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ORIGINAL ARTICLE

Subcutaneous implantable cardioverter-defibrillator: Initial experience☆

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KEYWORDS
Ventricular tachycardia;
Ventricular fibrillation;
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Abstract
Background: Implantable cardioverter-defibrillators (ICDs) are important tools in the prevention of sudden death, but implantation requires transvenous access, which is associated with complications. Subcutaneous implantable cardioverter-defibrillators (S-ICDs) may prevent some of these complications.
Aim: To evaluate the therapeutics and complications associated with S-ICD systems.
Methods: S-ICD implantation was planned in 23 patients, for whom the indications were vascular access problems, increased risk of infection or young patients with long predicted follow-up. The population consisted of four patients with ischemic heart disease, three of them on hemodialysis (two with subclavian vein thrombosis), five with left ventricular noncompaction, four with Brugada syndrome, three with arrhythmogenic right ventricular cardiomyopathy, one with transposition of the great vessels, two with dilated cardiomyopathy and four with hypertrophic cardiomyopathy.
Results: S-ICDs were implanted in 21 patients, two having failed to fulfill the initial screening criteria. Mean implantation time was 77 minutes, with no complications. Defibrillation tests were performed, and in one patient the generator had to be repositioned to obtain an acceptable threshold.

In a mean follow-up of 14 months, 10 patients had S-ICD shocks, which were appropriate in half of them; one developed infection, one needed early replacement due to loss of telemetry and one patient died of noncardiac cause.

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Conclusions: S-ICD implantation can be performed by cardiologists with a high success rate. Initial experience appears favorable, but further studies are needed with longer follow-up times to assess the safety and efficacy of this strategy compared to conventional devices.

PALAVRAS-CHAVE
Taquicardia ventricular;
Fibrilhação ventricular;
Cardioversor-desfibrilhador implantável

Cardioversor desfibrilhador implantável subcutâneo – experiência de um centro

Resumo
Introdução: Os cardioversores-desfibrilhadores implantáveis (CDI) são ferramentas essenciais na prevenção de morte súbita. Requerem a utilização de acessos transversos com as inerentes complicações. O cardioversor-desfibrilhador totalmente subcutâneo (CDI-SC) pode prevenir algumas destas complicações.
Objetivo: Avaliação das terapêuticas e complicações associadas ao sistema.
População e métodos: Em 23 doentes houve intenção de implantar CDI-SC. As indicações foram: problemas com acesso vascular, risco de infeção aumentado ou jovens com previsão de prolongado tempo de seguimento. O dispositivo foi implantado em quatro doentes com cardiopatia isquémica, três deles em hemodiálise (dois destes doentes com trombose da veia subclávia). Em cinco jovens com ventrículo esquerdo não compactado, quatro com síndrome de Brugada, três com miocardiopatia arritmogénica do ventrículo direito, um com transposição dos grandes vasos, dois com miocardiopatia dilatada e quatro com miocardiopatia hipertrófica.
Resultados: Foi possível a implantação em 21 doentes. Dois doentes não apresentaram *screening* inicial do ECG de superfície compatível com vetores de desfibrilhação. O tempo médio de implantação foi 77 minutos, sem complicações. Foi efetuado teste de desfibrilhação; num dos doentes foi necessário reposicionar o gerador para obter um limiar aceitável.
Num seguimento médio de 14 meses, dez doentes apresentaram choques, sendo que em metade foram apropriados, um apresentou infeção do sistema, um teve necessidade de substituição precoce por perda de telemetria e um morreu por causa não cardíaca.
Conclusões: A implantação de CDI-SC é passível de ser efetuada por cardiologistas, com taxa de sucesso elevada. A experiência inicial parece favorável, mas são necessários estudos adicionais com tempos de seguimento mais longos para avaliar a segurança e eficácia desta estratégia em comparação com a convencional.

Introduction

Implantable cardioverter-defibrillators (ICDs) are effective in primary and secondary prevention of sudden death from ventricular arrhythmias.[1–4] Since the first ICD was implanted in the 1980s, technological advances and greater availability have led to a widening of clinical indications, which are specified in European Society of Cardiology guidelines on prevention of sudden death, cardiac devices and heart failure.[1,3]

These devices require transvenous access to implant one or more leads in the cardiac chambers.[5] Their weakest link is the transvenous pacing leads, which are associated with problems of implantation (thrombosis at the access site), longevity, infection and fracture, as well as acute procedure-related complications such as pneumothorax, hemothorax and cardiac tamponade.[6] Such complications are often responsible for inappropriate therapies or for preventing appropriate therapies, necessitating further intervention to replace the system. Despite technological advances in generators and leads in recent decades, the use of transvenous access for ICD implantation has a high morbidity rate.[6]

A defibrillator system has recently been developed that is totally extravascular, designed to reduce the morbidity associated with transvenous pacing leads. The present study describes our center's experience of this device in 21 patients with a mean follow-up of over one year.

Methods

Of a total of 1167 patients undergoing ICD implantation for primary or secondary prevention in our center between December 2008 and January 2013, 21 received S-ICDs.

Patient selection was based on the possible advantages of such a system for young individuals with a high probability of requiring system replacement and for patients with vascular access problems and/or high risk of infection.