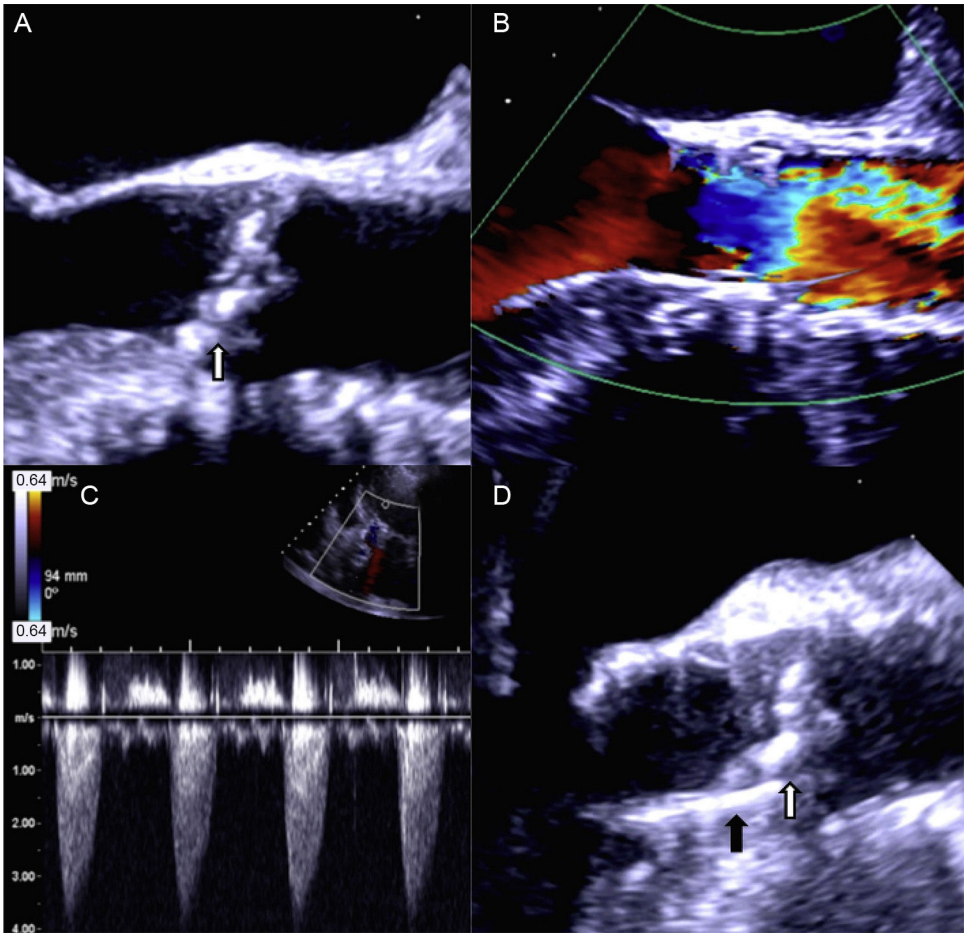

Figure 2. A, Echocardiographic images depicting preimplantation. B, Immediate postimplantation flow through prosthesis. C, Left ventricle-aorta gradient following prosthesis migration. D, Two-dimensional image of the prosthesis after migration. White arrow pointing toward native valve calcium. Black arrow pointing toward prosthesis.

SUPPLEMENTARY MATERIAL

Supplementary material associated with this article can be found in the online version available at doi:10.1016/j.rec.2016.08.003.

Miguel Nobre Menezes,[a,*] Pedro Canas da Silva,[a] Ângelo Nobre,[b] Eduardo Infante de Oliveira,[a] Pedro Carrilho Ferreira,[a] and Fausto J. Pinto[a]

[a]*Cardiology Department, University Hospital Santa Maria/Centro Hospitalar de Lisboa Norte/CCUL, Lisbon, Portugal*
[b]*Cardiothoracic Surgery Department, University Hospital Santa Maria/Centro Hospitalar de Lisboa Norte/CCUL, Lisbon, Portugal*

[*] Corresponding author:
E-mail address: mnmenezes.gm@gmail.com (M. Nobre Menezes).

