Percutaneous Transluminal Angioplasty for Treatment of Critical Hand Ischemia

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A 62-year-old man with insulin-dependent type II diabetes mellitus and chronic renal failure being treated with dialysis complained of chronic critical ischemia of the left hand with severe pain. A necrotic skin lesion with soft tissue infection and osteomyelitis of the distal part of the fourth finger was present (Figure 1A). A standard x-ray of the hand showed diffuse calcifications of the arteries (Figure 1B and 1C). An angiographic study was performed before therapeutic decisions were made. Homolateral antegrade brachial approach with an 11-cm 4F introducer sheath was used. No brachial lesions were present; the ulnar artery was functionally occluded in the distal part, whereas a series of critical stenoses of the radial artery associated with diffuse disease of the vessels of the hand was documented (Figure 1D). A percutaneous transluminal approach was attempted. Hand amputation was considered the ultimate therapeutic option. After the intra arterial administration of 100 mg of lidocaine (for a better pain control), a 0.014-inch soft coronary guide wire was gently advanced through the radial artery until the deep palmar arch was reached. By using a 2.5- to 80-mm peripheral balloon (Amphirion Deep, Invatec Inc, Brescia, Italy), the lesions were dilated at high pressure (15 bar) (Figure 2A). A good final angiographic result was obtained with immediate pain relief (Figure 2B). The patient was discharged the day after the procedure and 1 week later he underwent a planned surgical operation to remove the infected lesion of the finger by amputation. At an 8-month follow-up, the patient was asymptomatic and the surgical wound completely healed (Figure 2C).

In conclusion, in selected cases, a percutaneous transluminal approach could be considered an effective option for the treatment of critical hand ischemia. A successful procedure can avoid a major amputation.

Disclosures

None.
Figure 1. A, Critical ischemia of the left hand with a necrotic skin lesion on the distal part of the fourth finger. B, Standard x-ray of the hand (dorsal view) showing severe and diffuse calcification of metacarpal and digital arteries (arrows). C, Standard x-ray of the wrist showing heavy calcification of the ulnar (arrow) and radial arteries (asterisks). D, Baseline angiography illustrating diffuse disease of the forearm and hand arteries. There is total occlusion of the distal ulnar artery (arrow) and a series of critical lesions of the radial artery (arrows).
Figure 2. A, High-pressure inflation of the long balloon positioned in the radial artery up to the proximal part of the deep palmar arch. B, Final angiographic result with recanalization of the radial artery and deep palmar arch. C, Patient’s hand at 8-month follow-up. Complete healing of the surgical wound at the site of the amputation of the fourth finger is shown.