



## Do's and Don'ts for Ischaemic Toes in Diabetic Patients

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### Abstract

Ischaemic toes in Diabetic patients result from deficient blood supply, often enhanced by hypoesthesia which leads to unaware pressure damage. Vascular augmentation at this stage is not only too late, but might lead to embolic phenomenon, hence more ischaemic involvements. Radical amputation is contraindicated because gradual improvement could be expected as long as infection is kept away.

**Keywords:** Diabetes; Gangrene; Treatment

### Introduction

Ischaemic toes of different clinical presentations are common among the chronic diabetic patients. The presentation could be subclinical, when no specific symptoms are obvious or on the contrary, a rapidly progressive gangrene alarming for both the patient and the attending clinician could appear. The purpose of this communication is to discuss with both patients and clinicians about this common pathological entity and the correct reactions to be taken.

### Different presentations of Ischaemic Toes

The triad pathology among diabetics, viz. hyperglycemia, ischaemic and peripheral neuropathy are well-known. It is easy to assume that deficient blood supply is the only cause of toe ischemia. In reality, other components of the triad contribute. At the very early stage, the chronic patient starts to feel tingling and coldness in the toes as a result of peripheral nerve sensitiveness and ischaemia. Minor consistent pressure gives bruising, blisters, abrasion, then tip gangrene. The hyperglycemic state initiates surface infection, spreading quickly to the whole toe which turns gangrenous in no time.

Hence at the very beginning of the feeling of coldness, patients need to do the following: have a thorough check on the triad pathology; keep body warm so as to facilitate good general circulation; protect the affected foot and toes against pressure; check the opposite leg for similar problem; consider prophylactic antibiotics and blood thinning agents. An optimistic outlook could be maintained because at its early stage, even a tip gangrene could revert to normal [1,2].

### Usual fallacies

The assumption that any ulceration or gangrene is caused by vascular occlusion which is not reversible hinders the fulfillment of timely interventions as discussed in the last paragraph. The pessimistic assumption on the other hand might also invite unnecessary or untimely drastic measures like vascular surgery on toe amputation.

Vascular surgery could be unsuitable and certainly so when there are already full gangrenous presentations. Instead of improving the peripheral circulation, the surgical procedure of vascular augmentation often produces emboli washed distally to produce more vascular obstructions. Toe amputation could be favorably delayed for a clear demarcation of the gangrene unless local infection is threatening. Agents that provide vasorelaxation and haemodilution could be helpful at this critical early stage of frank ischaemia and early tip gangrene [3].

### Other positive measures

When ischemia affects the toe which is an end organ, revival happens only at the very early stage when only the skin and subcutaneous tissues are affected. When gangrene of segments of or the whole toe is affected, particularly when infection is obvious, removal needs no hesitation. Removal of one or more toes would not give special stump healing problems. Weight bearing and walking could be relatively satisfactory. Removal needs to involve all necrotic and ischaemic tissues, leaving non-viable tissues behind should be avoided. When closure of skin flaps is obviously unfavorable, sacrifice a bit more length, or leave as "open treatment" [3].

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cited.

During the whole treatment period, the unaffected parts (heel and other sites of foot) and the opposite leg must be protected against pressure and properly assessed. Assessment should include proper clinical examinations, control of blood-sugar level, sensory checking's, proper vascular investigations and the care of shoe-wares.

### Are there other means to help?

For diabetic ulcers, many alternative, supplementary treatment maneuvers have been described. Vasodilation medications might work for short periods. Hyperbaric oxygen therapy had been tried but did not work [4]. Growth factors have been used both topically and via intramuscular injection into nearby muscles. In the former case, topical applications did not stay [5,6]. In the latter, research with or without stem cells are going on [7].

Oral Agents like herbal medicine that might stimulate granulation formation in chronic ulcers have been reported and deserve further investigations [8].

### Conclusion

When an ischaemic toe turns gangrenous, diabetic experts correctly identify the vascular deficiency. Had it been discovered earlier, augmentation on the major peripheral arteries could have a lot to offer. For toes that are already diagnosed as dry or wet gangrene, the vascular surgeon tends to be over-optimistic, offering vascular stenting which might be too late as a rescue, but instead produce embolic phenomena. The orthopaedic surgeon, on the other hand, might tend to be over-pessimistic to assume that limited amputation might not guarantee stump healing, hence advocating below or even above knee amputation. For the majority of diabetic patients suffering from ischaemic legs, their advanced age would not allow the fitting of prosthesis, hence, even a non-functional, partially amputated foot, would be appreciated as a useful weight bearing lower leg [9-12].

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