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Hanane Benhalla

Camelia Sorea

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Transcatheter Aortic Valve in Valve Implantation Through a Prosthesis Carotid Artery: First Case

HANANE BENHALLA AND CAMELIA SOREA

From Brussels Heart Center, Brussels, Belgium

BENHALLA AND SOREA: ***Transcatheter Aortic Valve in Valve Implantation Through a Prosthesis Carotid Artery: First Case:*** In recent years, transcatheter aortic valve implantation has become an emerging alternative for high-risk patients with severe aortic stenosis. We report a case of transcatheter aortic valve implantation with the self-expanding Medtronic CoreValve bioprosthesis through a left common carotid artery. This 83-year-old male patient presented with heart failure due to a severe degenerative aortic bioprosthesis, with several comorbidities, resulting in a logistic EuroScore II of 36%. Consequently, he was rejected to undergo surgery and a transcatheter approach was planned. And due to severe peripheral vascular disease with iliofemoral lesions, significant calcifications of the innominate artery, we considered a left carotid access through a prosthesis carotid in Dacron. The procedure was successful without cardiac, cerebrovascular, or access complications. And it appears to be a valuable alternative access for patients with severe peripheral vascular disease. *(J HK Coll Cardiol 2015;23:6-9)*

Carotid bioprosthesis, Percutaneous aortic valve, Valve in valve

摘要

近年來，經導管主動脈瓣植入術，已經成爲重度動脈瓣狹窄高危患者的緊急替代方法。我們報導一例通過左頸總動脈予置有美敦力公司自主擴張型生物假體的患者行經導管主動脈瓣植入術的案例。一名由於嚴重假體主動脈退化導致心功能衰竭的83歲男性患者，同時伴有多種伴發病，logistic EuroScore II評分既爲36%，以至於他拒絕手術治療，而計畫採取經導管途徑的治療方式。又由於患者嚴重的周圍性血管疾病與髂股的病變、明顯的無名動脈鈣化，我們考慮通過聚酯纖維假體頸動脈到達左頸總動脈。手術成功完成，並且未發生心臟、腦血管或者手術操作併發症。通過頸總動脈假體經導管主動脈瓣植入術可能是治療伴有嚴重周圍性血管疾病患者的有效選擇方式。

關鍵詞：頸動脈生物假體、經皮主動脈瓣、瓣中瓣

Introduction

The first percutaneous aortic valve replacement has been performed by Dr. A. Cribier in 2002, opening a new therapeutic approach to patients at high surgical risk for conventional operation by sternostomy.

Within a short time, there has been an improvement of the material and a simplification of the procedure, the surgical approach used and the implantation technique. However patient selection remains crucial. We describe a percutaneous aortic valve implantation (a CoreValve bioprosthesis) in a degenerated bioprosthesis without an adequate vascular access, and which we decide to add prosthesis carotid in Dacron in per operative procedure.

Case Report

An 83-year-old male, presented with heart failure due to a severe degenerative aortic bioprosthesis operated in 2009, with comorbidities included diabetes, hypertension, chronic pulmonary obstructive disease,

Address for reprints: Dr. Hanane Benhalla
23 lotissement lamia, Bourgogne Casablanca, Morocco

Email: hanane.benhalla@yahoo.fr

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as well as peripheral and coronary artery disease, resulting in a logistic EuroScore II of 36%. Preinterventional morphological patient screening included transthoracic as well as transesophageal echocardiography, confirmed a severely calcified aortic bioprosthesis with a mean transprosthesis gradient of 53 mmHg, valve area 0.8 cm^2, and ejection fraction of 40%.

Computed tomographic illustrate showed a peripheral vascular disease with iliofemoral lesions, the diameter of the common iliac artery was of 5 mm and the subclavian arteries were about 5-6 mm with significant calcifications and unfavourable angulations of the innominate artery. Therefore, we considered a left carotid access, with a diameter of 6.5 mm, as the only solution with the use of a prosthesis carotid in Dacron to facilitate the procedure. The aortic annulus diameter, and the distance of the coronary ostia were also evaluated.

The carotid artery was first reopened under local anaesthesia and then after intubation and induction of general anaesthesia, endarterectomy of the left carotid artery was performed. Thereafter, an 8 mm Dacron prosthesis was connected to the left common carotid artery in an end-to-side fashion and a sheath was introduced into it. Via this approach, a self-expanding aortic valve prosthesis (CoreValve, Medtronic) was placed in typical position but 4 mm below (Figures 1 & 2). Importantly, the introducer sheath was not advanced into the carotid artery, so that antegrade blood flow was maintained during the entire TAVI procedure without further shunting. A localization 4 mm below the position is considered ideal for implantation. In this case (Figure 3) this may explain the immediate postoperative transaortic prosthesis mean gradient of 20 mmHg ,with aortic prosthesis area of 1.1 cm^2.

