Case study: Using the geko™ device to prevent oedema following ankle replacement surgery

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Subject

67-year-old male, non-smoker in good general health.

Procedure

Total left ankle replacement

Percutaneous achilles lengthening

Fixation of intra-operative lateral malleolar fracture

Relevant Clinical History

The patient had a history of polio and underwent a left triple ankle fusion previously, he returned to Edinburgh Royal Infirmary after experiencing pain over the left ankle joint.

Rationale for treating with the geko™ device

The aim of ankle replacement surgery is to relieve pain and improve ankle function and mobility. Patients are advised to expect some swelling for up to one year after surgery[1]. In this case the geko™ device was chosen as a treatment modality to help accelerate the reduction of the swelling immediately post-operation. Neuromuscular Electro-stimulation (NMES) is effective at increasing venous flow and reducing oedema in the lower limb[2]. The geko™ device has been shown to be effective at providing up to 60% of the blood flow achieved with maximal effort dorsiflexion movements in healthy individuals[3]. The small, lightweight and easy portability of the geko™ device means that it is ideal for providing treatment to patients continuously throughout the day whilst they are active and at rest.

The geko™ device was worn for 24 hours per day for the first 5 days' post-operation and for 12 hours per day for a further 2 days. It was worn for 8 hours on day 8. Discharge medication included paracetamol 1000mg q.d.s, Ibuprofen 400mg q.d.s and omeprazole 20mg q.d.

Day	geko™ use	Symptoms	Photos
Day 1- 5 Patient had a below the knee plaster cast	24 hours per day	Upon prompting the patient reported: • No pain Observations: • No swelling observed upon examination • No bruising observed upon examination	
Day 6-7 Patient had a below the knee plaster cast	12 hours per day	Upon prompting the patient reported: • No pain Observations: • No swelling observed upon examination • No bruising observed upon examination	
Day 8	8 hours a day	Upon prompting the patient reported: • No pain Observations: • No swelling observed upon examination	
Day 10 Follow up	No geko™ worn	Suture sites showed excellent healing Wounds are clean and dry	

Patient Feedback

This patient found the geko™ device simple to apply and easy to use. He did not experience any difficulty in sleeping whilst wearing the device. The patient was astonished to experience sensation in his toes, they felt warmer than they usually would, stating that they were normally always freezing. He also couldn't believe how well his wounds were healing in comparison to his previous surgical recovery which took up to 16 weeks to heal. He recalled having to visit his medical centre twice weekly for dressing changes and swabbing tests to check for possible infections.

> *"Having experienced back to back surgery, I can honestly say that wearing the geko™ device has made a huge difference this time around, I can see and feel the benefits already, especially seeing my wounds heal so fast after just 17 days. I have already started telling everyone I know about this clever little thing"*

Conclusion

This case study illustrates that the geko™ device may be a useful treatment modality to help reduce swelling in patients recovering from ankle surgery. This patient was impressed by the action of the device and thought that it was extremely beneficial for reducing swelling and decreasing the pain following his surgery.

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References

1.www.bofas.org.uk Royal National Orthopaedic Hospital Patient Information on Ankle Arthritis, p26. Accessed September 2014.

2. Case studies, data on file.

3. Tucker AT, Maass A, Bain DS, Chen L-H, Azzam M, Dawson H, Johnston A: Augmentation of venous, arterial and microvascular blood supply in the leg by isometric neuromuscular stimulation via the peroneal nerve. Int. J Angiol. 2010 Spring; 19(1): e31–e37. PMCID: PMC2949997

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