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3-D scanning evaluation and Visitrak evaluation of Ulcer Area.

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Background and Aim: Visitrak calculation of ulcer area by tracing the outer edge of the wound with a fine ink marker on a double sheet transparent film is widely used to evaluate ulcer area. We introduce a 3-D optical scan system for calculation of ulcer area. The aim of this study was to compare the Visitrak calculation of ulcer area with a new 3-D optical scan of the ulcer. Material and Methods: In five below knee amputated legs, three ulcer lesions were applied. The area of the ulcer was calculated with the standard Visitrak method, by two persons (Visitrak1 and 2 area). The transparent acetate sheet was retraced on a digital tablet, which then calculated the area of the ulcer. The 3-D optical measuring device included a special light source, with stripe projection onto the object surface, two 3-D cameras and one digital camera connected, so that the exact geometry of the surface was reconstructed by capturing and combining these stripe patterns. Capture time was 0.25 second, 3-D resolution was 640x480 pixel. Results & Discussion: Using the Visitrak method for measuring the area of the ulcer, the area is underestimated mean 23.1 % (13.0 - 32.8 %). The reason for this is, that the Visitrak method measures the circumference of the ulcer, calculating the area of the circumference, taking no account for the depth of the ulcer. The 3-D scan measures the true area of the ulcer, including the ulcer bed. The 3-D method is fast, there are no problems related to curved surfaces and the ulcer circumference is easily defined. The method may estimate healing rate very precisely and may be a new tool for detecting small differences in healing rates, because of the high precision of the method.