Interactive CardioVascular and Thoracic Surgery 17 (2013) 423–425
doi:10.1093/icvts/ivt195 Advance Access publication 10 May 2013

Heart transplantation in a patient with recurrent early extensive endocarditis

Diana M. Valencia Nuñez*, Carlos Merino Cejas, Pedro Alados Arboledas and Ignacio Muñoz Carvajal

Department of Cardiovascular Surgery, Hospital Universitario Reina Sofía, Córdoba, Spain

* Corresponding author. Dpto. Cirugía Cardiovascular, Hospital Universitario Reina Sofía, Calle Menendez Pidal S/N, 14005 Córdoba, Spain. Tel: +34 957-010148; fax: +34 957-012868; email: dianavalenciaes@yahoo.es (D.M. Valencia Nuñez).

Received 25 September 2012; received in revised form 17 February 2013; accepted 7 March 2013

Abstract

Active valvular endocarditis could be considered a contraindication to heart transplantation. Nevertheless, there have been some reports of success with this form of treatment, despite the characteristics of the infection and its aggressive nature. Here, we describe the case of a patient with acute bicuspid aortic valvular endocarditis caused by *Staphylococcus aureus* and with a periannular abscess. Cryopreserved aortic homograft replacement of the aortic root was initially carried out, in addition to debridement and reconstruction of the interventricular septum with a pericardial patch. Early recurrence occurred, however, with extensive tissue destruction, a periaortic abscess and involvement of multiple valves, associated with severe sepsis. In view of the failure of 'conventional' surgery, an emergency heart transplantation was decided on after discussing the case with the Spanish National Transplant Organization (ONT), because of the theoretical contraindication of transplantation in this case. Transplantation was finally carried out after a waiting period of 3 days, in emergency code conditions, and the postoperative course proved uneventful, with no reinfection during the follow-up period. The present case suggests that heart transplantation may be an alternative option in patients suffering aggressive endocarditis with extensive involvement of the heart structures.

Keywords: Endocarditis • Heart transplantation • Recurrent disease

INTRODUCTION

The surgical management of acute endocarditis characterized by extensive tissue damage is a major technical challenge, with morbidity and mortality rates close to 100% [1]. Heart transplantation may be the best alternative in special cases involving extensive infection, where 'conventional' surgery is considered to have few chances of success or has proved to be ineffective.

We report a successful case of heart transplantation in a patient with recurrent early extensive endocarditis.

CASE REPORT

A 28-year-old male stonemason, without history of drug abuse, was admitted for 10 days with a febrile syndrome, bilateral amaurosis with normal pupils and semi-consciousness. The computed tomography brain study proved normal. He subsequently suffered disorientation and slowed mental processing, and empirical treatment was started with doxycycline and gentamicin. The blood cultures proved positive for meticillin-resistant *Staphylococcus aureus*. Transthoracic echocardiography revealed aortic valvular endocarditis, with severe aortic insufficiency and a periannular abscess extending to the interventricular septum. The suspected portal of entry was skin wounds on the hands resulting from his professional work.

Surgery was carried out, with aggressive debridement of the necrotic tissue, reconstruction of the septum using an autologous pericardial patch and cryopreserved aortic homograft replacement of the aortic root. The postoperative course was initially satisfactory with use of the antibiotics daptomycin, cloxacillin and gentamicin (blood levels 1,17 mcg/ml); later we added rifampicin. The skin wounds on the patient's hands healed with local and systemic treatment.

Two weeks later, however, the patient developed fever and clinical sepsis; echocardiography showed the aortic homograft to be surrounded by abundant infectious material, which extended to the mitral and tricuspid valves. In addition, a fistula tract was observed, linking the left ventricle with the right atrium. The blood cultures proved positive to the same organism as before the operation.

In view of the failure of conventional surgical treatment with aggressive debridement and the use of totally biological material, the patient was included in the emergency transplant code, and heart transplantation was performed at 72 h (20 days after homograft placement). This was regarded as the best option for eliminating the septic focus, given the rapid evolution of the sepsis and extensive destruction of the endocardial structures.

