

CASE STUDY:

Management of recurrent venous leg ulcer with electroceutical therapy* to improve pain, expedite healing and reduce risk of recurrence

Paulina Louison, Senior Sister Tissue Viability, Central North West London NHS Foundation Trust, Hillingdon Community Health

Background

Venous leg ulcers (VLU) are a huge financial burden posing a significant impact on quality of life. VLU is a long term condition with frequent risk of ulcer recurrence. Two case studies were undertaken to determine the effect of using electroceutical therapy* to reduce pain, expedite healing with high strength collagen to reduce risk of recurrence.

Electrical Stimulation has been demonstrated to be effective in wound healing (Kloth 1995, Kloth and McCullouch 1996, Tadej et al 2010, Taylor et al 2011). Application of micro-current electrical pulses interacts with normal biological processes which have become dormant in chronic wounds (Chapman-Jones et al 2010) and thereby "kick starting" the wound healing physiology process. High strength deposition of collagen using electroceutical therapy* has been previously demonstrated (Ovens 2014), but its impact on prevention of VLU recurrence needs to be explored.

Case Study 1

History

A 57 year male presented on 24th June 2014 to the Complex Wound Clinic (CWC) with a fourth episode of left medial VLU. The ulcer had recurred spontaneously 6 weeks previously. The original wound developed following hospital admission for a DVT when he also underwent varicose vein surgery of the left leg which healed in April 2013. The patient experienced further episodes in July 2013, November 2013, and May 2014. The wound had never remained healed for longer than three months despite wearing class 3 compression hosiery, and the patient stated that he felt "the wound had never properly healed during this time".

Pain score was 7/10 and he was taking Co-Codamol twice daily. He was unable to tolerate an increase since he stated it made him drowsy which affected his work.

Ankle Brachial Pressure Index (ABPI) Right leg 1.08 and Left leg 1.01 with bi-phasic sounds. Skin assessment demonstrated significant staining to gaiter, ankle flare and slight oedema (see photo 2) and therefore underlying aetiology was likely to be venous.

Wound dimensions: ~ 2 x dry scab wounds approx. 1 cms sq and 0.75 cms sq with an area of peri wound inflammation approx. 2 cms (see photo 1). The inflammation was very painful to touch and slightly warm. He had been prescribed several courses of antibiotics by the Practice Nurse but the pain had not improved. Exudate was minimal blood stained/amber.

Previous Medical History

DVT left leg
VV left leg
Left leg ulcer recurrence x 3
Umbilical hernia repair
B12 deficiency

Medication

Warfarin
Lansoprazole
Quinine sulphate
B12 injections
Co-Codamol

Social

Warehouse worker working shifts and standing for long periods wearing a work boot.

Allergies

Cranberries

Treatment

- Soak with Polyhexanide (PHMB) and Undecylenamidopropyl Betaine (Betaine) wound irrigation solution.
- Weekly dressings with Primary honey dressing.
- High compression bandage with a dynamic bandage system of inelastic and elastic components.

- Encouraged to take Paracetamol between the co-codamol.
- Anti-gravitation measures (AGM) and Calf Muscle Exercises (CME).
- Referred to vascular consultant in view of multiple recurrence.

Progress

Some mild improvement in pain reduction and inflammation was noted during the following 4 weeks. However on 29th July 2014 the patient reported that the wound had again become increasingly more painful and although the peri wound inflammation improved, the treatment was changed to a silver primary dressing due to the presence of sub clinical infection. This greatly improved the pain to a score of 2/10 within a week and healing within 2 weeks on 12th August 2014. The plan was for the patient to attend the wound clinic to continue with the high compression bandage for 6 weeks post healing in view of high risk of recurrence. However the wound recurred again on 9th September 2014.

The patient attended the vascular clinic on 17th Sept 2014 and a venous duplex scan was ordered. The wound had deteriorated and measured approx. 3 cms sq with peri wound maceration of approx. 1.5 cms (see photo 3), which was very tender to touch. Silver dressings were recommended and the team discussed use of electroceutical therapy* to expedite healing, with the aim to reduce the risk of recurrence. On 23rd September 2014 patient reported that the wound had been very painful with a score of approx. 7/10. The patient agreed to commence the electroceutical therapy* and continue the silver dressing for a further week with high compression bandage and take some sick leave from work during the therapy to enable rest and elevation. The patient would change the electroceutical therapy component every 48 hours and continue to attend the clinic weekly.

Following one week treatment the patient reported that the pain had significantly reduced, taking much less analgesia, and the wound had reduced in size to 1cms sq (see photo 4). On completion of the therapy on 8th October progress continued (see photo 5). The primary dressing was changed to light honey dressing with high compression bandage. He was able to rest and elevate his limb which was also likely to have contributed to reduction of pain.

Results

The wound healed completely on 23rd November 2014. He was seen by vascular team and the Duplex scan reported incompetence in Left LSV and old scarring from his previous DVT and the decision was taken for conservative management with high compression and to perform AGM and CME. The patient was discharged with class 3 British Standard hosiery. The patient reported that he felt the healed tissue was "different and stronger" and that it "felt properly healed".

The left leg wound has remained healed 5 months later and will be monitored every 6 months.

Photo 1
Left medial aspect 24th June 2014



Photo 2
Bilateral legs ant aspect 24th June 2014



Photo 3
Left medial aspect 17th September 2014



Photo 4
Left medial aspect 1st October 2014
1 week following electroceutical therapy*.



Photo 5
Left medial aspect 8th October 2014
2 week following electroceutical therapy*.



