Case study: Using the geko™ device to prevent venous thrombosis and oedema following Strayer release of the gastrocnemius.

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Subject
23-year-old male.

Procedure
Strayer release of the gastrocnemius.

Relevant Clinical History
Patient is normally fit and was athletic up to the age of 20 at which time he reduced his activity levels due to pain in both of his lower limbs. He complained of stiffness in his ankles, pain behind his calves bilaterally, flat feet and also the inability to play sports. He suffers from low vitamin D levels and has severe needle phobia.

Clinical Presentation
Main symptoms appear on left lower limb, patient complains of discomfort over his left calf attachment of the gastrocnemius behind the knee and also tight hamstrings. When the ankle is in dorsiflexion or a neutral position it is not possible to extend the knee completely, demonstrating tightness of the gastrocnemius, presenting a positive Silfverskiöld test. Gastrocnemius lengthening procedure using a Strayer’s technique is an effective surgical option albeit carrying a number of risks including:

- Infection
- Damage to sural nerve
- Numbness behind the leg
- Painful scar formation
- Chronic regional pain syndrome
- Clot formation and clot embolism are quite high²

Rationale for treating with the geko™ device
Chemical prophylaxis such as Clexane® home injections were contraindicated due to his severe needle phobia. He was advised of the risks of developing deep vein thrombosis (DVT) and was instructed to use the geko™ device as an alternative form of prophylaxis. The Strayer release procedure involves admission into hospital for one day followed by the placement of a plaster cast thereafter for up to 4 weeks.
NICE guidance (MTG19) supports the use of the geko™ device for people who have a high risk of venous thromboembolism (VTE) and for whom pharmacological or other mechanical methods of VTE prevention are impractical or contraindicated.

Neuromuscular Electro-stimulation (NMES) is effective at increasing venous flow and reducing oedema in the lower limb. 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. 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 used unilaterally only on the operated leg**

Following the surgical procedure, the leg was placed in a neutral position and a below the knee light weight cast was applied post operatively from day 1 for 4 weeks.

**Day 1-7**

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<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
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<td>24 hour geko™ usage prescribed</td>
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<tr>
<td>Cast, full weight bearing (FWB), crutches</td>
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The patient reported a reduction in pain levels after day 3 of using the device.

**Day 8 – Ultrasound Doppler Report**

“No evidence of DVT from the left common femoral vein to the popliteal vein. All segments of vein are compressible, show good flow and respiratory variation. No DVT in the visualised calf veins.”

**Day 8 – 14**

Plaster cast changed with wound review at 2 weeks

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<thead>
<tr>
<th>Day 8</th>
<th>Day 9</th>
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<th>Day 11</th>
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<tr>
<td>24 hour geko™ usage prescribed</td>
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**Night time use only**

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<th>Day 15</th>
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The patient continued to use the geko™ device during the night up to four weeks following treatment.
**Picture 1 - Day 7**
Shows operated leg

**Picture 2**
Shows geko™ device being used for DVT prophylaxis

**Picture 3**
Shows operated leg six weeks' post surgery.
Six-week review

“The plaster cast was removed 4 weeks’ post-surgery and the wound appeared to be fully healed. The patient’s treatment will now incorporate the use of an air-cast boot for two weeks and he will commence physiotherapy. Strenuous exercise will be avoided up to 12 weeks from the date of surgery and strengthening activity will commence thereafter. The usual time for recovery after Strayer release is 6 to 9 months.”

Results

The geko™ device was well tolerated during treatment, his leg was elevated for the first ten days and sleep was unaffected during its use. The patient found fitting and removing the geko™ device daily was easy.

Patient Feedback

‘All in all the geko™ device was really good, it definitely helped my recovery and the swelling was kept minimal. When I started walking around, I only used the geko™ device during the night. My needle phobia is quite severe. When I need blood tests or minor needle procedures, I have to undergo a general anesthetic. So the geko™ device is definitely recommended for people in my position’.

Conclusions

The geko™ device offers patients a drug-free DVT prophylaxis treatment option which simply increases blood circulation in the lower limb and also prevents/reduces post-operative swelling. The patient was pleased to have an alternative form of DVT prophylaxis due to the severity of his needle phobia. The geko™ device may provide an alternative choice of prophylaxis for other such sufferers. The patient found the geko™ device easy to apply and monitor throughout his treatment and we were pleased with the positive feedback.

References

1. NICE medical technologies guidance (MTG19). Published date: June 20 2014