Examination of the explanted heart showed that the purulent accumulation surrounded the entire homograft. The atrioventricular valves presented multiple vegetations (Fig. 1A), and the mitral–aortic junction showed several fistula tracts towards the septum and left atrium (Fig. 1B). Histological study revealed periaortic abscess, mitral and tricuspid endocarditis, and myocarditis of the left ventricle. The patient's progress was favourable after discharge, with the inmunosupression (mycophenolate mofetil,

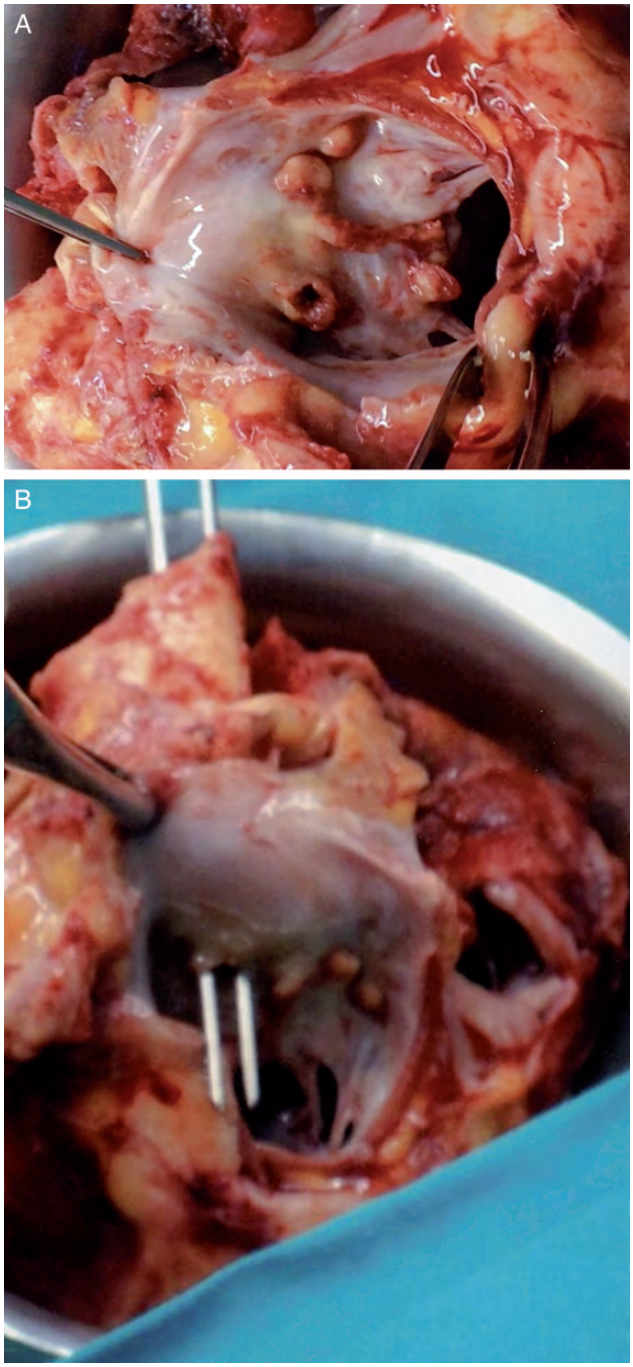

Figure 1: (**A**) The atrioventricular valves presented multiple vegetations. (**B**) The mitral–aortic junction showed several fistula tracts towards the left atrium.

tracolimus and deflazacort) and antibiotics for a further 2 weeks. One year later, the patient remains asymptomatic.

DISCUSSION

Despite the advances in antibiotic treatment, endocarditis continues to produce high rates of morbidity and mortality, particularly in the presence of aggressive micro-organisms and extensive destruction of endocardial structures. The surgical management of active infectious endocarditis, together with intensive antibiotic treatment, has yielded satisfactory results in many studies [1]. Approximately 40–50% of all cases of infective endocarditis require surgical treatment [1]. The most frequent surgical indications are heart failure, large vegetations, multiple systemic embolisms, myocardial abscesses and persistent sepsis [2, 3].

