

# INTEGRATION OF AN ELECTROSTIMULATION DEVICE INTO THE MANAGEMENT OF PATIENTS WITH HARD TO HEAL LEG ULCERS

Clementine Toussaint<sup>1</sup>, Pascal Toussaint<sup>2</sup>, Vincent Hernandez<sup>2</sup>, Patrick Bandon<sup>2</sup>, Julia Barranger<sup>2</sup>

*1 Hôpital Saint André, Bordeaux, France,*

*2 Maison de Sante Protestante Bordeaux Bagatelle, Talence, France*



# BACKGROUND

- Autologous skin graft can be an efficient way of reducing healing time of healing leg ulcers<sup>1</sup>
- However, in our experience wound preparation for graft can be painful
- Use of EST has been shown to reduce pain and improve healing outcomes in hard to heal wounds
- We integrated an EST device to our existing leg ulcer treatment

# AIMS

- To analyse the benefit of a microcurrent EST device\* on the management of patients with leg ulcers, on an outpatient basis
- To evaluate the sequential use of EST\* and autologous skin graft to treat hard to heal painful leg ulcers



# METHODS

- Single-centre, observational study
- Inclusion: outpatients with painful leg ulcer that were not responding to standard care



- To reduce pain
- To improve quality of wound care during preparation of wound for graft

- Tailored to individual for wound conditions

- To be carried out when wound pain decreased and granulation tissue covers  $\geq 75\%$  of wound area

## • Outcomes

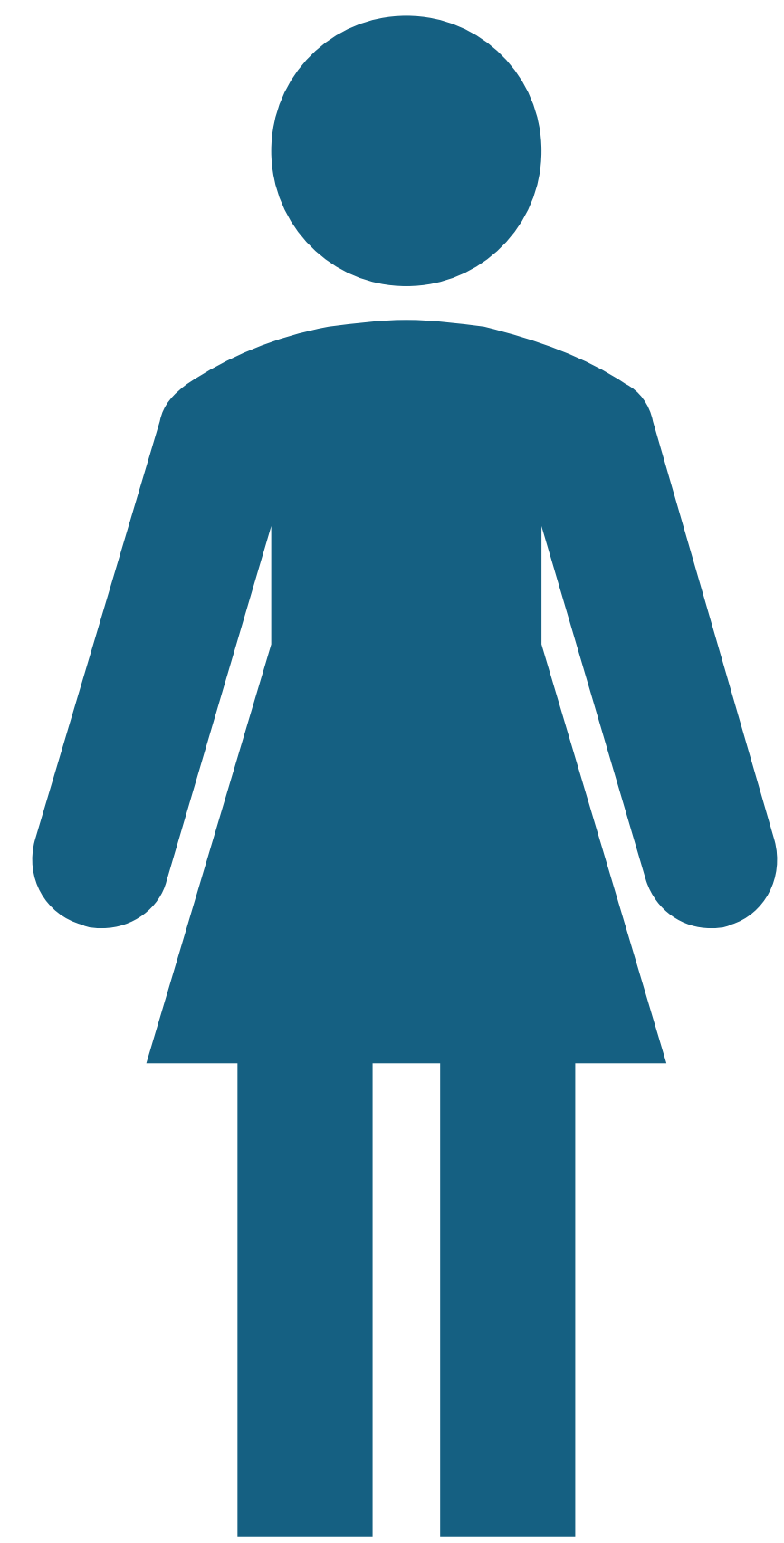
- Wound pain was measured using the 0-10 VAS on first day of therapy (baseline), day 7, final day of therapy (day 12) and after skin grafting
- Wound size was also monitored