In the Post-operative follow up there is an important improvement of signs of heart failure within the first week for the patient.

The patient was seen one month after the procedure with a clear clinical improvement and regression of his episodes of cardiac decompensation.

Discussion

The entry in our case of the right native carotid artery was facilitated by the introduction of a prosthesis carotid in Dacron. The advantages of this procedure, are an optimal neuromonitoring during the carotid surgery in local anaesthesia and a simple implantation of the catheter-based aortic valve prosthesis via the same

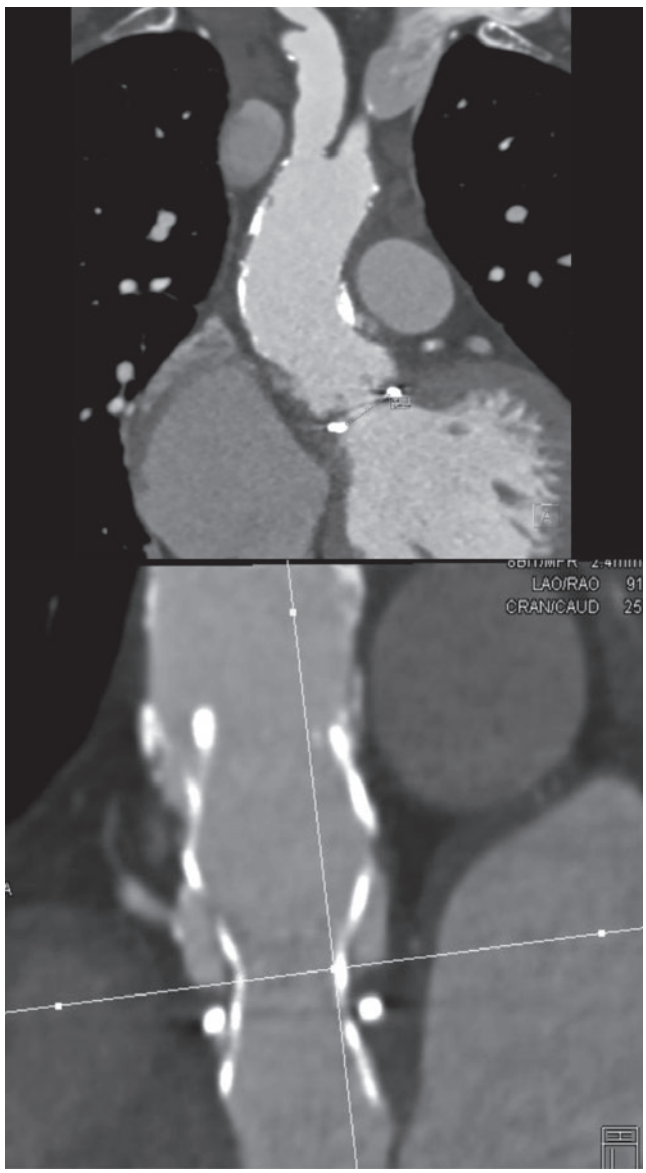

Figure 1. *Computed tomographic viewing the aortic prosthetic ring with calcifications before and after the endovalve implantation.*

