

Frequent Amputations without Even Undergoing a Basic Angiographic Evaluation

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Description

Critical Limb Threatening Ischemia (CLTI) represents the terminal stage of peripheral arterial disease (PAD). Over a 5-year period, 5% to 10% of patients with either mild to moderate PAD (as manifested by symptoms of intermittent claudication) will progress to CLTI. This clinical deterioration has been associated with multiple factors, including the frantic worldwide epidemic of obesity and diabetes, as well as the aging population, and the failed attempts at controlling tobacco use; and its prevalence is expected to exponentially increase to a conservatively estimated 2.8 million patients by 2020. The contemporary management of patients with CLTI is complex due to the multifaceted nature inherent to the disease process and the multiple gaps in care that are typical of currently common practice workflows, whereby different specialists treat the patient in an isolated, uncoordinated (and therefore inefficient) fashion. Each expert takes care of “one aspect” of the patient, but everyone misses the big picture represented by the need of a simultaneous, transition less and efficient multidisciplinary approach.

Revascularization

The “Achilles heel” of the current approach to CLTI, is the reigning “disjointment” of the pieces that should conform the CLTI team. There are multiple reasons underlying this inefficient process, which vary geographically (albeit sharing some features among regions, including prevalent conflicts of interest among specialists, secondary to archaic payment models). Therefore the patient can have the first clinical contact by either the Primary Care Physician (or an Advanced Practice Provider) or any of the potential members of the team (which does not require a rigid structure: this can vary between places based on available expertise), including an Endocrinologist, an Infectious Disease specialist, a Wound Care Specialist, a Podiatrist, occasionally an Orthotics Specialist as well as a “Vascular Rehabilitation Specialist”, and last but not least, the Vascular Specialist (either a Vascular Surgeon with endovascular training and experience, an Interventional Cardiologist or an Interventional Radiologist, depending on locally available expertise).

Once the patient undergoes complete revascularization, followup by a member (s) of the team, should be continuous to ensure complete healing and post-healing surveillance. A high index of suspicion and an aggressive approach should be kept in

mind, with prompt referral for repeat revascularization (of paramount importance since these patients live on a very delicate balance where perfusion is barely able to keep the metabolic needs of “healed” tissue, but will become insufficient if there is another insult to the skin barrier) in order to minimize potential complications and increase the likelihood of permanent positive outcomes. Unfortunately, currently followed protocols in clinical practice are not designed to function in this manner. Generally the patient is only referred to the vascular specialist after months of failed wound therapy or repetitive visits to the podiatrist or surgeon for serial debridements without improvement (due to lack of appropriate arterial circulation). Another weakness of this approach has been the traditional referral to specialists who are not trained in the latest revascularization techniques, leading to frequent amputations without even undergoing a basic angiographic evaluation. In the best of scenarios, patients are properly and timely referred to a vascular specialist, undergo appropriate non-invasive and invasive testing, and finally receive adequate revascularization therapy. Among these (unfortunately the minority), only a very small fraction returns for follow up with the vascular specialist, or with any of the other members of the team. Many times they do follow up with a “wound clinic” which is not affiliated with the system where the vascular specialist performed the intervention, and therefore are not familiar with the latest techniques and advances. Thanks to this disjointment, there is no communication between the members of the team that addresses the status of the patient, and many times when the patient finally comes back, the situation is worse than it was at the first encounter. Overall, there is a widespread lack of knowledge and attachment to the old ways that needs to be overcome. Unfortunately, data driven clinical studies to evaluate strategies for surveillance, use and duration of anti-platelets, anticoagulants and other risk factor modifying agents, as well as the use of non-invasive testing, and indications for repeat revascularization in these patients do not exist.

Therapeutic Angiogenesis

The pathophysiology of CLTI is complex and involves both micro and macro vascular pathological features. Therefore it is not surprising that therapeutic modalities are multifold, spanning many health care specialties and requiring substantial institutional infrastructure to provide optimal patient care.

Though challenging, the future of CLTI treatment is exciting with increasing focus on optimal wound care and prevention, adherence to proven medical therapies, improving revascularization outcomes with novel endovascular and surgical techniques and devices, and on-going investigation into promising therapies like therapeutic angiogenesis. Of paramount importance is the creation and establishment of the CLTI team, with aggressive referral upon identification of skin breakdowns or any other factors that can predispose the patient to a rapid decline and compromised prognosis. Patients with CLTI often

have chronic wounds, and newer cell-based therapies for chronic wounds show interesting parallels to stem cell therapy for CLTI. Several human-derived wound care products and therapies, including human neonatal fibroblast-derived dermis, bi-layered bioengineered skin substitute, recombinant human platelet-derived growth factor, and autologous platelet-rich plasma may provide insight into the mechanisms through which differentiated cells could be used as therapy for chronic wounds, and, in a similar fashion by which stem cells might have a therapeutic role in the management of patients with CLTI.