

Subintimal angioplasty without stenting on a patient with complex foot lesion

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ABSTRACT

Diabetic patients presenting with both peripheral vascular disease and complex soft-tissue defects are often treated by primary amputation. We report the case of a 66-year-old female patient with multiple comorbid conditions. She presented left foot plantar abscess and TASC C superficial femoral lesion. Endovascular revascularization of the left lower limb was performed employing the subintimal angioplasty technique, without stenting or endografting. This combined approach of lower limb revascularization associated with intensive care in diabetic foot wounds should always be considered before amputation. We recommend subintimal angioplasty as an option for high-risk patients with complex limb wounds.

Keywords: Subintimal angioplasty, lower limb, diabetic foot.

RESUMO

Pacientes diabéticos portadores de doença aterosclerótica ocliterativa periférica e lesões complexas de partes moles são frequentemente tratados por amputação primária. Os autores relatam o caso de paciente de 66 anos, sexo feminino, portadora de múltiplas comorbidades, apresentando volumoso abscesso plantar esquerdo e lesão femoral superficial conforme TASC C. Optou-se por realizar revascularização endovascular do membro inferior esquerdo por técnica de angioplastia subintimal sem o emprego de stent ou endoprótese. A abordagem combinada de revascularização endovascular do membro inferior associada a cuidados intensivos com feridas de pés diabéticos deve sempre ser considerada antes da amputação. Assim, sugere-se a técnica de

angioplastia subintimal como uma opção em pacientes de elevado risco cirúrgico portadores de feridas complexas nas extremidades.

Palavras-chave: Angioplastia subintimal, membro inferior, pé diabético.

Introduction

Diabetic patients with peripheral arterial occlusive disease and extensive soft tissue lesions are frequently treated by primary amputation. Limb revascularization associated with use of grafts and surgical flaps can increase salvation rates in these patients.¹

Use of subintimal angioplasty for the treatment of occlusive atherosclerotic lesions of the lower limbs was described for the first time by Bolia.²⁻⁵ Subsequent publications reaffirmed the effectiveness of this technique as an alternative to infrainguinal revascularization surgery.⁶⁻⁸ This article described a minimally invasive technique for the treatment of a patient with multiple comorbidities, critical lower limb ischemia and complex infected wound of the left foot.

Case report

A 66-year-old female patient with hypertension, dyslipidemia, diabetes mellitus, heart failure, coronary disease, and ischemic syndrome of the lower limbs progressed with flogistic signs in the left foot associated with pain and fever. At admittance to the emergency room, presence of voluminous plantar abscess was identified. The assessment performed by the clinical team determined surgical risk as IV according to the American Society of Anesthesiology (ASA IV). On physical examination, the patient had foot hyperemia associated with voluminous plantar mass with fluctuation, in addition to lymphangitis, extending until the distal third of the thigh, with palpable femoral pulses, and absent popliteal and distal pulses. *Arterial color-flow Duplex scan* showed presence of chronic segmental occlusion of the superficial femoral artery in the middle and distal thirds.

Venous hydration, platelet antiaggregation (acetylsalicylic acid 100 mg 1 x day), and antibiotic therapy (ciprofloxacin 1 g 12/12 h + amoxicillin and clavulanic acid 500 mg 8/8 h) were implemented, and the patient was referred to the surgical center for drainage of the plantar abscess, in which a voluminous cavity was seen extending through the whole plant until the metatarsal level ([Figure 1](#)).



Figure 1 - Left foot after drainage of the plantar abscess.

After clinical stabilization, choice was for endovascular revascularization of the left lower limb using the technique of subintimal angioplasty without stenting or endografting, as described by Bolia et al.² Arterial access was created through antegrade puncture of the left femoral artery, using an 18G puncture needle and inserting a 7F sheath according to the technique described by Seldinger. Arteriography was performed, confirming the lesions described by the Doppler ultrasound, compatible with the TASC C classification ([Figure 2](#)). The system for creating the subintimal channel was based on a KMP 35 catheter and 0.035" hydrophilic guide wire. The catheter was placed at the beginning of the occluded segment, and the guide wire was advanced in the subintimal space until crossing the occluded arterial segment, where it returned to the vessel lumen. We started angioplasty of the subintimal channel using 4 x 10-mm and 5 x 10-mm balloons. Angiographic control showed adequate outcome ([Figure 3](#)).