Available online 15 September 2016

REFERENCES

1. Cao C, Ang SC, Vallely MP, Ng M, Adams M, Wilson M. Migration of the transcatheter valve into the left ventricle. *Ann Cardiothorac Surg.* 2012;1:243–244.
2. Clavel M-A, Dumont E, Pibarot P, Doyle D, De Larochellière R, Villeneuve J, et al. Severe valvular regurgitation and late prosthesis embolization after percutaneous aortic valve implantation. *Ann Thorac Surg.* 2009;87: 618–621.
3. Nkomo VT, Suri RM, Pislaru SV, Greason KL, Sinak LJ, Holmes DR, et al. Delayed transcatheter heart valve migration and failure. *JACC Cardiovasc Imaging.* 2014;7:960–962.
4. Prakash R, Crouch G, Joseph MX, Bennetts J, Selvanayagam JB, Sinhal A. Very late ventricular displacement of transcatheter aortic valve resulting in severe paravalvular regurgitation. *JACC Cardiovasc Interv.* 2014;7:e13–e15.
5. Showkathali R, Dworakowski R, MacCarthy P. Valve in valve implantation to prevent acute prosthetic valve migration in Transcatheter Aortic Valve Implantation (TAVI). *Indian Heart J.* 2015;67:598–599.

http://dx.doi.org/10.1016/j.rec.2016.08.003
1885-5857/

Transcatheter Aortic Valve Implantation in Patients With Arterial Peripheral Vascular Disease

Implante percutáneo transfemoral de válvula aórtica en pacientes con enfermedad arterial periférica

To the Editor,

Transcatheter aortic valve implantation (TAVI) via the transfemoral route appears to improve survival and cause fewer complications than transapical implantation. Whenever possible, the transfemoral route should therefore be the first choice.[1]

Table
Baseline Clinical and Procedural Characteristics

	1	2	3	4	5	6	7
Age, y	79	84	78	77	73	81	79
Sex	F	F	M	M	M	F	F
EuroSCORE (%)	19.6	6.8	14.2	7.7	36.4	7.3	6.4
Peripheral vascular disease	Yes	Yes	Yes	Trouser-like iliac stenting	Yes	No	Yes
Minimum femoral diameter, mm	4.3	4.7	4.8	2.4	3.8	5	5.5
Calcification score (1-4)	4	3	4	3	4	4	3
Previous heart surgery	Yes	Yes	Yes	No	Yes	No	No
Valve type	S3	S3	S3	S3	S3	XT	XT
Size	23	23	26	26	23	26	29
Sheath (Fr)	14	14	14	14	14	18	20
Complications	Advanta stent	No	No	No	TIA	No	No

F, female; Fr, French; M, male; S3, Edwards-SAPIEN 3 prosthetic valve; TIA, transitory ischemic accident; XT, Edwards-SAPIEN XT prosthetic valve.

Developments to facilitate peripheral access include the use of a contralateral guidewire[2] and the smaller profile and improved navigability of the new introducers. Together with increased operator experience, these advances have improved procedure safety and reduced the number and severity of vascular complications.[3]

The range of patients who can benefit from transfemoral TAVI has been extended by progressive reductions in the delivery system profile. However, in a high proportion of patients, the peripheral access route is below the minimum 5.5 mm diameter. These peripheral vascular disease patients often have comorbidities that increase surgical risk,[4] and consequently are either excluded from surgery or undergo intervention associated with a very high mortality rate.[5] This high risk profile makes transfemoral TAVI an especially attractive strategy in these patients.

Here, we describe our experience with transfemoral TAVI in patients with severe peripheral vascular disease and artery access diameter < 5.5 mm. A series of 57 consecutive patients underwent transfemoral TAVI with an expandable balloon prosthesis (Edwards-SAPIEN XT in the first 9 patients and Edwards-SAPIEN 3 in the remaining 48).

In total, 7 patients undergoing transfemoral TAVI had arterial access < 5.5 mm (12.3%). All 7 patients had major comorbidities, and 4 had a history of heart surgery. The mean EuroSCORE for these patients was 14.1 ± 11.1 (Table).

