Toe Pressures: Superior to duplex parameters for healing?

Patrick A. Stone MD FACS
Professor of Surgery
Vanderbilt University

Disclosures

• None

Will it Heal?

What Tools as a Vascular Specialist

• Physical Examination
• Ankle brachial index
  - Digital pressures
• Plethysmography
• Duplex
  - Velocities
  - Waveforms
• Contrast based imaging—unlikely
• Doesn’t provide hemodynamic information.

Can we heal the toe amputation?

Prospective Data

Journal of Diabetes and Its Complications

The odds ratio was also calculated for each parameter measured. The odds ratio for every 1-mmHg increase in absolute toe pressure is 1.026, indicating a 2.6% increase in the odds of healing for every 1-mmHg increase in absolute toe pressure.
The procedure for obtaining toe pressures and TBIs involved applying a cuff of approximately 1.5-cm width on the proximal aspect of the hallux or 2nd toe (when the hallux had been amputated) and the photopletysmography probe was applied to the pulp of the hallux. Patients were examined in the supine position. When a regular waveform was observed, the sphygmomanometer was pumped up slowly to inflate the digital cuff and occlude digital blood flow. Upon slow release, the point at which the waveform was observed, the toe systolic pressure was measured. Using PPG, the actual TBI was obtained during gradual deflation of the cuff at the moment the pulsatile signal reappeared. Toe pressures and the TBI were automatically calculated by the Doppler unit and a print out was obtained.

Doppler waveform predicts major amputation in DIALYSIS patients

Our Experience: Pressure based Results

The predictive capacity of toe blood pressure and the toe brachial index for foot wound healing and amputation: A systematic review and meta-analysis

A systematic review and meta-analysis of tests to predict wound healing in diabetic foot

Transcutaneous Oximetry (TcP02)

Toe Pressures and Midfoot Amputations

Midfoot Amputations Expand Limb Salvage Rates for Diabetic Post Infections

Transtarsal Amputation salvaged failed TMA over 50% of the time.
What does any of this mean?

- Patient counseling: To give them some prognostic information to help guide on amputation level.

  - Some patients have to see a failed amputation and can't comprehend how a bad toe equals a BKA.
  - Helps guide revascularization strategies and supplement information on how well perfusion has been improved.
  - Really not any real changes for over 3 decades.

- Toe pressure:
  - > 50 mm Hg – Likely heal
  - 30-50 mm Hg – Coin toss
  - < 30 mm Hg – Won't heal