Endovascular treatment of transplanted renal artery stenosis with PTA/stenting

Trattamento endovascolare delle stenosi delle arterie renali trapiantate mediante PTA/stenting

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Abstract

Purpose. We evaluated the effectiveness of endovascular treatment with percutaneous transluminal balloon angioplasty (PTA)/stenting of transplanted renal artery stenosis (TRAS).

Materials and methods. Between January 2005 and December 2010, 17 patients (4 women, 13 men; mean age 60.9 years) with TRAS underwent PTA/stenting. The parameters analysed were: technical success, pre- and post-treatment serum creatinine (SCr) and blood pressure (BP), average number of antihypertensive drugs administered before and after treatment and vessel patency on colour Doppler ultrasound (CDUS) at 1, 3, 6 and 12 months and once a year thereafter.

Results. Technical success was 100%. During a mean follow-up of 28.3±18.7 months, there was a statistically significant reduction in SCr and BP values. In 18% of cases, moderate (<60%) restenosis was observed on CDUS without renal failure and not requiring new treatment. There was a reduction in antihypertensive drugs from an average of 3.5±0.5 to 1.5±0.5.

Conclusions. Consistent with the literature data, our experience shows that endovascular treatment with PTA/stenting is a safe and effective option for managing TRAS and can thus be considered the method of choice.

Keywords Transplanted renal artery stenosis · Endovascular treatment · PTA/stenting

Riassunto

Obiettivo. Scopo del nostro lavoro è stato valutare l’efficacia del trattamento endovascolare mediante angioplastica percutanea transluminale (PTA)/stenting delle stenosi dell’arteria renale trapiantata (TRAS).

Materiali e metodi. Da gennaio 2005 a dicembre 2010, 17 pazienti (4 femmine e 13 maschi; età media 60,9 anni) affetti da TRAS sono stati sottoposti a PTA/stenting. È stato valutato il successo tecnico della procedura e sono stati confrontati i valori di creatininemia e di pressione arteriosa, il numero di farmaci anti-ipertensivi somministrati prima e dopo il trattamento e la pervietà del vaso trattato mediante eco-color Doppler (ECD) a 1, 3, 6, 12 mesi e successivamente una volta l’anno.

Risultati. Il successo tecnico è stato del 100%; ad un follow-up medio di 28,3±18,7 mesi, si è osservata una riduzione statisticamente significativa dei valori di creatininemia e di pressione arteriosa. All’ECD nel 18% dei casi si è riscontrata re-stenosi di grado moderato (<60%), non associata ad alterazioni della funzionalità d’organo e non meritevole di nuovo trattamento. Si è passati da una assunzione di 3,5±0,5 farmaci anti-ipertensivi a 1,5±0,5.

Conclusioni. Nella nostra esperienza, in linea con i dati della letteratura, il trattamento endovascolare mediante PTA/stenting rappresenta un’opzione sicura ed efficace nella gestione della TRAS, costituendo la prima scelta terapeutica.

Parole chiave Stenosi arteria renale trapiantata · Trattamento endovascolare · PTA/stenting
Introduction

Renal transplantation is the treatment of choice in patients with chronic end-stage kidney failure, as it improves the recipient’s quality of life and ensures long-term survival [1]. The effectiveness of renal transplantation depends on the long-term function of the graft. Although the development of increasingly effective immunosuppressive therapies has reduced the incidence of acute and chronic organ rejection, 12–20% of transplanted patients developed either vascular or extravascular complications that may undermine long-term effectiveness [2]. The most frequent are vascular complications, which arise in 3–15% [2] of transplant patients and may cause loss of organ function [3]. The majority of these complications are transplanted renal artery stenosis (TRAS), arteriovenous fistulas, intra- or extrarenal pseudoaneurysms and thrombosis of the renal artery and/or vein. Since TRAS was first described in 1966, it has increasingly been reported as the main cause of refractory hypertension and kidney transplant failures [4]. Early diagnosis and adequate treatment are therefore essential for ensuring the survival of both the graft and the patient. The incidence of TRAS ranges from 1% to 23% [5], depending on the diagnostic criteria adopted in each centre and the routine use of colour Doppler US (CDUS). The introduction of magnetic resonance imaging (MRI) in clinical practice [6] has led to increasingly frequent and earlier diagnosis of TRAS. The standard treatment for TRAS was surgery, which has an effectiveness of 63–92% [7]. The rapid development of endovascular techniques in the past 10 years has also involved this clinical area, and endovascular surgery has become the treatment of choice for atherosclerotic renovascular conditions, including TRAS, as it ensures high technical success rates using a minimally invasive approach and provides adequate long-term patency and a lower complication rate compared with open surgery [8].

The purpose of this retrospective analysis of our experience was to evaluate the effectiveness of endovascular treatment of TRAS with percutaneous transluminal balloon angioplasty (PTA) and stenting using latest-generation materials and then compare it with data reported in the literature.

Materials and methods

Between January 2005 and December 2010, 17 patients with TRAS (13 men, 4 women) underwent endovascular treatment. The diagnosis of TRAS was based on: (1) new onset of arterial hypertension >140/90 mmHg unresponsive to medical therapy with two or more antihypertensive agents; (2) 20% increase of post-transplantation creatinine (Cr) levels; (3) CDUS abnormalities consisting of peak systolic velocity (PSV) >200 cm/s or >50% compared with the