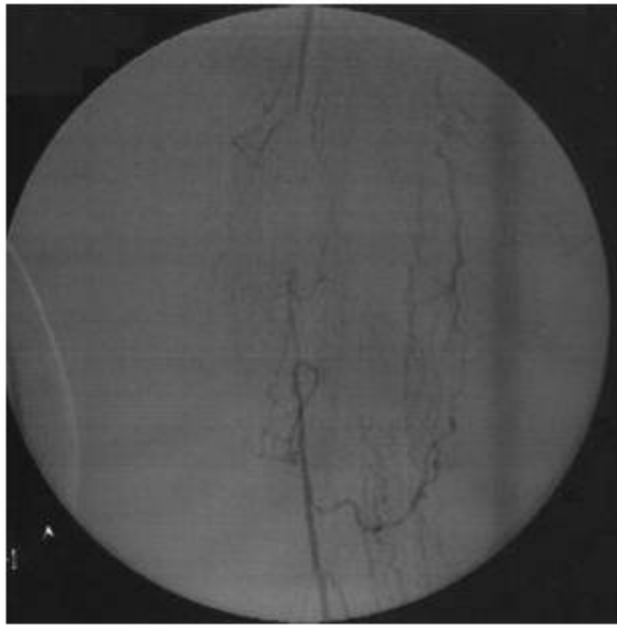


Figure 2 - Angiography showing segmental occlusion of the superficial femoral artery

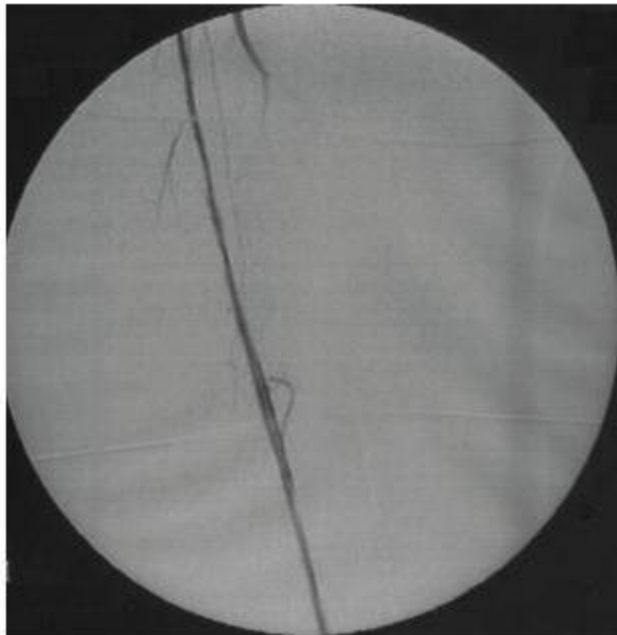


Figure 3 - Angiography showing the superficial femoral artery submitted to subintimal angioplasty without stenting

After revascularization, the hallux, second and third toes were amputated, and osteotomies of corresponding metatarsi were performed. In addition, the wound extending until the proximal plantar third was debrided ([Figure 4](#)).



Figure 4 - Left foot after debridement of devitalized tissue

Over a 6-month period, multiple debridements were performed, and there was change in wound aspect: the initially pale tissue was replaced by a granulation tissue. The wound margins were then gradually approximated until the much expected epithelization was achieved ([Figure 5](#)).



Figure 5 - Left foot aspect after wound epithelization

Discussion

The treatment of complex wounds of the diabetic foot is a great challenge for vascular surgeons. The evolution shown by this patient corroborates the high rates of limb salvation in series of subintimal angioplasty.^{[9-11](#)}

The patient had lymphangitis, which extended from the foot until the lower third of the thigh. This finding is a contraindication to revascularization by open technique, considering the potential complications of surgical wound. Some series of elective revascularizations of the lower limbs

reported high complication rates of surgical wounds.¹² Puskas et al. reported a 34% incidence of surgical wounds of the lower limbs submitted to saphenous vein stripping for myocardial revascularization.¹³

Subintimal angioplasty without stenting has been widely approached in the literature,¹⁻¹¹ and is corroborated by our case report.

Lower limb revascularization associated with intensive care in diabetic foot wounds provides major benefits for these patients, especially stable wound coverage and preservation of walking ability; therefore, it should always be considered before amputation. Thus, the subintimal angioplasty technique is recommended as an alternative in patients at high surgical risk with complex wounds in the limbs.

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