Surgical mortality in patients with active endocarditis is 6–25%, with a long-term survival rate of approximately 80% [1]. Prosthetic valve replacement is the most common surgical procedure; however, the use of cryopreserved homografts is the best option in patients with prosthetic endocarditis [2], as well as in cases of periannular abscesses with extensive involvement and annular destruction requiring ventricular–aortic reconstruction [3]. The recurrence rate of infection in patients subjected to aortic homograft surgery is low (3.8–6.8%) [2].

In some cases, such as that of our patient, the infection can be highly aggressive, with extensive destruction and involvement of multiple valves. Surgery in these cases presents major technical difficulties and multiple complications, mainly as a result of the recurrence of endocardial infection. Although there have been isolated reports of successful 'conventional' surgical treatments [3], these are associated with high risk and high rates of recurring endocarditis.

Following the failure of the first operation, it was considered that repeating multiple valvular surgery was not possible in this patient and was unlikely to prove effective in elimination of the septic focus, due to the large extent of infected endocardial tissue. Although the existence of active infection theoretically constitutes a contraindication to heart transplantation, the latter may be a valid option in certain cases characterized by extensive endocarditis. Heart transplantation is effective in fully eradicating the infectious focus, avoiding the use of complex surgical techniques and preventing the irremediable spread of the endocardial infection and sepsis.

When associated with aggresive specific antibiotic treatment and decrease of inmunosuppresion in inmediate postoperative period, transplantation can offer acceptable results in many cases superior to those afforded by any other management option, once an evolution of the disease similiar to our case has been reached [4, 5], even though it involves patients with 'chronic' prosthetic endocarditis with recurrent leakage, in which transplantation was mainly indicated due to congestive heart failure, in the absence of severe sepsis. Only in our case has the indication essentially been due to uncontrolled sepsis secondary to extensive endocardial destruction caused by aggressive micro-organisms in a young man, and the emergency heart transplantation was regarded as the only management option, despite its theoretical contraindication in such patients.

Heart transplantation in such circumstances may have ethical implications, given the theoretically limited possibilities of success, the contraindication of the technique in patients with active systemic infectious processes, and the high mortality rate among individuals who are waiting to receive an organ, given the scarcity of donors. These factors make it necessary to judge carefully whether to use organs in patients where transplantation has questionable indications or is potentially contraindicated.

The present case shows that in experienced centres, active infection might not be an absolute contraindication to heart transplantation. The intervening healthcare professionals and official organ transplant organizations must evaluate the true possibilities of success on an individualized basis in those patients for whom transplantation may be considered questionable or unsuitable.

Conflict of interest: none declared.

REFERENCES

[1] Byrne JG, Rezai K, Sanchez JA, Bernstein RA, Okum E, Leacche M *et al*. Surgical management of endocarditis: the Society of Thoracic Surgeons clinical practice guideline. Ann Thorac Surg 2011;91:2012–9.

[2] Perrotta S, Aljassim O, Jeppsson A, Bech-Hanssen O, Svensson G. Survival and quality of life after aortic root replacement with homografts in acute endocarditis. Ann Thorac Surg 2010;90:1862–7.

[3] Inoue H, Iguro Y, Kinjo T, Matsumoto H, Yotsumoto G, Sakata R. Acquired left ventricular-right atrial communication and severe aortic valve regurgitation caused by infective endocarditis. Thorac Cardiovasc Surg 2009; 57:54–6.

[4] DiSesa VJ, Sloss LJ, Cohn LH. Heart transplantation for intractable prosthetic valve endocarditis. J Heart Transplant 1990;9:142–3.

[5] Pulpón LA, Crespo MG, Sobrino M, Segovia J, Ortigosa J, Burgos R *et al*. Recalcitrant endocarditis successfully treated by heart transplantation. Am Heart J 1994;127:958–60.