clinical follow-up, at the access site-related vascular injury site; **Mortality during clinical follow-up; ***Cerebrovascular insult during transcatheter aortic valve implantation procedure; ****Need for permanent pacemaker implantation after the transcatheter aortic valve implantation procedure.

Conclusion: The results of our single-center analysis demonstrate that peripheral vascular interventions, including implantation of SG in CFA, provide satisfactory 1-year clinical outcomes in elderly patients undergoing pTF-TAVI and thus can be considered as a bailout method for the treatment of ASRVI. Patients initially treated with SG did not need reintervention as they had no lifestyle-limiting claudication.

LITERATURE

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