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ORIGINAL ARTICLE

Echogenic mobile images in intraprocedural three-dimensional transesophageal echocardiographic monitoring during percutaneous aortic valve implantation: Incidence, characteristics and clinical implications

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KEYWORDS
Transcatheter aortic valve implantation;
Three-dimensional;
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Transaortic valve

Abstract
Introduction and Objectives: To investigate the incidence and clinical relevance of the presence of mobile echogenic images (MEI) during transesophageal echocardiography (TEE) for monitoring of transcatheter aortic valve implantation (TAVI).
Methods: Consecutive patients referred to our center for transfemoral or transapical TAVI were included. The procedure was monitored by three-dimensional (3D) TEE and images were analyzed by two independent experts. In-hospital follow-up was carried out and correlated with imaging findings.
Results: A total of 104 patients were included. MEI were visualized in 11 patients during the procedure (11%) and in over 50% of cases were identified as thrombi, however no differences in periprocedural stroke were found in follow-up.

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Conclusions: Visualization of MEI during 3D TEE monitoring of TAVI is relatively common (11%) and in over 50% of cases they are identified as thrombi. The clinical implications of this finding are uncertain, as despite their frequency, the incidence of clinical stroke in this patient population was no higher. 3D TEE is a useful tool for diagnosis of MEI and can alert the operator to their presence.

PALAVRAS-CHAVE
Implantação valvular aórtica percutânea;
3 D;
Estenose aórtica;
Válvula transaórtica

Monitorização de imagens ecogénicas móveis intraprocedimento pela ecocardiografia transesofágica 3 D durante a implantação valvular aórtica percutânea: incidência, características e implicações clínicas

Resumo
Introdução e objetivos: Investigar a incidência e relevância clínica da presença de imagens ecogénicas móveis (IEM), através de ecocardiografia transesofágica (ETE) durante a implantação valvular aórtica percutânea (TAVI).
Métodos: Foram incluídos doentes consecutivos referenciados para o nosso centro para realização de TAVI por via transapical ou transfemoral. Foi realizada a monitorização da ETE 3 D e as imagens foram analisadas por dois peritos individualmente. O seguimento foi realizado no hospital e foi correlacionado com achados de imagem.
Resultados: Foram definitivamente incluídos 104 doentes. Durante o procedimento foram visualizadas IEM em 11 pacientes (11%) e,em mais de 50% dos casos, foram identificadas como trombos, não tendo, no entanto, sido encontradas diferenças no seguimento dos doentes.
Conclusões: A visualização das IEM através da monitorização por ETE 3 D durante a TAVI é relativamente comum (11%) e, em mais de 50% dos casos, são identificadas como trombos. As implicações clínicas deste achado são incertas, porque apesar da sua frequência não há maior incidência de acidente vascular cerebral clínico nesta população de doentes. A ETE é uma ferramenta útil para o diagnóstico e pode alertar o operador da sua presença.

Introduction

Aortic stenosis (AS) is the most prevalent valvular disease in the Western world, and surgical valve replacement remains the standard treatment. However, approximately one third of patients are not referred or are rejected for surgical treatment due to high risk. In recent years, transcatheter aortic valve implantation (TAVI) has emerged as an alternative treatment for these patients.[1–3]

Different cardiac imaging techniques are essential in the proper selection of patients for TAVI, in intraprocedural monitoring and in subsequent follow-up. Of these techniques, transesophageal echocardiography (TEE) is very helpful for selecting prosthesis size, guiding valve positioning and release, checking the final result and detecting complications.[4–6] Moreover, three-dimensional (3D) TEE, due to its ability to characterize soft structures, has a growing role during percutaneous interventions of structural heart disease.

During all the steps of TAVI, mobile echogenic images (MEI) can be observed in some patients. These are defined as small mobile masses, mainly attached to catheters, after valvuloplasty or prosthetic vale implantation, or as remains of the former valve structure.

The aim of our study was to clarify the incidence and clinical significance of MEI detected by 3D TEE, as there are no specifically designed studies for this purpose.

Methods

Study population and procedure

One hundred and four consecutive patients referred to our center for TAVI were included. The device used in all cases was the Edwards SAPIEN prosthesis, and all procedures were performed under general anesthesia. A transfemoral approach was the first choice, although in cases with minimum peripheral vascular diameter <6 mm or excessive tortuosity implantation was performed by a transapical route.

In transfemoral procedures, surgical exposure of the femoral artery was performed in all except six cases and 100 IU/kg intravenous heparin was administered. Prior to valve implantation, balloon valvuloplasty was performed