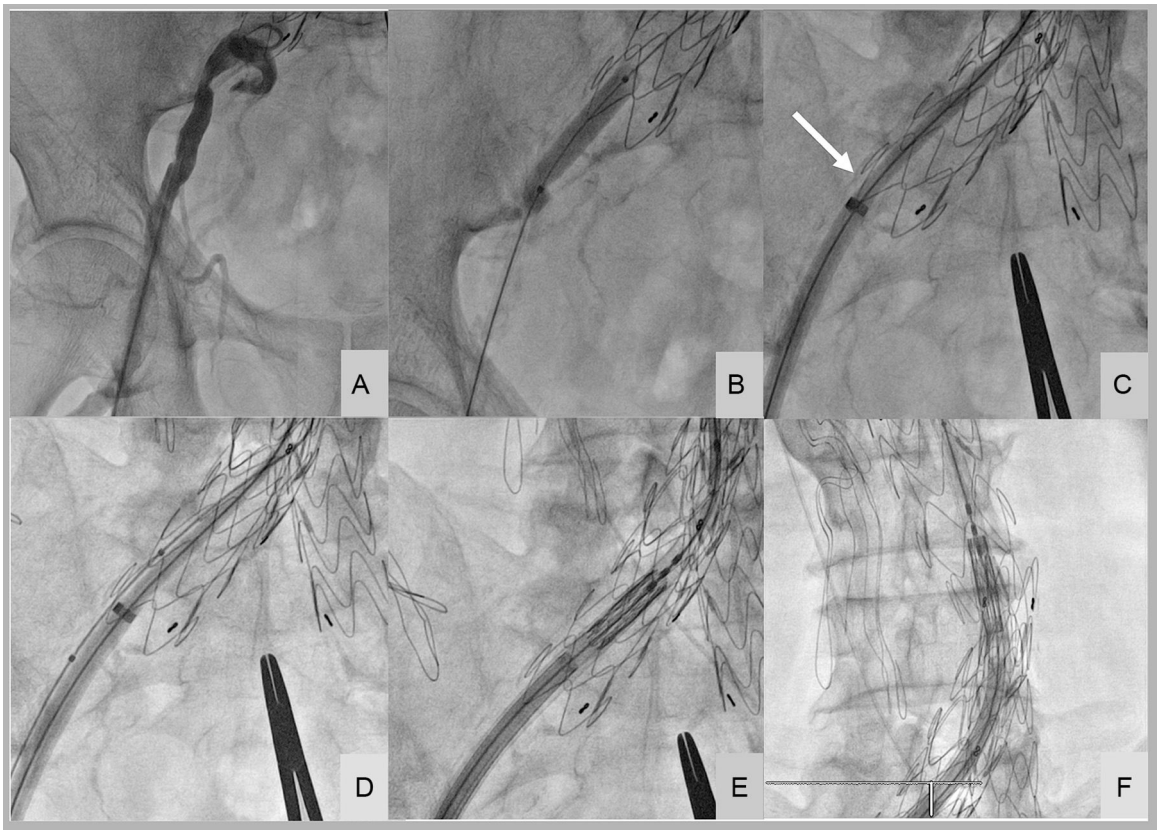

Figure. Implantation of an aortic valve prosthesis in a patient with peripheral vascular disease and trouser-like stenting at the iliac bifurcation. A: initial right femoral angiography. B: balloon angioplasty at the distal iliac border of the stent. C: collision of the introducer sheath with the distal-most extreme of the right iliac stent (arrow). D: buddy balloon technique for sheath introduction. E and F: valve introduction into the abdominal aorta.

In all patients except 1, a guidewire was introduced from the contralateral femoral artery, as described previously.[2] In 4 patients, balloon angioplasty was carried out at the start of the procedure at the level of the left or right common iliac artery; the procedure was performed with an 8 × 40 mm Wanda balloon (Boston Scientific, Ratingen, Germany) in 3 patients and with a nonexpandable 5 × 15 mm Euphora balloon (Medtronic) in the other patient.

In 3 patients, we also took advantage of the dynamic expansion mechanism available with the Edwards eSheath and the Novaflex + delivery system: the whole system was withdrawn to a region of wider diameter as the valve was advanced, allowing introduction of the delivery system through the narrower segment.

In 1 patient with severe peripheral vascular disease and trouser-like stenting at the iliac bifurcation, the distal iliac border of the stent was supported by balloon angioplasty during sheath introduction (Figure). In all patients, percutaneous closure was achieved with the Prostar XL system (Abbott Vascular; Santa Clara, California, United States). In 1 patient, active bleeding was observed at the end of the procedure; the failure of the Prostar XL system in this patient was likely due to large-scale vessel calcification impeding wound suturing. The hemorrhage resolved immediately upon implantation of a 10 × 38 mm Advanta v12 polytetrafluoroethylene-coated stent (Atrium Medical Corp; Hudson, New Hampshire, United States). In another patient, with moderate bleeding, internal hemostasis was restored by prolonged inflation of the balloon used for predilation. In all patients, outcome was monitored by angiography from the contralateral femoral artery. There were no major intraprocedural complications, and patients were discharged from hospital 3.5 ± 4.3 days after the procedure.

In the only previous report of transfemoral TAVI with narrow femoral access, predilation was used in 17 patients, resulting in 6 cases of iliac dissection.[6] In our series, there were no dissections; however, this might reflect the predominant use of the latest generation Edwards-SAPIEN 3 prosthesis, which is introduced through a narrow-bore and highly compliant sheath. When treating patients with difficult femoral access, contralateral guidewire placement is essential to ensure immediate and effective access in the event of complications.