Case Study 2

History

A 65 year old male presented to the CWC on 3rd July 2014 following a 3rd recurrence of VLU to his left medial leg present for 4 months. The two previous recurrences had occurred within 5 months and 2 months of healing.

Pain score was 6/10 described as shooting pain around the wound radiating up the leg. He reported he was reluctant to take analgesia since he felt they were ineffective.

ABPI Right leg 1.3 and Left leg 1.4 with bi-phasic sounds. Skin assessment demonstrated significant staining and ankle flare (see photo 7) and therefore underlying aetiology was likely to be venous.

Wound dimensions: approximately 2.5 cms sq with cliff edge and 100% slough with an area of peri wound inflammation (see photo 6). The inflammation was warm to touch. Exudate was moderate and blood stained. He had nearly completed a course of Flucloxacillin but with no improvement noted by the patient.

Previous Medical History

Asthma
Hypothyroidism
Hypertension
Arthritis left ankle
Chronic kidney disease stage 3

Social

Retired engineer

Medication

Levothyroxine
Losartan

Allergies

Honey dressing
Foam adhesive dressing

Treatment

- Soak with Polyhexanide (PHMB) and Undecylenamidopropyl Betaine (Betaine) wound irrigation solution.
- Twice weekly dressings with primary Silver Alginate dressing for a "2 week challenge" period
- High compression with inelastic bandage
- Encouraged to take regular Paracetamol
- Anti - gravitation measures (AGM) and Calf Muscle Exercises (CME).
- Referred to vascular consultant in view of multiple recurrences.

Progress

The patient was seen twice weekly for dressing changes by the District Nurses in the wound clinic and regularly for review in the CWC. On 4th September 2014 the wound had slightly increased in size (see photo 8 and 9) with punched edges and his pain score was 10/10. A wound swab for taken for culture and sensitivity and a primary dressing changed to topical honey which was later deemed to cause an allergic reaction. The wound swab showed no pathogens. On 9th October there was a slight decrease in wound dimensions and pain and the patient expressed his mobility was slightly improved.

Due to slippage of the bandage with the inelastic bandage, the compression system was changed to a combination dynamic bandage system with inelastic and elastic components. Dressings were reduced to weekly.

On 23rd October tenderness pain continued and the wound appeared punched out with dimensions of 1.5 cms (see photo 10 and 11). Following discussion of the benefits of electroceutical therapy* previously, the treatment was commenced. Treatment continued with a non-adherent primary dressing and high compression bandage. The patient managed self-care for change of the electroceutical therapy component. The therapy was well tolerated and following completion on 5th November, although the size was unchanged, the slough was debrided and large areas of granulation were noted (see photo 12) and the pain level was considerably reduced to 1/10. He was seen by the vascular consultant who ordered a venous duplex scan which determined need for closure of the long saphenous vein and the patient was added to the waiting list.

Results

6 weeks following treatment with the electroceutical therapy*, the wound dimensions were 1 cms sq with light slough (see photo 13), well controlled oedema and no pain. The patient reported significant improvement in walking. The wound continued to improve (see photo 14) and healed on 12th February with the patient stating "the healed tissue feels much stronger and less delicate than anytime previously".

The patients wound has remained healed up until April 2015 and this will be monitored. The patient reported that he "can now have hot showers whereas previously the healed tissue could not tolerate this and had to endure luke warm showering"

Photo 6
Wound to left medial leg 3rd July 2014



Photo 7
Bilateral legs ant aspect 3rd July 2014



Photo 8
Left medial aspect 4th September 2014



Photo 9
Left medial aspect 4th September 2014



Photo 10
Left medial aspect 23rd October 2014
Commencing electroceutical therapy*.

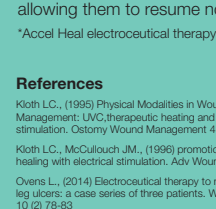
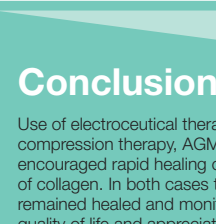
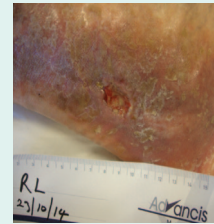


Photo 11
Left medial aspect 23rd October 2014
Commencing electroceutical therapy*.



Photo 12
Left medial aspect 5th November 2014
Completion of electroceutical therapy*.



Photo 13
Left medial aspect 4th December 2014



Photo 14
Left medial aspect 8th January 2015



Conclusion

Use of electroceutical therapy* in combination with standard dressings, compression therapy, AGM and CME, significantly reduced the pain, encouraged rapid healing of the ulcers with evidence of good deposition of collagen. In both cases the previous multiple recurrences of VLU have remained healed and monitoring will continue. Both patients had improved quality of life and appreciated the improved skin integrity of the healed ulcers allowing them to resume normal activities of living.

*Accel Heal electroceutical therapy

References

- Kloth LC., (1995) Physical Modalities in Wound Management: UVC,therapeutic heating and electrical stimulation. *Ostomy Wound Management* 41 18-27
- Kloth LC., McCullouch JM., (1996) promotion of wound healing with electrical stimulation. *Adv Wound Care* 9 42-45
- Ovens L., (2014) Electroceutical therapy to manage complex leg ulcers: a case series of three patients. *Wounds UK* 10 (2) 78-83
- Tradej M., Young SI., Hampton S., (2010) Accel-Heal: A new therapy for chronic wounds. *Journal of Community Nursing* 24 (5)16-20
- Taylor RR., Sladkevicius E., Guest JF., (2011) Modelling the cost effectiveness of electrical stimulation therapy in non-healing venous leg ulcers. *Journal of Wound Care* 20 (10) 464472