

Visitrak: Wound measurement as an aid to making treatment decisions

Joanne McCardle, Maureen Smith, Emma Brewin, Matthew Young

Introduction

It is clearly established that the care of the diabetic foot is most effective in a multidisciplinary setting (International Working Group on the Diabetic Foot, 1999; Scottish Intercollegiate Guidelines Network, 2001; National Institute for Clinical Excellence, 2004; Edmonds and Foster, 2005). In the case of acute and active foot disease, a patient would be treated optimally as an inpatient. We believe this is often not possible as the increasing prevalence of foot problems would flood the already struggling hospitals. Therefore, the total care of a foot ulcer is usually carried out jointly between secondary and community teams. Multi-agency care can be effective, but it can also impair continuity of treatment plans. Although many trusts already have paper forms that can be passed from clinician to clinician mapping out the wound assessment and healing progress, as yet there is no method of monitoring wound measurement that can be used in a practical sense by all health professionals. In these case reports, we will be looking at the use of the Visitrak wound measurement system (Smith & Nephew Healthcare Ltd., Hull), and deciding whether it is an effective clinical tool that can be used when deciding which treatment interventions to make.

Wound measurement, as a basis for making treatment decisions, is a relatively new concept. Previous studies have identified that wound measurement, in combination with a consideration of other risk factors, can be a predictor of healing rates and ulcer outcomes (Oyibo et al, 2001; Margolis et al, 2002; Zimny et al, 2002; Sheehan et al, 2003). A significant reduction in percentage area within 4 weeks is a good indicator for response to treatment and eventual outcome (Flanagan, 2003). However, in this report we are not trying to identify whether wound measurement will predict eventual outcome. Instead, our purpose is to establish if wound measurement can be used as a parameter for identifying those wounds that are, or are not, responding to current therapies.

Evidence for wound measurement

There are a number of methods that can be employed in measuring wound size; the simple ruler method, acetate tracing plus manual square counting, and photography with computerised planimetry (digital

area measurement) are all examples. The efficacies of these methods have been compared in previous trials (Richard et al, 2000; Thawer et al, 2002). In our opinion, Visitrak is advantageous because not only is it simple and non-invasive, but it is also cost-effective and gives rapid results. It can be argued that simple ruler measurements or manual square counting are also cheap and easy to use; however, these can be time consuming and, in our opinion, inaccurate. Similarly, photography with computerised planimetry not only takes time, but clinicians require specialised training.

What is Visitrak?

Visitrak (Smith & Nephew Healthcare Ltd., Hull; *Figure 1*) is a portable wound measurement system that enables the measurement of all wound dimensions utilising planimetry. It is used as follows.

- The ulcer/wound outline is traced through a transparent three-layer sterile grid. The clean top layer can be stored in case notes.
- The grid is then attached to a portable digital tablet and, using a special stylus,

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1 Wound measurement, as a basis for making treatment decisions, is a relatively new concept.

2 An accurate and reproducible measurement of size should allow a rapid change of intervention if required.

3 There are a number of methods that can be employed in measuring wound size. Visitrak is a portable system utilising digital planimetry.

4 As well as aiding wound management, Visitrak tracings can be very useful as a patient education tool, potentially leading to increased concordance.

KEY WORDS

- Wound measurement
- Digital planimetry
- Treatment decisions
- Education
- Concordance

Joanne McCardle, Maureen Smith and Emma Brewin are Diabetes Specialist Podiatrists and Matthew Young is Consultant Physician at the Diabetic Foot Clinic, Royal Edinburgh Infirmary, Edinburgh.

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1 With different clinicians reviewing the wound on different days, changes in size may be difficult to detect.

2 The same can be said when wound care is undertaken by the same clinician: changes in size are not always visible to the naked eye.

3 An accurate and reproducible measurement of size should allow a rapid change of intervention if required.

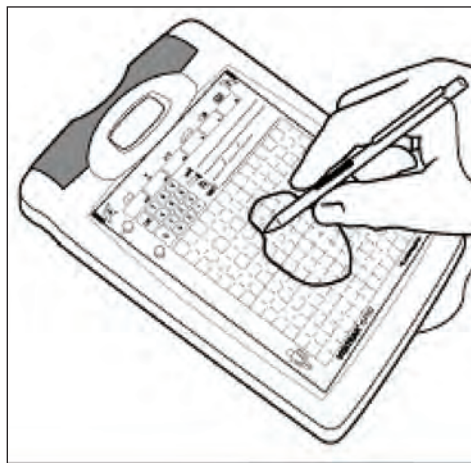


Figure 1. Diagram of the Visitrak wound measurement system. The tracing of the wound outline is transferred to a digital tablet to calculate the area of the wound.

when wound care is undertaken by the same clinician: changes in size are not always visible to the naked eye.

