When is a Technically Successful Peripheral Angioplasty Effective in Preventing Above-the-ankle Amputation in Diabetic Patients with Critical Limb Ischaemia?

Reference:
Faglia, E., Clerici, G., Clerissi, J., Mantero, M., Caminiti, M., Quarantiello, A., et.al. (2007). When is a technically successful peripheral angioplasty effective in preventing above-the-ankle amputation in diabetic patients with critical limb ischaemia? Diabetic Medicine, 24(8), 823-829.

Scientific Literature Review
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PODIATRIC RELEVANCE:
The number of diabetic foot wounds is on the rise and although a large percentage of these lesions are neuropathic in origin, the presence of concomitant peripheral vascular disease greatly increases the risk of major limb amputation. The recent introduction of percutaneous transluminal angioplasty (PTA) is being used more widely to treat ischemic foot ulcers. PTA offers it’s a less invasive nature, is associated with less morbidity and mortality, and has greater cost effectiveness with shorter hospital stays. Is PTA enough to prevent major amputations in diabetic patients with limb ischemia? This article looks to determine parameters predictive of avoidance of amputations after successful PTA.

METHODS:
All diabetic patients referred to Diabetic Foot Centre because of a foot lesion or rest pain, were assessed for the presence of critical limb ischemia. Diagnosed if one foot pulse was reduced or absent, if ankle pressure was <70mmHg, and if transcutaneous oxygen tension (TcPO2) at the dorsum of foot was <50mmHg. In any patient with these abnormalities, a duplex scan exam and angiography were performed and if a vessel obstruction was >50%, PTA was done. Successful limb salvage after PTA was considered via disappearance of foot pain in those without a foot ulcer and if the patient was eventually able to weight bear through the plantar aspect of the foot (even if TMA was performed) in those with a foot lesion. Any major amputation (above ankle, below knee) within 30 days following a PTA was considered a failure.

RESULTS:
A successful PTA was performed in 420/564 patients (74.5%). 28 patients (6.6%) had >50% obstructions in the iliac-femoral-popliteal axis, 137 (32.6%) had obstructions in both supra and infrapopliteal axis and 255(60.7%) exclusively in infrapopliteal axis. After PTA, all 3 crural arteries were patent in 66 patients, 2 crural arteries in 143 patients and one in 186 patients and all 3 were occluded in 24 patients. Of 354 patients with foot ulcers, complete healing was achieved in 74 patients. Healing occurred in 80 patients after toe or ray amp, and in 178 after a TMA. 22 underwent major amputations, all of which had proximal and distal obstructions. 15 of the 22 had successful PTA only in fem-pop axis. 7 had successful PTA in fem-pop axis and peroneal artery. The peroneal artery was the only patent vessel. Those who underwent major amputations, TcPO2 did not change (p=0.082) and those without major amputations had TcPO2 increase significantly (p<0.001).

COMMENTS:
PTA has proven to be an effective and minimally invasive method to increase perfusion to the lower leg and foot. Even though this article was an analysis of case series, it demonstrates that it’s not always as important that a PTA was performed, but what vessel(s) and how many vessels the PTA was performed on. Major amputation increased up to eight times for each obstructed crural artery. It is critical to understand the severity of ischemia using tools like TcPO2 but it is more so to consider how much blood flow is enough in order to heal these ischemic foot lesions and if there is more that can be done.