

Abstracts of the VIth Renovascular Forum, London 2002

Transplant renal artery stenosis: treatment with balloon angioplasty and stent insertion

K S Blanshard, M Dixon, A Shiels, S Carr and M Nicholson

Department of Radiology, University Hospitals of Leicester NHS Trust, Leicester General Hospital, Gwendolen Road, Leicester LE5 4PW, UK

Purpose: To describe our experience of angioplasty and stent deployment to treat transplant renal artery stenosis.

Materials and Methods: 12 male patients with a mean age of 54.3 years and a mean age of transplanted kidney of 14.9 months were referred over a 2-year period for percutaneous transluminal angioplasty (PTA) and stenting. Following confirmation of a significant stenosis at selective arteriography, 11 patients received PTA and stent deployment and 1 patient was treated with PTA alone. Of the 11 patients who received a stent, primary stent deployment was used in 5 patients.

Results: There was 100% technical success. There was one minor per-operative complication successfully treated with a second stent. There were no other complications. All patients were discharged with a functioning renal transplant. At 1 month follow-up the mean serum creatinine had dropped from 302 to 126 mmol/l and mean blood pressure had dropped from 160/100 to 138/82 mmHg. At 12.3 months follow-up all patients have functioning renal transplants. No stenosis has been detected at duplex ultrasound follow-up to date.

Conclusion: Our experience compares well with the published data. Per-operative complications occur in up to 11% of cases, and the outcome after simple PTA carries a restenosis rate of up to 37%. Limited published data on outcomes after arterial stenting suggest a lower restenosis rate. So far our experience reflects this, although further follow-up is required.

PTA and stent deployment appears to represent a valuable tool in the management of transplant renal artery stenosis.

Cardiac assessment in atherosclerotic renovascular disease (ARVD)

J R Wright, A E Shurrab, A Cooper, R N Foley and P A Kalra

Departments of Renal Medicine and Cardiology, Hope Hospital, Stott Lane, Salford M6 8HD, UK

The prevalence of left ventricular hypertrophy (LVH) increases as renal function declines in the chronic renal failure population. ARVD is commonly associated with cardiovascular co-morbidities and patients have a high mortality, mainly of cardiovascular origin. 11% of patients with ARVD present with flash pulmonary oedema which is thought to be associated with LVH. Cardiac function in patients with ARVD has never been systematically studied.

64 patients with significant ARVD (RAS > 50% or occlusion), (36 M, 28 F, age (mean \pm SD) 70.2 ± 7.7 years, CrCl 37.2 ± 18.3 mls/min, 76.6% unilateral disease) underwent echocardiographic examination and 24-hour blood pressure monitoring. The relationships between the extent of renal artery lesions, renal function, blood pressure and left ventricular mass index (LVMI) were studied.

Patients exhibited a range of cardiac abnormalities; 76.7% had LVH, 56.2% had an abnormal left ventricular ejection fraction (<60%), 77.0% had left ventricular diastolic dysfunction evidenced by an abnormal mitral valve E : A ratio or E wave deceleration time or an abnormal intraventricular relaxation time. Mean \pm SD LVMI was 165.1 ± 49.7 g/m² for women and 182.0 ± 64.7 g/m² which is 65 and 40%, respectively, above the normal range.

There was no relationship between patency and the prevalence or extent of LVH. Grouped by CrCl (10–25, 26–50, >50 mls/min) patients with increasing severity of renal failure had significantly higher LVMI ($P < 0.05$). There was no correlation between systolic, diastolic or mean arterial blood pressure and LVMI, LV ejection fraction or LV diastolic dysfunction. In ARVD there is a significant increase in LVMI as CrCl falls which does not correlate with increasing blood pressure.

The key finding of this study is that the prevalence of LVH is greater in ARVD patients in all CrCl groups than that cited in the literature for the general chronic renal failure population.