An accurate and reproducible measurement of size should allow a rapid change of intervention if required. Although the digital tablet is priced at £390 and the grids cost £35 per 50 units, in our opinion, the mounting cost of treating a chronic wound far surpasses this.

Is there evidence to support the accuracy of the Visitrak?

An internal study by the manufacturers evaluated whether the tracings were accurate, even when done quickly (Oien et al, 2002). The results were that area accuracy was equal to or exceeded 98.3% in all tests, with 98.7% accuracy achieved in the shortest test time. This is possibly due to the fact that slower tracings are more likely to cause hand tremor.

Another study (Thawer et al, 2002) concluded that manual and computerised techniques for wound area measurement were both inter- and intratester reliable, however, computerised was more precise, especially in larger wounds.

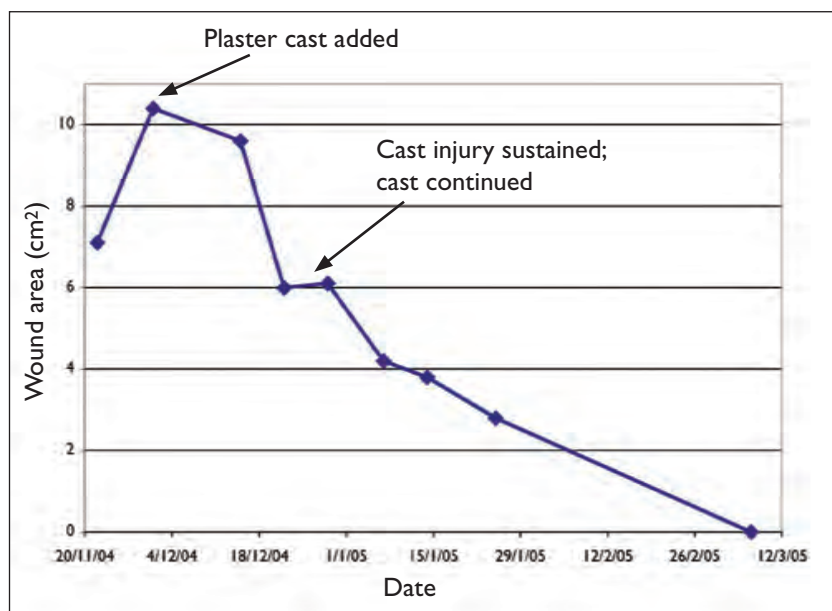
The case studies that follow will attempt to demonstrate the use of the Visitrak wound measurement system in the specialised diabetic foot clinic in Edinburgh Royal Infirmary. We will show that, in our opinion, it is an invaluable tool that helps inform some of our clinical decisions for intervention.

the tracing is converted onto the tablet to calculate the true area of a wound.

Percentage change in wound area can be calculated from previous measurements. The transparent tracing sheet can conform easily, making it ideal for measuring awkward areas on the foot, and all types of wounds and their sizes can be measured (>1.2cm²).

Visitrak was originally targeted at non-specialised clinicians, in particular district nurses, who are often scheduled to visit different patients on a rotating basis. With different clinicians reviewing the wound on different days, changes in size may be difficult to detect. The same can be said

Figure 2. The area of Mr G's wound varied over time and with different treatment regimens, as measured using Visitrak.



Case study I

History

Mr G is 57 years old with type 2 diabetes of an unknown duration. His control was sub-optimal, with marked retinopathy, hyperlipidaemia, hypertension, and significant peripheral neuropathy. On presentation, his right foot was a quiescent Charcot foot. The left foot had a mid-foot amputation as a consequence of previous ulceration. Although the amputation wound site on the left foot had reached closure, for 4 years Mr G had also had a plantar ulcer 10mm in diameter.

