

## Conduction Abnormalities and Pacemaker Implantations After SAPIEN 3 Vs SAPIEN XT: Depending on Who Is Implanted and How You Implant. Response



**Trastornos de la conducción e implante de marcapasos tras implante de SAPIEN 3 comparada con la SAPIEN XT: según a quién se trata y cómo se implanta. Respuesta**

### To the Editor,

We have read with interest the letter by Rodríguez-Olivares et al. regarding our article “Conduction Abnormalities and Pacemaker Implantations After SAPIEN 3 Vs SAPIEN XT Prosthesis Aortic Valve Implantation”.<sup>1</sup> The authors point out that discussion of the clinical impact of the study lacked 2 features: depth of implantation and exclusion of patients with preprocedural right bundle branch block.

While it is true that in the present article, and stated in the limitations section, we did not include and analyze the issue of implantation depth on the incidence of permanent pacemaker implantation (PPI) or new onset conduction abnormalities, we kindly direct attention toward the fact that information of preexistent conduction abnormalities and the association with PPI were indeed included in our article. For the analysis of new PPIs after transcatheter aortic valve implantation, only patients with a previous pacemaker were excluded. We found that patients requiring PPI had less normal conduction, more complete right bundle branch blocks, and a longer QRS interval at baseline (see Results section of our article).<sup>1</sup> In the discussion, we cite the meta-analysis regarding the importance of pre-existing complete right bundle branch blocks for PPI after transcatheter aortic valve implantation.

In conclusion, we regard our article as an initial experience and further research on potential underlying mechanisms and possible strategies to reduce the incidence of PPI with transcatheter aortic

valve implantation using novel devices are clearly warranted. Additionally, we completely agree with Rodríguez-Olivares et al. that the issue of “device-host-interaction” is highly important and that there may not be one transcatheter heart valve fitting all patients.

### CONFLICTS OF INTEREST

C. Hengstenberg is a proctor for Edwards Lifesciences and Symetis. O. Husser has received minor congress travel fees from Edwards Lifesciences.

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### REFERENCE

- Husser O, Kessler T, Burgdorf C, Templin C, Pellegrini C, Schneider S, et al. Conduction Abnormalities and Pacemaker Implantations After SAPIEN 3 Vs SAPIEN XT Prosthesis Aortic Valve Implantation. *Rev Esp Cardiol.* 2016;69:141–8.

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## Coronary Obstruction During Transcatheter Aortic Valve Replacement: Related to Calcification or Thrombus?



**Obstrucción coronaria durante el implante percutáneo de válvula aórtica: ¿relacionada con calcificación o con trombo?**

### To the Editor,

We read with great interest the recently published article by Mori Junco et al.<sup>1</sup> This is a very interesting case successfully treated with thrombus aspiration and balloon dilatation. However, some issues require further discussion.

Although coronary thromboembolism during transcatheter aortic valve replacement (TAVI) is a rarely encountered complication, it may lead to life-threatening problems primarily due to acute myocardial infarction. The optimal treatment is percutaneous coronary intervention with angioplasty and stenting if necessary. Percutaneous coronary intervention may be a lifesaving strategy, especially in thromboembolism at the proximal coronary arterial tree. In the present case, a 74-year-old man had an acute myocardial infarction due to distal left main coronary thromboembolism during TAVI. TAVI is an alternative and effective treatment in patients with severe symptomatic aortic stenosis and high surgical risk.<sup>2,3</sup> Even though TAVI is a less invasive treatment than surgical aortic valve replacement, some serious

complications may develop. Some of these are aortic rupture,<sup>4,5</sup> early aortic valve thrombosis, and peripheral and neurological embolization of aortic valve calcium following TAVI. In the present case, the 74-year-old man had a predisposition to thrombus formation related to hypertension, type 2 diabetes mellitus, diabetic nephropathy, and chronic alcoholic liver disease. Moreover, the authors state that 2 drug eluting stents had previously been implanted in the left anterior descending artery. Regarding drug eluting stent implantation, we wonder whether or not the patient took dual antiplatelet therapy and unfractionated heparin before the TAVI procedure. We strongly believe that thrombus to the distal left main artery may be closely related to antiplatelet and anticoagulant treatment in the present case.

On the other hand, calcifications extending to the ascending aorta or left ventricular outflow tract may lead to some complications such as systemic embolism, aortic annulus rupture, or coronary embolism. In addition, a prosthetic valve during the implantation procedure may also damage and obstruct the ostium of the left main artery.<sup>6–9</sup> Lastly, laser aortic annulus and aortic root may be damaged iatrogenically at various levels during balloon inflation and valve implantation. Therefore, the landing zone of the valve and the direction of the annular calcification are very important to predict these complications.

Besides thrombus formation, residual calcification related to the natural valve is also a potential etiologic factor for embolism. Because of the potential catastrophic complications of TAVI,

patients should be closely followed-up by echocardiography during and after the procedure. On echocardiography, detection of thrombus formation on the implanted aortic valve is essential after TAVI and interventional cardiologist should promptly start antiplatelet and antithrombotic treatment after TAVI in those patients.

