Is the Foot Elevation the Optimal Position for Wound Healing of a Diabetic Foot?

Reference:

Scientific Literature Review

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Podiatric Relevance:
This study looks at the transcutaneous oxygen levels of diabetic patients with foot ulcerations when the extremity is elevated and dependent. Elevation is often a part of the treatment course in the healing of these ulcerations, and this article questions the validity of that practice.

Methods:
This is a prospective study of 122 cases (73 males and 47 females: two males had bilateral disease) of diabetic foot ulcerations admitted to the Department of Plastic Surgery of Korea University Guro Hospital between September 2006 and June 2007. Transcutaneous oxygen (TcpO2) levels were measured in 21 cases at resting and then 24 hours after elevation of the extremity on four pillows (24cm height). The TcpO2 levels were then measured in 122 cases at a resting level and then 24 hours after dependency at patient’s tibial height. The research team ceased taking measurements of the elevated extremities as the first 21 patients had a decrease in TcpO2. Foot elevation was not seen as a benefit, this is why the n is different for each group of the study.

Results:
The average TcpO2 before elevation was 32.5±22.2 mmHg and decreased to 23.8±23.1 mmHg after elevation. There was a 26.8% overall decrease which was reported as statistically significant. The average baseline TcpO2 for the dependent group was 44.6 ± 23.8 mmHg and increased to 58.0 ± 25.9 mmHg after lowering. This increase was reported at 30.1% which was also statistically significant. The dependent group was then divided into four sub-groups by baseline TcpO2 (>20mmHg, 20-29 mmHg, 30-39 mmHg, 40-49 mmHg, <50mmHg). They found a greater increase in TcpO2 levels in patients with lower baselines. Patients with levels of >20mmHg had an increase of 137% (from 9.15 ± 5.36 to 21.7 ± 13.4) and patients with levels of 20-29mmHg had an increase of 61.4% (from 26.8± 2.02 to 43.2 ± 12.1 mmHg).

Conclusions:
This study demonstrates that elevation of the extremity decreases the transcutaneous oxygen levels in the peri–wound area of diabetic foot ulcerations. It also demonstrates an increase in transcutaneous oxygen levels to the peri-wound area of diabetic foot ulceration in dependency. Constant elevation of the extremity affected by diabetic foot ulceration may have a decreased healing potential simply due to the decreased tissue oxygenation.