



## Diabetic Complications in the Prediabetic Patient

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### Abstract

There are approximately 21 million diabetics in the United States. Research has shown a significant association between hyperglycemia and the progression of vascular disease and its complications. These vascular complications include myocardial infarctions, strokes, renal failure, amputations and blindness, especially if the hyperglycemia is not well controlled. Uncontrolled diabetes also causes numerous foot, skin and nerve complications (Charcot Joint, hammer toes, dry skin, and neuropathy) which combined with the vascular disease and decreased ability to fight infection lead to limb threatening ulcers.

To be labeled diabetic, one of the following criteria has to be fulfilled. The patient has to have a fasting blood sugar (FBS) of 126mg/dl or a blood sugar of 200mg/dl or greater after a two hour glucose tolerance test (GTT). A patient is labeled prediabetic with a FBS of 100-125mg/dl or a two hour GTT of 140-199mg/dl. Once a patient is labeled diabetic, every effort is made to keep the patients blood sugar controlled to prevent the complications of diabetes. This is not always the case with the prediabetic.

The following case illustrates a patient with severe bilateral diabetic foot ulcers, osteomyelitis, advanced neuropathy and distal vascular disease. The patient's prior history was negative for diabetes, but was consistent with prediabetes.

### History and Physical Exam

This is a 68 year old white female who noted a callous over the plantar aspect of her left

1st metatarsal, which quickly developed into an ulcer. She was initially treated with oral antibiotics by her private medical doctor due to increasing redness and swelling. She denied any pain, fever or chills. During that period she also began to develop an ulcer over the right 3rd and 4th metatarsal heads and she was referred to our clinic. She noted sensory neuropathy of both feet and lower legs, but denied having diabetes. Her history was complicated by suffering a recent fracture of her left foot which was treated conservatively.

Past Medical History was positive for hypertension and elevated triglycerides.

Family history was strongly positive for diabetes.

She smoked ¼ packs per day for 8 years, but quit many years ago.

Review of systems was negative for claudication, but was positive for occasional rest pain.

Physical Exam revealed palpable pulses through out and a stocking like neuropathy involving both feet and lower legs. Her ulcers are noted below.

### Before Treatment



### Before Treatment



### Before Treatment



Our initial impression was that the patient had infected ulcers of both feet with possible osteomyelitis and diabetes.

## Before Treatment



### Work Up

Her work up included serial blood sugars, wound culture which was positive for staphylococcus aureus, x-ray of the right foot showed no boney destruction and Transcutaneous Oximetry which revealed reversible local tissue hypoxia.

## Debridement



Prior arteriogram was significant for a 50% stenosis of the right common iliac artery, occlusion of the right superficial femoral artery with only peroneal runoff. The left side showed a 95% stenosis of the left SFA with only peroneal runoff. Carotid studies revealed bilateral carotid stenosis.

Follow up MRA on the right revealed a high grade stenosis of the common iliac, an occluded superficial femoral artery and severe

## During Treatment



trifurcation disease. The left side was similar to the pervious arteriogram.

### Patients Course

During the course of the patient's work up, the medial aspect of the infected 1st meta-

## During Treatment



tarsal joint also became necrotic.

Attempts were made to improve the patient's blood sugars and offload the ulcer. An infectious disease consult was obtained and the patient's antibiotics were adjusted. She also had a surgical consult for immediate debridement and possible vascular repair.

During this period the patient underwent the above MRA, but her treatment was inter-

rupted for a short period due to a GI bleed from her AV malformations and congestive heart failure. It was felt that the patient was too high of a risk for any major vascular

## During Treatment



## During Treatment



reconstruction. She underwent multiple debridements under local anesthesia and hyperbaric oxygen therapy was started, because the wound continued to deteriorate.

## Surgical Repair



## HBOT Treatment



A stent was successfully placed in the right common iliac a short time later. The patient had excessive drainage from her open infected joint, which was controlled with Iodosorb. Follow up cultures revealed MRSA and the antibiotics were adjusted.

Treatments were disrupted again due to syncope with angina and another GI bleed.

## During Treatment



## During Treatment



The patient was admitted and underwent another work up including a coronary angiogram. She was medically cleared and was referred back to continue her treatment. The patient had a total of 40 hyperbaric treat-

## During Treatment



## After Treatment



ments, transcutaneous oximetry improved, but more importantly the ulcer continued to close. Due to the loss of the medial collateral ligaments from multiple surgical debridements, a Hallus Valgus deformity developed. An orthopedic consulted was obtained and a repair of the deformity was recommended after the ulcer closed.

## About Precision Health Care

Precision Health Care is a comprehensive wound healing and hyperbaric medicine service organization dedicated to the development of state-of-the-art hyperbaric and wound healing centers through partnership and collaboration with our affiliate hospitals.

Community-based and patient-focused, we are driven by this mission philosophy: To provide select hospitals safe, comprehensive, compassionate wound healing and hyperbaric services for patients in need.

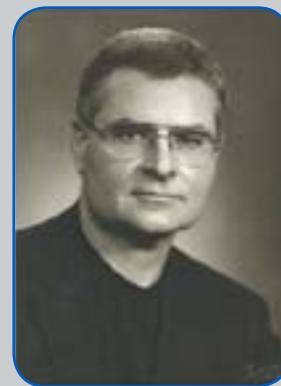
## Questions or Comments?

### Contact us:

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## About the Author



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