

Case study 4: Using the geko™ device to prevent oedema and promote functional activity following foot surgery

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Subject

65 year old female

Procedure

Cheilectomy

Relevant Clinical History

The patient, a recently retired Accident and Emergency nurse, who is an active walker and is generally fit and well. She takes Simvastatin and Cetirizine for allergies and does not report any other co morbidities.

Clinical Presentation

She reports with clinically and radiologically confirmed hallux rigidus of the right 1st Metatarsophalangeal (MTP) joint with a large dorsal osteophyte which is impinging, causing pain and restricting dorsiflexion of the great toe. Walking is painful and restricted by this. She does not have any rest or night pain.

There is evidence of joint space narrowing and subchondral sclerosis and osteophyte formation.

The patient will benefit from a 1st MTP joint debridement to provide her with more movement, pain relief and conservation of the joint.

Rationale for treating with the geko™ device

Hallux Rigidus is one of the most common causes of forefoot pain¹. The aim of surgery was to relieve pain, improve movement and achieve conservation of the joint. Surgery to correct Hallux Rigidus is a largely successful operation², with good or excellent results in 97% of patients².


However, patients are advised that the foot and ankle may be swollen for three months or longer post-surgery.³

The geko™ device was therefore chosen as a treatment modality to help accelerate the reduction of oedema and also to increase blood flow. This is because Neuromuscular Electro-stimulation (NMES) has been found to be effective at increasing venous flow and reducing oedema in the lower limb. The small size and 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 is effective at providing up to 70% of the blood flow achieved with maximal effort dorsiflexion movements⁴

The geko™ device

The geko™ device was worn for 3 consecutive days for 24 hours per day, followed by 6 hours a day for the next 7 days. The patient was followed up at day 10 post-operation.

Results

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| <p><u>PRE OP</u></p> <p><u>geko™ use pre-op</u> Patient did not use the geko™ device pre op</p> <p><u>geko™ use post-op</u> The geko™ device was applied to the patient in recovery 1-hour post op.</p> <p>No activity was taken during this time of using the device.</p> | <p><u>SYMPTOMS</u></p> <ul style="list-style-type: none"> • Inflammation • Pain 7/10 • Reduced dorsiflexion • Pain on walking • Numbness |
| <p><u>DAY 1 - DAY 10</u></p> <p><u>geko™ use</u> The geko™ device was worn for 24 hours for 3 days and for a further 7 days for 6 hours a day.</p>  <p>Photo at Day 10</p> | <p><u>SYMPTOMS DAY 10</u></p> <ul style="list-style-type: none"> • No pain - painkillers not required • Minimal bruising • Wound healed • No swelling L=R • Active range of movement of the 1st MTP joint • Passive range of movement of the 1st MTP joint • Patient weight bearing with heel wedge shoe • No crutches required • Dressing removed |

Patient Feedback

“I would certainly recommend the geko™ device. My own experience has been very positive as I feel it has certainly helped the operation on my big toe to heal quickly due to improved circulation in my lower leg, foot and ankle, therefore reducing the swelling, aiding wound healing and reducing pain and discomfort. The geko™ device improved my recovery rate because the swelling reduced which reduced my pain. I did not need to take any pain killers and I was able to move the toe with less discomfort. The device was very easy to apply and no problems were encountered, a very neat device.

Conclusions

The geko™ device offers patients a drug-free treatment option to simply increase blood circulation in the lower limb and prevent swelling following foot surgery. This is important because excess fluids impede oxygen delivery and wound healing. We have previously used the geko™ device to successfully aid recovery from surgery to correct Hallux Valgus. This is the first time we have used the device post-surgery for Hallux Rigidus. Early observational use of the geko™ device has shown great promise and its health benefits following foot surgery warrant further investigation in patients undergoing other foot and ankle procedures.

References

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3. Royal National Orthopaedic Hospital. A Patient's Guide to Arthritis of the Big Toe 2010
4. 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. PMID: PMC2949997