In conclusion, it is very important to be aware of this catastrophic event and all interventional cardiologists should take all preventive actions such as placing a guiding catheter in the left coronary ostium.

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## REFERENCES

1. Mori Junco R, Domínguez Melcon F, Moreno Yangüela M. Coronary Thromboembolism During Transcatheter Aortic Valve Replacement. *Rev Esp Cardiol.* 2015;68:893.

2. Chandrasekhar J, Hibbert B, Ruel M, Lam BK, Labinaz M, Glover C. Transfemoral vs Non-transfemoral Access for Transcatheter Aortic Valve Implantation: A Systematic Review and Meta-analysis. *Can J Cardiol.* 2015. <http://dx.doi.org/10.1016/j.cjca.2015.04.023>
3. Demirkol S, Ozturk C, Balta S, Unlu M. Right ventricular function in patients undergoing surgical or transcatheter aortic valve replacement. *Eur J Cardiothorac Surg.* 2015. pii: ezv307. [Epub ahead of print] No abstract available.
4. Ozturk C, Demirkol S, Demir M, Yildirim AO, Balta S, Celik T, et al. Mobile mass lesion in the aorta after transcatheter aortic valve implantation: Thrombus or residue calcification. *Int J Cardiol.* 2015;198:45–6.
5. Ilysoy A, Ozturk C, Demirkol S, Celik T, Aparci M, Demir M, et al. Aortic and right ventricular rupture in a patient after transcatheter aortic valve implantation; The direction of the calcification predicts aortic annulus rupture. *Int J Cardiol.* 2015;193:49–52.
6. Córdoba-Soriano JG, Puri R, Amat-Santos I, Ribeiro HB, Abdul-Jawad Altisent O, del Trigo M, et al. Valve Thrombosis Following Transcatheter Aortic Valve Implantation: A Systematic Review. *Rev Esp Cardiol.* 2015;68:198–204.
7. Ielasi A, Latib A, Montorfano M, Colombo A. Sandwich Stenting to Treat an Ostial Left Main Narrowing Following Transcatheter Aortic Valve Implantation. *Rev Esp Cardiol.* 2011;64:1220–2.
8. Dağdelen S, Gök H, Alhan C. Acute left main coronary artery occlusion following TAVI and emergency solution. *Anatol J Cardiol.* 2011;11:747–8.
9. Ergene O, Emren V, Duygu H, Eren NK. A case of occurring hemodynamic deterioration and ST-segment elevation during transcatheter aortic valve implantation. *Turk Kardiyol Dern Ars.* 2014;42:556–9.

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## Coronary Obstruction During Transcatheter Aortic Valve Replacement: Related to Calcification or Thrombus? Response



### Obstrucción coronaria durante el implante percutáneo de válvula aórtica: ¿relacionada con calcificación o con trombo? Respuesta

#### To the Editor,

We appreciate the comments of Ozturk et al on our publication entitled, “Coronary Thromboembolism During Transcatheter Aortic Valve Replacement”.<sup>1</sup>

The case in question concerned a patient with high thromboembolic risk who received 2 drug-eluting stents in the anterior descending artery during coronary angiography 1 month before the valve replacement procedure. The patient received dual antiplatelet therapy after the angioplasty and, later, unfractionated heparin during the transcatheter aortic valve implantation to maintain an activated clotting time between 200 and 250 s. Thus, the patient received complete antithrombotic therapy despite a high risk of bleeding (hypertension, diabetic nephropathy, and chronic alcoholic liver disease). We do not know if there were fluctuations in the anticoagulation level during the procedure. After the implant, the patient continued to receive dual antiplatelet therapy. Although coronary thromboembolic complications during aortic valve implantation are infrequent (around 1%<sup>2</sup>), they can be catastrophic<sup>3</sup> and thus require urgent treatment.

Calcifications in the left ventricular outflow tract, the native aortic valve itself, and the ascending aorta can lead to certain complications.<sup>4–6</sup> Another possible complication to bear in mind is coronary embolism of calcified material. In our patient, the

presence of an intracoronary thrombus was revealed using a thromboaspiration device. Because this device is designed to remove intravascular thrombi, it helped to achieve optimal myocardial perfusion.

Cases such as this one reinforce the need for adequate procedure-related antithrombotic therapy, in addition to transeptal echocardiography monitoring to permit early detection of complications requiring urgent management, as well as for other uses.

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## REFERENCES

1. Mori Junco R, Domínguez Melcon F, Moreno Yangüela M. Tromboembolia coronaria durante implante percutáneo de prótesis aórtica. *Rev Esp Cardiol.* 2015;68:893.
2. Seiffert M, Conradi L, Baldus S, Schirmer J, Blankenberg S, Reichenspurner H, et al. Severe intraprocedural complications after transcatheter aortic valve implantation: calling for a heart team approach. *Eur J Cardiothorac.* 2013;44:478–84.
3. Seiffert M, Schnabel R, Conradi L, Diemert P, Schirmer J, Koschyk D. Predictors and outcomes after transcatheter aortic valve implantation using different