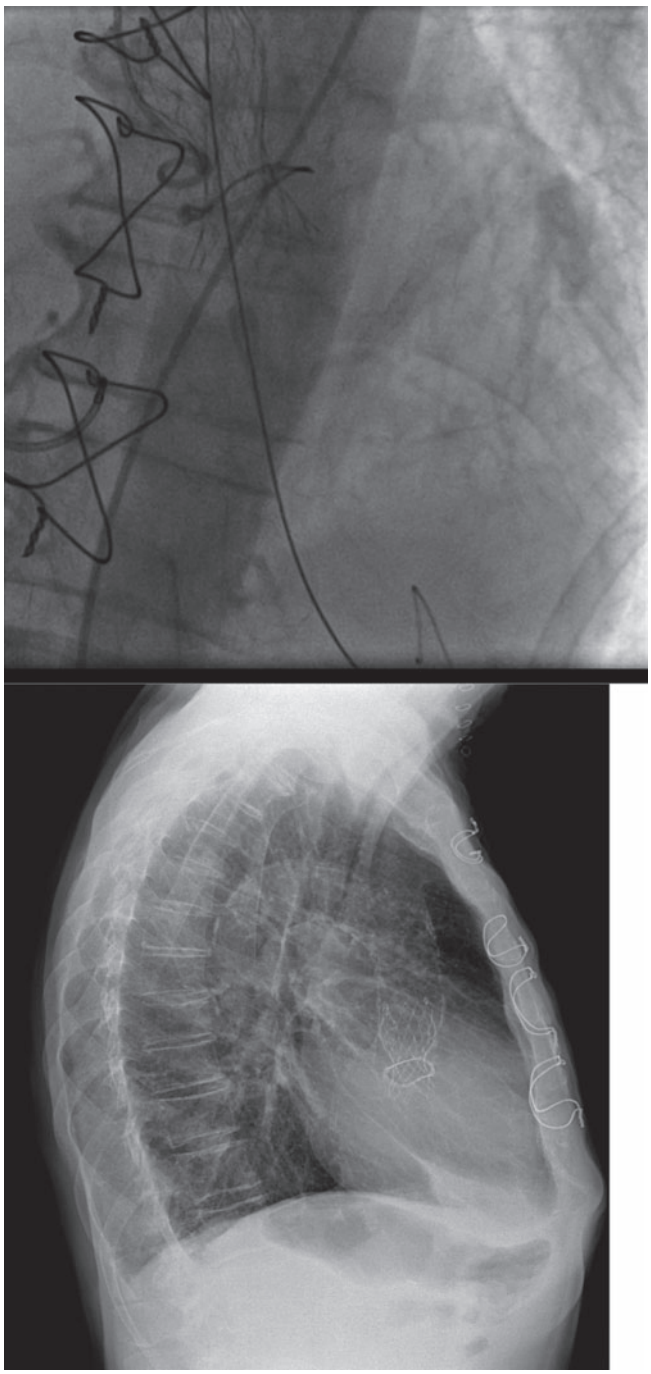

Figure 2. *Angiographic view of the introduction of the percutaneous aortic valve on the degenerated bioprosthesis and the result seen in the chest radiograph.*

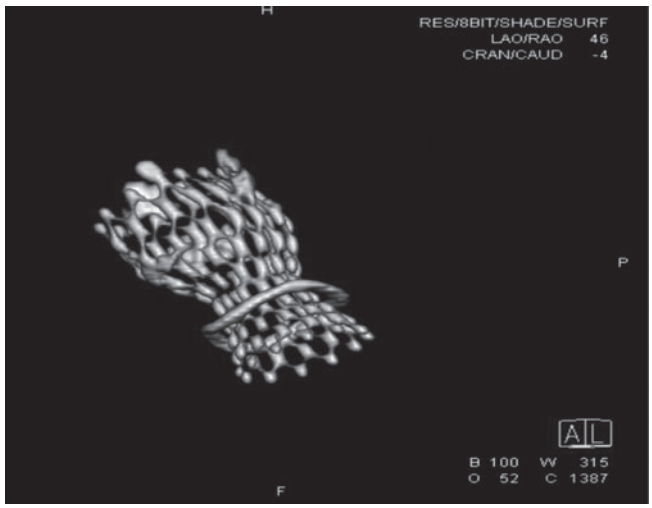

Figure 3. *Computed tomographic view of the percutaneous valve relative to the ring of the degenerated bioprosthesis.*

access and during an only short period of general anaesthesia. Importantly, as already mentioned above, the introducing sheath for the TAVI must only be advanced into the "Dacron chimney" and not further into the carotid artery to provide a sufficient antegrade flow throughout the whole procedure.[1,2]

Very limited experience exists with surgical access via the carotid artery. In a small series reported by Modine et al of 12 patients, the procedure was successful in all. There was no mortality, but 1 patient had a stroke , which mean that electroencephalogram monitoring in parallel to the procedure seems necessary to monitor cerebral perfusion.[3]

The median time for the implantation of the valve in valve is about 120 minutes in the European register.[3] For our case, it was 180 minutes with a fluoroscopy time of 36 minutes. This was explained by the initial implantation of the Dacron prosthesis.

For the valve in valve procedure the most common risk is the less optimal deployment of the percutaneous valve, secondary to calcifications usually present on the bioprosthesis especially if it is asymmetric,[3] Correct sizing is paramount, as undersizing may increase the risk of paravalvular regurgitation or valve migration whereas oversizing may lead to leaflet distortion within the transcatheter

heart valve, There is also often the need to implant a permanent pacemaker (5.7% to 20% for Corvalve) which remains the most common event described in the first 30 days with a positioning 2 to 6 mm below the base of the aortic annulus, which may interfere with the atrioventricular node, located very close to the aortic region and sub-membranous septum.[3,4]

Conclusion

The common carotid access has been demonstrated to be a feasible and safe access route for TAVI. It appears to be a valuable alternative access for patients who cannot undergo trans-femoral TAVI, to expand the benefit from this technology with less bleeding events, less access-related complications and immediate patient ambulation.

Disclosures

The authors declare that there is no conflict of interest.

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