Transpl Int (1998) 11: 387–389

BRIEF REPORT

Francisco Caballero
Antonio López-Navidad
Pere Domingo
Ricard Solà
Luis Guirado
Joan Figueras

Successful transplantation of organs retrieved from a donor with enterococcal endocarditis

Received: 3 February 1998
Received after revision: 24 March 1998
Accepted: 15 April 1998

F. Caballero · A. López-Navidad
Transplant Coordination Unit,
Hospital de la Santa Creu i Sant Pau,
Fundació Puigvert,
Universitat Autònoma de Barcelona,
E-08025 Barcelona, Spain

P. Domingo (✉)
Department of Internal Medicine,
Hospital de la Santa Creu i Sant Pau,
Avgda. Sant Antoni Mª Claret 167,
E-08025 Barcelona, Spain
Fax: + 34 3 291 9269
e-mail: pere.domingo@cc.uab.es

R. Solà · L. Guirado
Renal Transplant Unit,
Hospital de la Santa Creu i Sant Pau,
Fundació Puigvert,
Universitat Autònoma de Barcelona,
E-08025 Barcelona, Spain

J. Figueras
Liver Transplant Units,
Hospital de Bellvitge,
Universitat Autònoma de Barcelona,
E-08025 Barcelona, Spain

Abstract We report on a patient with an extensive cerebral infarction secondary to enterococcal endocarditis that, in spite of adequate antibiotic treatment, evolved to brain death. The patient was evaluated as a potential organ donor; renal and liver function were normal and both liver and kidneys appeared normal on ultrasonographic examination. When negativity of serial blood and urine cultures was ascertained, liver and kidneys were retrieved for transplantation. The organs were transplanted into three recipients with good results after 14 months of follow-up. All of the recipients received antibiotic prophylaxis against *Enterococcus faecalis*. None of them has presented infectious complications to date. This case emphasizes that patients with enterococcal endocarditis may be potential organ donors provided both donor and recipients are adequately treated. This is especially important when organs are urgently needed.

Key words Endocarditis, organ donor · Enterococcal endocarditis, kidney donor

Introduction

The presence of an infectious disease has classically been considered an absolute contraindication for organ retrieval from brain-dead patients because of the fear of transmitting the infection [4]. Thus, in recent epidemiological studies on brain death, organs from donors with bacterial endocarditis were not considered suitable for organ retrieval [3, 12]. However, the increasing need for organs, together with the finding that adequate antibiotic therapy to donor and recipient prevents the transmission of life-threatening infections, have prompted changes in donor criteria to include cadaveric organs from donors previously considered unacceptable. This has been the case when potential organ donors had syphilis [2] or died because of bacterial meningitis with or without septicemia [8]. We recently cared for a patient with enterococcal endocarditis who suffered brain death due to a massive cerebral infarction. His organs were transplanted into three recipients. None of the recipients had infectious complications.

Case report

A 29-year-old man was admitted to the hospital because of left hemiparesis and a decreased level of consciousness. Ten months before he had been diagnosed as having urethral stenosis that required inner urethrotomy. A neurological examination on admission disclosed a right dilated pupil with decreased light reflex and left hemiparesis. A cerebral CT showed an extensive ischemic le-

sion involving the right frontal, temporal, and parietal lobes. There was perilesional edema with signs of raised intracranial pressure. The patient had fever on the day of admission, and blood cultures grew *Enterococcus faecalis* sensitive to amoxycillin/clavulanate (MIC = 0.5 μg/ml), imipenem (MIC = 1 μg/ml), and vancomycin (MIC = 1 μg/ml). Urine culture was negative. The patient received amoxycillin/clavulanate for 3 days and imipenem for 1 day. Serial blood and urine cultures were negative. However, neurological status worsened, and 4 days after being admitted to the hospital, brain death was diagnosed. Blood pressure was 110/65 mm Hg and rectal temperature 37 °C. The leukocyte count was 20900/mm^3 with 87% neutrophils, 8% band forms, 4% lymphocytes, and 1% monocytes. Renal and liver function tests and hemostasis were normal. An echocardiogram disclosed a 2-cm vegetation on the mitral valve, together with inferior left ventricular achinesis. Abdominal ultrasound examination was normal. Nine hours after brain death was diagnosed, the kidneys and liver were retrieved. All of the organs appeared macroscopically normal. Postmortem examination disclosed three vegetations on the mitral valve, cultures of which grew *E. faecalis*.

The liver was transplanted into a 51-year-old man with postnecrotic cirrhosis. He received antithymocyte gamma globulin, cyclosporin A, and prednisone. Aztreonam and vancomycin were administered for 10 days after transplantation. The patient is doing well 14 months after transplantation with normal liver function tests and without having presented infectious complications to date.

The kidneys were transplanted into a 24-year-old man and a 31-year-old woman, respectively. They had been on hemodialysis because of chronic pyelonephritis. Both patients received antilymphocytic serum, prednisone, azathioprine, and cyclosporin A. Meropenem was administered for 10 days after transplantation in both recipients. Neither patient has presented any infectious complication to date, and 14 months after transplantation their creatinine levels were 90 and 150 μmol/l, respectively.