Initially, Mr G was referred to us for assessment with the intention that we would refer him for an elective below-knee

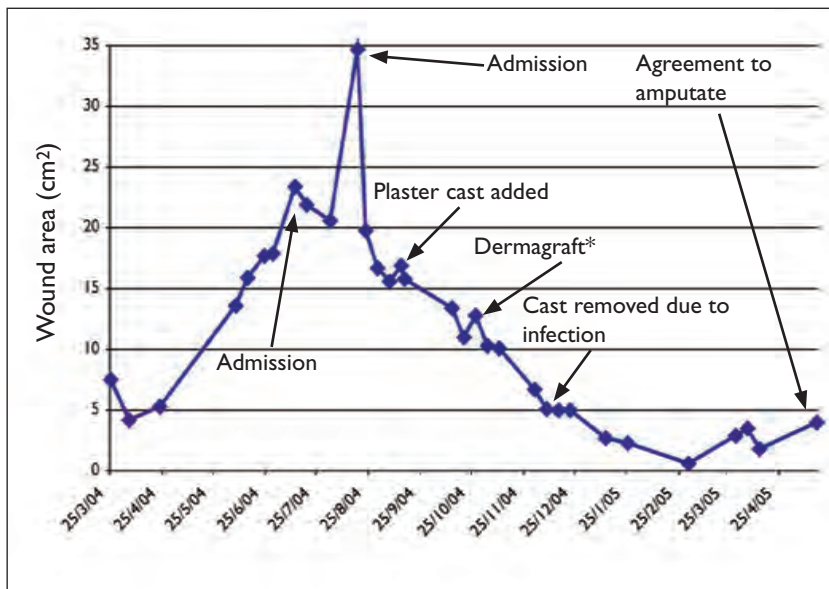


Figure 3. Mr K's treatment regimen and wound size as measured using Visitrak. (*Dermagraft, Smith & Nephew Healthcare Ltd., Hull.)

amputation, following advice. However, the team decided with the patient that we would attempt to heal the wound before taking the surgical route. We were aware that this was a challenging decision, but were confident that, with the correct treatment plans, we could succeed. Part of the clinical sessions included regular wound measurements with the Visitrak grids, in order to monitor progress, and assess if our regimens were working.

See Figure 2 for Mr G's treatment regimen and Visitrak wound measurements.

Discussion

Mr G had undergone treatment for 4 years in a previous clinic for his wound. Given the lack of success, the patient was extremely pessimistic. Early on in his treatment at our clinic, there was a large increase in wound size. We initially suggested that Mr G was placed into a plaster cast, but he refused. Once it was clear the ulcer was failing to improve, he relented. Once in cast the

ulcer started to close (Figure 2).

The ability to physically show him improvements and regression in its size using the Visitrak grids gave him incentive to adhere to our recommendations. We therefore were able to confidently continue with the plaster cast despite two minor cast abrasions (Figure 2; December 2004) that might otherwise have halted treatment. The Visitrak tracings proved to be an excellent education tool as well as aiding management in this case.

Case study 2

History

Mr K is 49 years old with type I diabetes. His metabolic control was erratic and he was often dismissive of the seriousness of his diabetes. Mr K had dense neuropathy, and had a history of ulceration bilaterally. Prior to the use of the Visitrak system, there was a static ulceration on the right calcaneal plantar area with no real signs of improvement, despite a number of different interventions.

Mr K's treatment regimen and Visitrak measurements are outlined in Figure 3. Figures 4 and 5 show the calcaneal ulcer at different stages.

Discussion

Mr K was not unlike Mr G in that adherence with care advice was a problem. There was an improvement in this when the ulcer was showing signs of healing. However, setbacks were common, as the patient was unwilling or unable to rest adequately. In addition, there were numerous serious infections, hospital admissions and changes in management. Each of these was detected through the Visitrak measurements (Figure 3).

Prior to Christmas 2004 infection flared up again. Mr K abraded his foot with a knitting needle and had to be taken out of cast. The ulcer started to deteriorate and the clinical team came to the conclusion that a below-knee amputation was in the best interest of the patient. Initially, he was reluctant to consider this option. However, as the ulcer started to enlarge through the spring of 2005, Mr K agreed. He underwent elective amputation in June 2005. Two months later he was free of infection and

Figure 4. Mr K's heel ulcer at its largest (summer 2004). There is a deep sinus and hypergranulation tissue associated with the underlying osteomyelitis. Mr K was put in to cast shortly after this picture was taken.





Figure 5. Mr K's ulcer at its smallest (spring 2005). There was still a deep sinus to the remains of the calcaneum and the infection worsened again shortly after this picture was taken, requiring a below-knee amputation.

walking unaided with a prosthesis.

Conclusion

Both case reports demonstrate that regular wound measurement is a useful aid to decide treatment interventions. The Visitrak system is not only easy to use, but it produces accurate results (Thawber et al, 2002). Although these reports have only demonstrated its use in a specialised foot care centre, we would advocate its use across the entire spectrum of professionals involved in the clinical care of ulceration. ■

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