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Prosthetic vascular graft infections: a center experience

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Abstract

Introduction: Prosthetic graft infection is a major complication of vascular surgery associated with high morbid-mortality rates. This retrospective non-randomized single center study evaluated our experience in the management of prosthetic vascular graft infections.

Methods: We review the clinical files of patients who had vascular grafts implanted at our center between June 2007 and December 2011 and analysed the cases that developed Samson group 3, 4 and 5 infections until December 2012.

Results: From June 2007 to December 2012, 18 consecutive patients (14 males, 4 females) with median age 70 years were admitted to our institution with the diagnosis of vascular graft infection accounting for an incidence of 3.8%. 50% of these infections were early infections and MRSA was the most prevalent pathogen. 44% of infections were due to infection of a femoro-popliteal bypass. Using Samson classification, 72% were group 4 and 5 infections. We performed graft preservation in one patient, graft excision without revascularization in 50% (nine) patients; Excision + insitu replacement in 39% (seven) patients; Excision + Extra-anatomic bypass in one patient. Our amputation rate was 55% and our related death rate was 16%.

Conclusions: Our amputation and mortality rates are according the published reviews. Besides allowing recognition of our reality this offers the opportunity to review diagnosis and therapeutic issues in prosthetic vascular graft infections. Each situation needs to be individualized as there is no consensus nor guiding algorithms about what should be the best medical treatment.

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PALAVRAS-CHAVE

Próteses vasculares;
 Infecção;
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 Tratamento cirúrgico

Infeções vasculares prótesicas: A experiência de um centro**Resumo**

Introdução: A infecção de enxertos protésicos vasculares é uma complicação grave da cirurgia vascular, cursando com altas taxas de morbimortalidade. Este estudo retrospectivo não randomizado, unicêntrico, avaliou a sua experiência na gestão de infecções de próteses vasculares. **Métodos:** Fez-se uma revisão dos processos clínicos das revascularizações protésicas vasculares realizadas no nosso centro entre junho de 2007 e dezembro de 2011 e selecionaram-se aquelas que desenvolveram infecções do grupo 3, 4 e 5 da classificação de Samson até dezembro de 2012. **Resultados:** Desde junho de 2007 a dezembro de 2012, 18 doentes (14 homens, 4 mulheres), com uma média de idade 70 anos, foram admitidos no nosso centro com o diagnóstico de infecções de próteses vasculares contribuindo para uma incidência de 3,8%. 50% das infecções foram precoces sendo o MRSA o patógeno mais isolado. 44% das infecções deveram-se a infecção de conduto femoro-poplíteo. Usando a classificação de Samson, 72% foram infecções grupo 4 e 5. Realizámos preservação do enxerto num doente, excisão da prótese sem revascularização em 50% (nove) doentes; Excisão + substituição in situ em 39% (sete) doentes; Excisão + bypass extra-anatómico num doente. A nossa taxa de amputação foi de 55% e a nossa mortalidade relacionada foi de 16%. **Conclusões:** As taxas de amputação e mortalidade da série estão de acordo com as revisões publicadas previamente. Para além de permitir reconhecer a nossa realidade esta publicação oferece a oportunidade de rever o diagnóstico e questões terapêuticas relacionadas com infecções de enxertos vasculares protésicos. Cada situação deve ser individualizada, pois não há consenso nem protocolos estabelecidos sobre qual deve ser o tratamento de eleição.

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Introduction

Prosthetic vascular graft infections (PVGI) are a catastrophic event associated with high morbidity and mortality rates.¹ Its incidence ranges between 1 and 6%. The death rate ranges between 15 to 75% with a rate of major amputation that may reach 70%.² Staphylococcus species are the most commonly implicated causative organisms,³ with *Staphylococcus aureus* more likely in early infection and coagulase-negative staphylococci such as *Staphylococcus epidermidis* more likely in late infections.⁴ The diagnosis of vascular graft infections is usually made on the basis of clinical findings, supported by radiological and microbiological investigations. As for infections of implanted material, it is recommended to replace the vascular prosthesis so as to eradicate the infection while preserving or restoring arterial vascularization. Various replacement vascular materials (in situ or extra-anatomic) are available such as antibiotic or silver coated vascular prostheses, autologous or heterologous venous or arterial grafts.² More recently, the trend has been to move away from graft removal to graft preservation with the use of vacuum assisted closure (VAC) devices, with or without muscle flap coverage more commonly employed.⁵ We examined our experience with infected prosthetic grafts after surgical bypass and the impact of postoperative graft infection on amputation rates and mortality.

Material and methods

In order to summarize our centre's experience, we retrospectively reviewed the clinical files of vascular graft

infections implanted at the department of Angiology and Vascular Surgery at Coimbra's University Hospital Center, from 01.06.2007 to 31.12.2011, and analysed the cases of PVGI identified until 31.12.2012. We defined a graft infection as clinical and laboratory evidence of infection associated with the presence of fluid directly communicating with the graft (in an imagiological or intra-operative view) or an exposed graft. We excluded arteriovenous and endovascular grafts; grafts implanted in another institution; bypass grafts performed for management of previous PVGI and infections categorized in Samson group 1 or 2. Once all the clinical files were identified, an individual detailed questionnaire was completed with the study data. Patient demographics, body mass index, comorbidities, indications for intervention, location of bypass, type of prosthetic material, case urgency, and previous ipsilateral bypass or percutaneous interventions were recorded as well as the timing of infection, diagnosis, bacteriology, treatment and outcome.

Results

Between 01.06.2007 and 31.12.2012, a total of 18 patients with PVGI that met the inclusion criteria were admitted to our department. During the study period 480 prosthetic grafts were implanted, accounting for a 3.8% incidence of PVGI (Tables 1 and 2). Subjects are ranged from 28 to 82 years (average age 70.4 ± 12.61 years) and the male/female ratio was 14:4. The most prevalent risk factors were Diabetes Mellitus (44%), tissue loss (44%), previous arterial puncture (44%) and previous ipsilateral incision (55%). Thirteen revascularization procedures were performed in

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