SHORT REPORT

Percutaneous Angioplasty of the Radial Artery and its Deep Palmar Branch for Critical Hand Ischemia — A Case Report

A. Cremonesi*, E.C. de Campos Martins, A. Liso, S. Gieowarsingh, F. Castriota

Interventional Cardio-Angiology Unit, Department of Medical and Surgical Cardiology, Villa Maria Cecilia Hospital, Via Corriera 1, 48010 Cotignola (RA), Italy

Submitted 3 September 2008; accepted 14 January 2009

KEYWORDS
Angioplasty; Hand; Radial artery; Ischemia

Abstract Although balloon angioplasty (BA) has been extensively reported to treat peripheral artery occlusive disease, only little information is available about its use for critical hand ischemia. We report a case of a patient with painful ulcerated ischemic lesions of the right hand digits successfully treated by BA of the radial artery (RA) and its deep palmar branch (DPB). The 6-month angiographic follow-up showed a focal restenosis that was approached by a second BA session. Larger series are encouraged to determine the clinical outcome of percutaneous approach in this arterial district.

© 2009 Published by Elsevier Ltd on behalf of European Society for Vascular Surgery.
Open access under CC BY-NC-ND license.

Introduction

The atherosclerotic obstructive disease of forearm arteries causing critical hand ischemia is an infrequent entity1,2 and it has been basically approached with open surgery.3 Although balloon angioplasty (BA) has been extensively

Case Report

A 64 year-old man, with insulin-dependent diabetes mellitus, hypertension and dyslipidemia, presented to our hospital with painful ulceration of the right hand digits, with a remote history of amputation of the fifth right digit. Patient co-morbidity analysis demonstrated a severe background of coronary and peripheral arterial disease: a)
two episodes of myocardial infarctions; b) redo-coronary surgical revascularization; c) endarterectomy of both iliac arteries; d) multiple sessions of percutaneous intervention for lower limbs ischemia and; e) above the knee amputation of the right leg. An updated echocardiogram showed a low left ventricular ejection fraction (30%). Blood investigation revealed normal serum creatinine level.

Conventional angiography of the right upper extremity showed occlusion of the ulnar artery and a severe and diffuse disease of distal segment of the RA extending into the DPB with a total lesion length of 43 mm (Fig. 1). After discussing the case in a multidisciplinary panel (interventionalists and vascular surgeons) we decided to perform arterial revascularization with percutaneous approach due to patient co-morbidities and high surgical risk.

The procedure was carried out via right femoral artery. The right RA was catheterized with a 6-French multipurpose guiding catheter. A 0.014-inch hydrophilic guidewire was positioned in the deep palmar arch followed by predilation of the RA and DPB lesions with a 1.0/20 mm OTW balloon with usable length of 160 cm (Falcon CTO balloon, Invatec, Rocandelle, BS, Italy). Subsequently, a 2.5/80 mm OTW catheter-balloon with a usable length of 150 cm (Amphirion Deep balloon, Invatec, Rocandelle, BS, Italy) was positioned in the distal segment of RA and the DPB. A total of three balloon dilatations of five minutes each were carried out at a maximum pressure of 6 atm. The final angiogram confirmed a good result with residual stenosis <30%. After an uneventful recovery the patient was discharged home two days after the procedure.

Figure 1  (A) Severe and diffuse lesion of the radial artery and deep palmar branch (white arrows). Note the deep palmar arch (white arrows head), superficial palmar branch (black arrows) and superficial palmar arch (black arrows head); (B) A right oblique projection reveals a high origin of the superficial palmar branch (black arrows); (C) Angioplasty of the radial artery and its deep palmar branch with a 2.5 × 80 mm balloon, (D) Final angiographic result.

Figure 2  Six-month angiographic follow-up: (A) Focal restenosis of deep palmar branch is delimitated by the white circle. Distal radial artery and deep palmar branch (white arrows). Superficial palmar branch (black arrows); (B) Angioplasty of the radial artery and its deep palmar branch with a 2.0 × 80 mm balloon (white arrows); (C) Final angiographic result.
At 6-month follow-up the patient was asymptomatic and a complete healing of all digital ulcers was noticed. The angiographic control revealed a severe and focal restenosis at the DPB that was approached by a second BA session (Fig. 2) with a good final result.

Discussion

The upper extremity is less likely affected by critical ischemia in contrast to the lower extremity.\(^1\)\(^,\)\(^2\) Even in the presence of upper extremity ischemia, the forearm arteries are infrequently involved by arterial occlusive disease as compared to the subclavian, axillary and brachial arteries.\(^1\) In most large series of upper extremity ischemia only a very small percentage of patients are afflicted with symptomatic distal occlusive disease and this tends to be associated with end-stage renal failure.\(^1\) A conservative approach for treating hand ischemia is sufficient to maintain a reasonable quality of life in the majority of patients, but for the small group of patients with disabling-pain revascularization may prove to be beneficial. This therapy has almost always been undertaken with an open surgical strategy.\(^3\) However, the percutaneous approach has been recently proposed as an alternative therapy in this district.\(^4\),\(^5\)

In the present case we succeed twice in performing BA in arteries that are at the hand level, but as all new percutaneous strategies some basic questions must be tested and answered (as procedure technical success and restenosis rates) before to the definitive establishment as an alternative treatment. Larger series and longer follow-up are essential to establish the clinical outcome of the percutaneous treatment in this territory. We must have in mind that the goal of our treatment was to improve the patient quality of life by relief of severely disabling-pain and prevention of tissue-loss.

Conflict of Interest

None.

References