\*Accel-Heal Solo, Accel-Heal Technologies Limited, Hever, Kent, UK.  
EST, electrical stimulation therapy; VAS, visual analogue scale.

1. Serra R, et al. Skin grafting for the treatment of chronic leg ulcers - a systematic review in evidence-based medicine. Int Wound J. 2017 Feb;14(1):149-157.

# PATIENT CHARACTERISTICS

N= 40



- % female: 55%
- Mean age: 74 years (range 45-90)
- Median wound duration: 12 months (range 2-42)
- Median wound area: 22.2cm<sup>2</sup> (range 2-60cm<sup>2</sup>)
- Wound type
  - 13 Mixed ulcer (w/o CLI)
  - 11 hypertensive ischaemic ulcer
  - 8 VLU
  - 4 hydroxyurea induced leg ulcer
  - 4 Post-traumatic leg ulcer

# PATIENT OUTCOMES

- ✓ 29/40 (72.5%) progressed to skin graft
  - Most common reason for skin graft refusal (n=11) was that pain reduction with EST was sufficient for patients' quality of life
- ✓ In the 29 patients who progressed to skin graft, mean wound area reduction of 74.3% was observed 1-month after skin graft

# WOUND PAIN DECREASED

- Mean wound pain at baseline was 7.2/10 (range 9-5)
- After 7 days of treatment with microcurrent EST\*, this had reduced to 4.1/10 → a 44% reduction in pain
- By the end of the 12-day EST treatment, wound pain had reduced to 2.8, categorised as mild pain, on average a 61% reduction in pain
- Four days after skin graft (29 patients) → a 85% reduction in pain was observed