With appropriate planning and familiarity with established percutaneous techniques, transfemoral TAVI is a safe and effective procedure in patients with small diameter femoral access.

Leire Unzué,[a,*] Eulogio García,[a] Rodrigo Teijeiro,[a] Miguel Rodríguez del Río,[b] Jorge Solís,[a] and Belén Rubio Alonso[a]

[a]*Servicio de Cardiología, Hospital Universitario Madrid Montepríncipe, Madrid, Spain*
[b]*Servicio de Anestesiología, Hospital Universitario Madrid Montepríncipe, Madrid, Spain*

*Corresponding author:
E-mail address: leireunzue@yahoo.es (L. Unzué).

Available online 22 November 2016

REFERENCES

1. Biancari F, Rosato S, D'Errigo P, et al. Immediate and intermediate outcome after transapical versus transfemoral transcatheter aortic valve replacement. *Am J Cardiol.* 2016;117:245–251.
2. García E, Martín-Hernández P, Unzué L, Hernández-Antolín RA, Almería C, Cuadrado A. Usefulness of placing a wire from the contralateral femoral artery to improve the percutaneous treatment of vascular complications in TAVI. *Rev Esp Cardiol.* 2014;67:410–412.
3. Sari C, Ayhan H, Aslan AN, Durmaz T, Keleş T, Baştuğ S. Predictors and incidence of access site complications in transcatheter aortic valve implantation with the use of new delivery systems. *Perfusion.* 2015;30:666–674.
4. Criqui MH, Ninomiya JK, Wingard DL, Ji M, Fronek A. Progression of peripheral arterial disease predicts cardiovascular disease morbidity and mortality. *J Am Coll Cardiol.* 2008;52:1736–1742.
5. Kapadia SR, Tuzcu EM, Makkar RR, Svensson LG, Agarwal S, Kodali S. Long-term outcomes of inoperable patients with aortic stenosis randomly assigned to transcatheter aortic valve replacement or standard therapy. *Circulation.* 2014;130:1483–1492.
6. Ruparelia N, Buzzatti N, Romano V, Longoni M, Figini F, Montorfano M. Transfemoral transcatheter aortic valve implantation in patients with small diseased peripheral vessels. *Cardiovasc Revasc Med.* 2015;16:326–330.

http://dx.doi.org/10.1016/j.rec.2016.10.008
1885-5857/

"Subclinical" Leaflet Thrombosis in Transcatheter Aortic Valve Implantation: A Latent Risk?

Trombosis valvular "subclínica" tras implante percutáneo de válvula aórtica: ¿un riesgo latente?

To the Editor,

An 87-year-old man with symptomatic severe aortic valve stenosis and a previous percutaneous coronary intervention in the right coronary artery underwent transcatheter aortic valve implantation (TAVI) with a balloon-expandable prosthesis (Edwards Sapien XT). No complications were detected during the procedure guided by transesophageal echocardiography (TEE) (Video 1 of the supplementary material). Posterior transthoracic echocardiography (TTE) demonstrated a normal mean transvalvular gradient (Figure 1A-1B). The patient was discharged with antithrombotic treatment consisting of aspirin 100 mg/d indefinitely and clopidogrel 75 mg/d for 3 months. One year later, the patient was admitted with inferior ST-segment elevation myocardial infarction and underwent coronary angiography, which showed an abrupt obstruction in the distal part of the posterior descending segment of the right coronary artery, with the typical angiographic appearance of coronary embolism (Figure 1C). Percutaneous coronary intervention was performed with a low profile balloon inflated at very low atmospheres due to the small diameter of the vessel segment where the embolus had stopped (Figure 1D). No evidence of atrial fibrillation during follow-up or hospitalization was observed. Nevertheless, an aortic systolic murmur was detected on exploratory evaluation, with no anemia on laboratory tests or clinical signs of infection. Postprocedural TTE showed an increase in transvalvular aortic gradients compared with a previous study (Figure 2A). The TEE showed an increase in the thickness of the 3 leaflets with restricted motion compared with the previous echocardiographic study, and an aortic valve area of 1.1 cm^2 assessed by planimetry (Figure 2B-2D, and Video 2 of the supplementary material). With a suspected diagnosis of subclinical leaflet prosthetic thrombosis, anticoagulation consisting of acenocoumarol was initiated. Three months later, a follow-up TTE and TEE showed normal transvalvular aortic gradients (Figure 2E) with thinning of the 3 valvular leaflets (Figure 2F-2H, and Video 3 of the supplementary material).

Subclinical leaflet thrombosis in TAVI has been reported in 3% to 4% of patients with balloon-expandable prostheses beyond the first month postprocedure,[1,2] and also in other types of TAVI