Journal of Renovascular Disease (2002) 1, 12–13

DOI: 10.1102/1473-1827.2002.0005

Percutaneous renal artery angioplasty in non-atheromatous renal artery stenosis: technical results and outcome in 43 patients

R J Hughes, J Scoble and J F Reidy

Department of Radiology, Guys and St. Thomas' Hospitals, London SE1 9RT, UK

Purpose: To retrospectively review the technical and clinical results of percutaneous transluminal renal artery angioplasty (PTRA) for non-atheromatous renal artery stenosis (RAS) in a Tertiary Renal Referral Centre (adult and paediatric).

Materials and Methods: We reviewed 43 patients (including 9 children) who underwent PTRA for stenoses of 63 arteries over the period 1984–2001. Technical success was defined by the absence of a significant stenosis following angioplasty. There were 29 females and 14 males (age range 1–72 years, mean 37). The aetiology of the RAS was classical beaded FMD in 24, atypical or 'variant FMD' in 11, neurofibromatosis (NF) in 7 (Middle Aortic Syndrome associated in 4), and 1 Takayasu's Arteritis. Five NF patients who had angioplasty post surgical grafting were included.

Results: A technically good angiographic result was obtained in 34/34 arteries with 'classical' RAS, 9/13 atypical arteries, 11/15 arteries of NF patients and in the one Takayasu's case. The atypical FMD cases and some of the paediatric NF/MAS cases were associated with stenoses that were resistant to high pressure balloon dilatation. There was one major complication of arterial occlusion at 24 hours in a very severe atypical stenosis, which could not be dilated.

Follow up was obtained on 20/24 patients with typical FMD. 7/20 were normotensive off treatment (mean age 37 years), 11/20 were 'improved' on treatment and 2/20 were unchanged (mean age 52 years). In the atypical FMD cases follow-up was obtained on 6/11. 2/6 were normotensive off treatment and 4/6 improved on treatment.

In native artery PTRA in NF 1/3 was 'cured' post PTRA, and 2/3 failed. On post-surgical graft stenosis 1/4 patients was 'cured' and 3/4 improved.

Conclusion: Classical FMD responds well to PTRAs and the best clinical results are seen in younger patients. Atypical FMD especially in children and when associated with NF is less predictable but PTRAs should be attempted prior to surgery. Stenoses consequent to revascularisation surgery appear to respond well to angioplasty.

Journal of Renovascular Disease (2002) **1**, 13

DOI: 10.1102/1473-1827.2002.0006

Renal artery stenting in the management of patients with coronary heart disease

K. P. Balachandran and K. G. Oldroyd

Department of Cardiology, Hairmyres Hospital, Lanarkshire NHS Trust, East Kilbride, UK

Background: Renal artery stenting has been advocated as the accepted percutaneous approach for focal renal artery lesions secondary to atherosclerosis. Several centres have reported excellent procedural and short-term results but little is known about outcomes in patients with coexisting coronary artery disease and significant left ventricular (LV) dysfunction.

Design: Observational study with prospective follow-up (6 months).

Results: 14 patients with coronary heart disease underwent ostial and proximal renal artery stenting between 1998 and 2001. Ten patients had significant LV systolic dysfunction (EF < 45%). Bilateral renal artery stenting was performed in one patient. Procedural success was 100%. Significant procedure related complications occurred in 2 patients. There was 1 in-hospital and 3 follow-up deaths. The other patients have remained well with a 'cure' or an improvement in the clinical indication for the procedure. All patients who died had pre-existing significant renal impairment and impaired LV systolic function.

Conclusion: Renal artery stenting can be carried out with excellent technical success. However, short term outcomes are variable and depend upon the clinical indication. Urgent intervention, pre-existing significant renal impairment and LV systolic dysfunction are associated with unsatisfactory outcomes.

Journal of Renovascular Disease (2002) **1**, 13–14

DOI: 10.1102/1473-1827.2002.0007

A rare cause of renovascular hypertension?