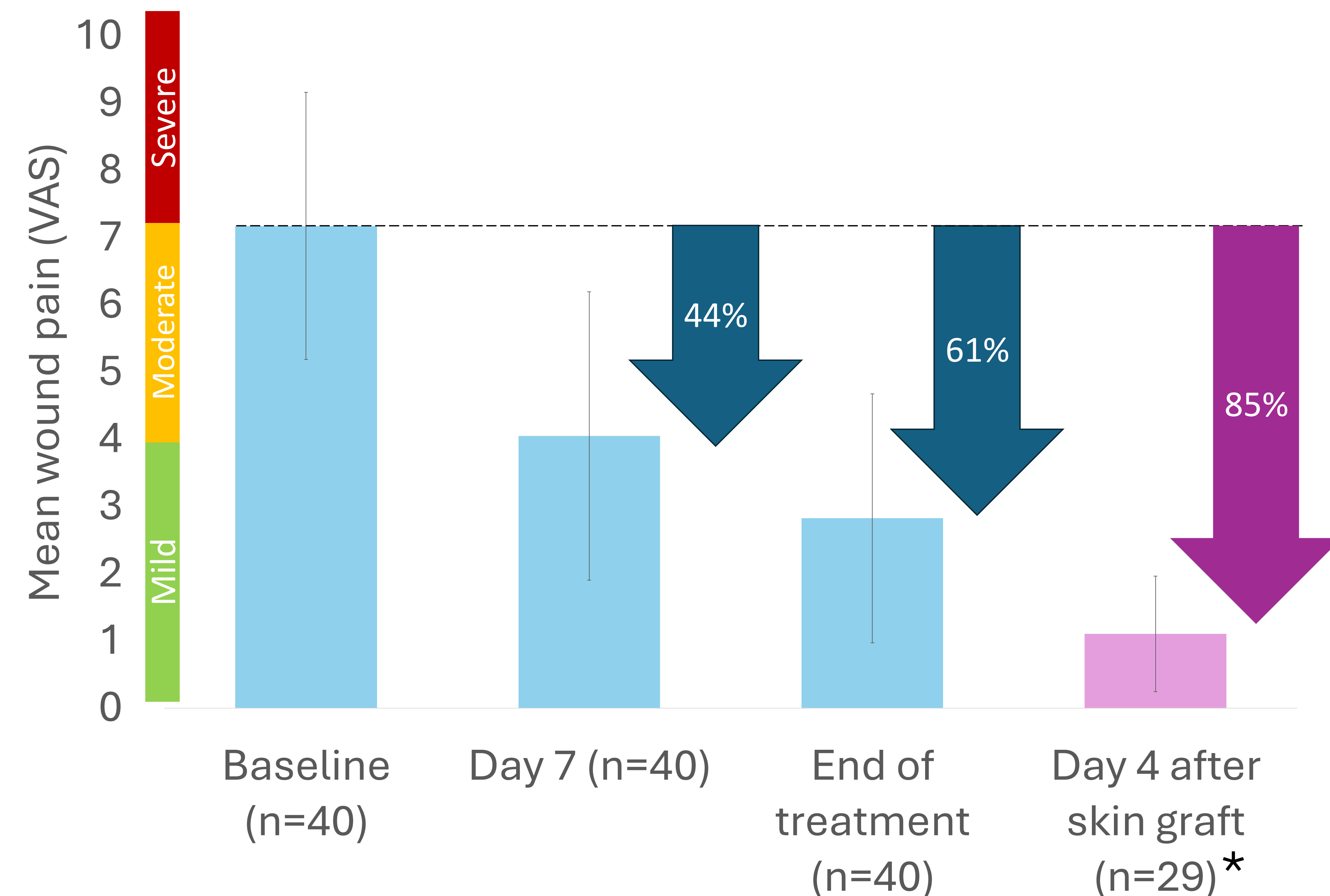


Chart shows mean wound pain measured in 0-10 VAS; error bars denote SD. Pain categories included severe pain (VAS 7 or higher), moderate pain (VAS 4-7), mild pain (VAS <4->0) and no pain (VAS 0). \*In the 29 patients who underwent a graft procedure, only.

CLI, critical limb ischaemia; EST, electrical stimulation therapy; SD, standard deviation; VAS, visual analogue scale.

\*Accel-Heal Solo, Accel-Heal Technologies Limited, Hever, Kent, UK.

## CASE 1: Patient with VLU of 42 months duration and severe wound pain



VAS 8



VAS 6



VAS 2



VAS 0

## CASE 2: Patient with hypertensive ischaemic leg ulcer of 2 months duration and severe wound pain



VAS 8



VAS 4



VAS 0



VAS 0

EST, electrical stimulation therapy; VAS, visual analogue scale.

\*Accel-Heal Solo, Accel-Heal Technologies Limited, Hever, Kent, UK.

## CASE 3: Patient with a severely painful hydroxurea-induced leg ulcer of 6 month duration



VAS 8



VAS 4



VAS 1

## CONCLUSIONS

✓ Benefits of sequential use of EST and autologous skin graft in the treatment of hard to heal, painful leg ulcers included:

- 60% reduction in pain during EST\*
- Partial improvement of wound condition allowing a skin graft to be performed

✓ The pain relief measured during treatment was observed to lead to more efficient care:

- Majority of patients were able to progress to skin graft as planned (72.5%)
- Although a sizable proportion chose not to undergo this procedure this was mostly because the pain relief experienced with EST\* meant they could now cope better with their ulcer and preferred to heal by secondary intention