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ORIGINAL ARTICLE

Percutaneous closure of periprosthetic paravalvular leaks: A viable alternative to surgery?

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KEYWORDS
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Abstract
Introduction and Objectives: Paravalvular leak (PVL) is a possible complication after prosthetic valve implantation. PVL can cause significant symptoms of congestive heart failure and/or hemolysis. Medical therapy is palliative and reoperation has a high mortality rate. Percutaneous transcatheter closure is a promising alternative for symptomatic patients at high surgical risk. We aim to review the efficacy and safety of percutaneous PVL closure in a consecutive series of patients referred to our center.
Methods: We performed a retrospective analysis of clinical and technical procedural data of patients referred to our center for percutaneous PVL closure between January 2009 and November 2015.
Results: Twenty procedures were performed in 18 patients under general anesthesia and under transesophageal echocardiographic and radiographic guidance. Fourteen mitral PVLs were successfully treated in 13 patients and one aortic PVL in one patient. Most (eight) of the PVLs closed were in mitral bioprostheses. Two patients underwent a second intervention, which was technically successful in one. Technical success was achieved in 15 (75%) of the procedures. At discharge, median NYHA functional class decreased by one and hemolytic anemia decreased from seven cases (38.9%) to two (11.1%). Two patients had minor bleeding at the femoral vascular access site. Survival rates at six, 12 and 24 months were 77.8%, 77.8% and 61.1%, respectively.
Conclusions: In our experience, percutaneous PVL closure was overall effective and safe. The procedure is complex and a second intervention may be necessary. Percutaneous PVL closure

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may be a feasible alternative for selected symptomatic patients at high surgical risk refractory to medical therapy.

PALAVRAS-CHAVE
Intervenção percutânea;
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Prótese valvular;
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Mitral

Encerramento percutâneo de regurgitações periprotésicas: uma alternativa viável à cirurgia?

Resumo
Introdução e objetivos: As regurgitações paravalvulares (RPV) constituem uma complicação da cirurgia de substituição valvular. Em alguns casos podem surgir sintomas de insuficiência cardíaca congestiva e/ou hemólise. A terapêutica médica é paliativa e a reoperação associa-se a elevada taxa de mortalidade. O encerramento percutâneo poderá ser uma alternativa para doentes com elevado risco cirúrgico. Pretendemos rever a eficácia e segurança do encerramento percutâneo de RPV numa série de doentes consecutivamente referenciados ao nosso centro.
Métodos: Análise retrospetiva de dados clínicos e dos procedimentos efetuados em doentes referenciados para encerramento percutâneo de RPV, de janeiro de 2009 a novembro de 2015.
Resultados: Vinte procedimentos foram efetuados em 18 doentes, sob anestesia geral, orientação radiológica e por ecocardiografia transesofágica. Foram tratadas 14 RPV mitrais com sucesso em 13 doentes e uma RPV aórtica. A maioria das RPV foram encerradas em biopróteses mitrais. Dois doentes foram submetidos a uma reintervenção, tecnicamente bem sucedida num deles. O sucesso técnico foi atingido em 15 (75%) dos procedimentos. À data de alta, a mediana de classe funcional NYHA diminuiu numa classe e a hemólise de sete (38,9%) para dois (11,1%) doentes. Dois doentes tiveram hemorragias *minor* nos locais dos acessos vasculares femorais. As taxas de sobrevivência aos seis, 12 e 24 meses foram 77,8, 77,8 e 61,1%, respetivamente.
Conclusões: A nossa experiência foi globalmente eficaz e segura. O procedimento é complexo e uma reintervenção pode ser necessária. Esta técnica poderá constituir uma alternativa para doentes selecionados, sintomáticos, de elevado risco cirúrgico e refratários à terapêutica médica.

Introduction

Paravalvular leak (PVL) is an uncommon but potentially serious complication after prosthetic valve implantation. PVLs consist of an abnormal communication between two cardiac chambers adjacent to a prosthetic valve and manifest as a regurgitant jet originating between the outer margin of the prosthetic valve and the native tissue surrounding it. They may be due to abnormal pressure or traction forces on the prosthesis after surgery, and several factors are known to increase the risk of PVL, including annular calcification, infection, suturing technique, size and shape of the prosthetic implant and tissue friability. Early PVL is usually related to technical aspects of the surgical implant, whereas late PVL commonly results from suture dehiscence caused by endocarditis or the gradual resorption of incompletely debrided annular calcifications.[1,2]

The incidence of PVL is estimated to be 2-10% after surgical aortic valve replacement and 7-17% after mitral valve replacement. Most PVLs are asymptomatic, but in 1-5% of cases they have severe clinical consequences, with symptoms of congestive heart failure (CHF), hemolysis, or both.[1,3]

Until recently, surgery was the standard treatment, despite the high morbidity and mortality associated with reoperation. Alternatives to surgical closure of PVLs have been pursued over the years and in 1992 the first report on percutaneous PVL closure was presented, proving that the principles of percutaneous techniques to close intracardiac shunts could be translated to percutaneous PVL closure.[1,2,4] Since then, percutaneous approaches to PVL closure have been developed as a less invasive strategy, through transseptal, apical left ventricular or retrograde arterial access, and a number of series have been published, with high rates of procedural success and favorable clinical outcomes.[5]

This study reports our experience with this technique, aiming to review the efficacy and safety of percutaneous device closure in a consecutive series of patients with clinically significant PVL referred to our center.