P Chowdhury, J Reidy and J Scoble

Departments of Nephrology and Radiology, Guy's Hospital, London, UK

Takayasu's arteritis is a common inflammatory condition affecting the aorta and its main branches. Although the commonest cause of renovascular hypertension in South East Asia, Takayasu's arteritis is a rare diagnosis in the Western world, with an estimated incidence of 2.6 cases per million population in the United States. It is also classically a disease of young women, and rarely diagnosed in elderly patients. It has an early systemic phase, but is

more commonly diagnosed in its late phase. In this later ischaemic phase, symptoms and signs can be difficult to distinguish from atheromatous disease, which is prevalent in Western populations. Specific clues include distribution, variety of types of lesion (stenosis, aneurysm and calcification) and sparing of distal smaller vessels. However these features may not be evident unless adequate vascular imaging has taken place. This has been aided in part by the advent of magnetic resonance angiography (MRA), which is non-invasive and has been shown to be as sensitive as total aortography in picking up lesions. Its presentation also demonstrates regional variation, with Japanese patients presenting with symptoms as a result of disease in the thoracic aorta and upper limb blood vessels, in contrast to patients from the Indian subcontinent, in whom the abdominal aorta and its branches are more commonly affected. It has a long but unclear association with tuberculosis, with up to 70% of cases being tuberculin test-positive.

We present two cases of hypertension in Caucasian women as a consequence of renovascular disease. Both also had evidence of disease elsewhere and fulfill the diagnostic criteria for Takayasu's disease as defined by the American National Institutes of Health. Interestingly, both cases also had evidence of previous exposure to tuberculosis. We wish to show the radiological findings, especially the use of MRA.

We postulate that a significant proportion of cases of Takayasu's arteritis are going unrecognized, particularly in older Caucasian patients where atheromatous disease is statistically more likely. The diagnosis is of importance, as aggressive therapy with corticosteroids and surgical intervention can prevent occlusion of vessels and subsequently affect morbidity and mortality. In our second case we also demonstrate the use of angioplasty and stenting as an alternative to surgery for stenotic lesions as a result of this condition.

Journal of Renovascular Disease (2002) 1, 14

DOI: 10.1102/1473-1827.2002.0008

The effect of short term statin treatment on renal function in patients with peripheral vascular disease

F Youssef, A M Seifalian, D P Mikhailidis and G Hamilton

University Department of Surgery, Royal Free Hospital NHS Trust and Royal Free & University College Medical School, University College London, UK

Introduction: Initially intima media thickness (IMT) was measured after 8 weeks of atorvastatin treatment in the carotid (CCA) and femoral (CFA) arteries. Analysing the data showed a significant decrease in the serum creatinine levels. This prompted a retrospective study of statin therapy on creatinine and uric acid levels.

Methods: The IMT was measured the CCA and the CFA in 25 hyperlipidaemic patients (total serum cholesterol \geq 5.5 mmol/l) with peripheral vascular disease (PVD). The measurements were performed 8 weeks post-treatment with 20 mg/day atorvastatin.

Renal function profile was assessed retrospectively in 70 hyperlipidaemic patients with PVD before and after 2–3 months of treatment with simvastatin 20 mg/day. Patients with serum creatinine levels $>120 \mu\text{mol/l}$ were excluded from the study.

Results: CCA and CFA IMT significantly decreased after treatment ($P = 0.024$ and 0.0003) respectively. There was a small, but significant decrease in median serum creatinine levels after 8 weeks treatment: $87 \mu\text{mol/l}$ (range: 67–114) to $84 \mu\text{mol/l}$ (range 64–112), $P = 0.007$. Median serum uric acid value decreased from 0.33 (range 0.17–0.43) to 0.32 (range 0.19–0.40) mmol/l.

The median serum creatinine value decreased from 83.5 (range 64–120) to 80.5 (range: 50–116) $\mu\text{mol/l}$, which was significant ($P < 0.0001$). Similarly, median serum uric acid value decreased from 0.38 (range 0.24–0.64) to 0.34 (range 0.2–0.55) mmol/l, which was also significant ($P < 0.0001$).

Conclusion: Statins cause rapid decrease in the IMT after 8 weeks of treatment. Short term treatment with statin improves renal function in patients with established PVD. This may involve a complex action, which might include NO formation, the inflammatory process and affecting the microvascular circulation in the kidneys. However, more work is needed to define the clinical relevance of any such actions. Further study is needed on more severe degree of renal impairment.