Discussion

To our knowledge, there has been no report of transplantation of organs retrieved from a brain-dead donor with endocarditis to date. Bacterial endocarditis is rarely complicated with brain death despite the fact that 11%–13% of patients with enterococcal endocarditis present with neurological complications [1, 5]. Most of them (70%–80%) are ischemic complications and usually precede the diagnosis of infective endocarditis [1, 7], whereas cerebral hemorrhages, cerebral abscesses, meningitis, and mycotic aneurysms occur in 5% of the patients [1, 13]. Cerebral infarction is far more frequent in patients with mitral valve endocarditis, as it was in our donor [1, 5, 7, 13]. Although brain death secondary to neurological complications of endocarditis may occur, its incidence has not yet been determined [6].

Enterococci cause between 5% and 20% of cases of infective endocarditis affecting normal valves, and 6%–7% of those affecting prosthetic ones [9, 11]. Metastatic infection, i.e., liver, renal, and pulmonary abscesses, are exceedingly rare in patients with enterococcal endocarditis [9, 10]. Our donor did not have evidence of metastatic infection, macroscopically or by ultrasound examination, in either his liver or his kidneys.

The most important issues to consider when facing a potential organ donor with an infectious condition are bloodstream invasion, the absence of infection in the potentially transplantable organs, the intrinsic virulence of the causative microorganism and, most important, the antimicrobial therapy received by the donor and recipient(s) [8]. In our donor there was bloodstream invasion by a moderately virulent agent, *Enterococcus faecalis*, without evidence of liver or kidney infection. In addition, the donor and recipients were treated with adequate antimicrobial therapy long enough to thoroughly assure blood sterilization. The latter factor most likely explains the success of organ transplantation from this donor.

Previous experiences indicate, and the present case confirms, that when considering a patient with brain death secondary to a treatable infectious condition as a potential organ donor, it is absolutely essential to have bloodstream sterilization assessed by repeated negative blood cultures (at least three) prior to organ procurement and an assessment of anatomical and functional integrity of the organs to be retrieved with negative cultures (i.e., urine cultures), when possible prior to organ retrieval [8]. In addition, patients with infections due to intracellular bacteria or to antibiotic-resistant microorganisms must not be considered as potential organ donors [8]. The duration of antimicrobial therapy to sterilize blood – not to treat the causative infection – may be variable but does not usually exceed 48 h [14]. However, it should be borne in mind that, in brain-dead patients, antibiotic therapy is primarily meant to avoid transmission of the infection to the recipients and to preserve the organs that are to be retrieved.

However, the crucial factor is administering adequate antibiotic prophylaxis to the recipient [2, 8]. First-choice antibiotic therapy for enterococcal endocarditis is the combination of a beta-lactam plus an aminoglycoside, although beta-lactam monotherapy is considered to be a feasible alternative regimen [14]. When retrieving organs from patients with enterococcal endocarditis, it seems advisable to administer antibiotic prophylaxis with ampicillin or vancomycin, with or without an aminoglycoside, to the recipients to further decrease the risk of transmitting the infection.

Our experience with the donor herein reported suggests that brain-dead patients with enterococcal endocarditis may still be suitable organ donors, especially when organs are urgently needed, provided that both donor and recipient(s) receive adequate antibiotic treatment against enterococcal infection. This may increase the pool of potential organ donors.

References

1. Almirante B, Tornos MP, Pigrau C, Gavaldá J, Pahissa A, Soler-Soler J (1994) Complicaciones neurológicas de la endocarditis infecciosa. Med Clin (Barc) 102: 652–656
2. Caballero F, Domingo P, Rabella N, López-Navidad A (1998) Successful transplantation of organs retrieved from a donor with syphilis. Transplantation 65: 598–599
3. Gore SM, Hinds CJ, Rutherford AJ (1989) Organ donation from intensive care units in England. BMJ 299: 1193–1197
4. Gottesdiener KM (1989) Transplanted infections: donor-to-host transmission with the allograft. Ann Intern Med 110: 1001–1016
5. Kanter MC, Hart RG (1991) Neurologic complications of infective endocarditis. Neurology 41: 1015–1020
6. Kulisevsky J (1997) Muerte encefálica por infarto encefálico. In: López-Navidad A, Kulisevsky J, Caballero F (eds) El donante de órganos y tejidos. Evaluación y manejo. Springer, Ibérica, Barcelona, pp 178–190
7. Lerner PI (1985) Neurologic complications of infective endocarditis. Med Clin North Am 69: 385–398
8. López-Navidad A, Domingo P, Caballero F, González C, Santiago C (1997) Successful transplantation of organs retrieved from donors with bacterial meningitis. Transplantation 64: 365–368
9. Mandell GL, Kaye D, Levison ME, Hook EW (1970) Enterococcal endocarditis. Arch Intern Med 125: 258–264
10. Mansur AJ, Grimberg M, Da Luz PL, Bellotti G (1992) The complications of infective endocarditis. Arch Intern Med 152: 2428–2432
11. Megran DW (1992) Enterococcal endocarditis. Clin Infect Dis 15: 63–71
12. Nathan HM, Jarrell BE, Broznik B, Kochik R, Hamilton B, Stuart S, Ackroyd T, Nell M (1991) Estimation and characterization of the potential renal organ donor pool in Pennsylvania. Transplantation 51: 142–149
13. Salgado AV, Furlan AJ, Keys TF, Nichols TR, Beck GJ (1989) Neurologic complications of endocarditis: a 12-year experience. Neurology 39: 173–178
14. Watanakunakorn C, Patel R (1993) Comparison of patients with enterococcal bacteremia due to strains with and without high-level resistance to gentamicin. Clin Infect Dis 17: 74–78