Acupuncture as add-on treatment in the management of a patient with ecthyma gangrenosum

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ABSTRACT
Acupuncture is believed to have a positive effect on wound healing. A case is presented in which the healing of a leg ulcer which proved to be difficult to treat coincided with the added treatment modality of needling healthy tissue surrounding the lesion. It raises questions about the potential effect of local dry needling on tissue regeneration.

BACKGROUND
Acupuncture tradition suggests that circling a tissue lesion with acupuncture needles facilitates the healing process, a practice known as ‘circling the dragon’. Anecdotal case reports suggest a beneficial effect on leg ulcers.\(^1\) A situation occurred in primary care where acupuncture as add-on treatment to usual care coincided with an improvement of the wound healing process in a condition which proved to be difficult to treat.

CASE REPORT
Presenting complaint
The index condition in this case was a slow healing skin ulcer on the right anterior shin with surrounding soft tissue infection and reappearing satellite lesions in an asymptomatic young woman without previous skin conditions or current immunocompromise.

History
An 18-year-old woman presented to her general practice in March 2011 with a skin lesion on her right anterior shin. The first doctor noted ‘3 cm×3 cm indurated area with discharging boil, looks shallow, no fever – P 1/52 oral abx, advise on cleaning wounds, TCI if surrounding areas erythema/pain/systemic sx, otherwise review 1/52 to ensure healing as on shin bone’. She was treated with topical and systemic antibiotics (fusidic acid, flucloxacillin 250 mg four times a day) and magnesium sulfate paste. Follow-up visits 1 and 4 weeks later showed no change. During the same period the patient developed goitre and was investigated for suspected hyperthyroidism and referred into secondary care. The shin wound stayed the same. The practice nurse noticed the absence of wound healing in a healthy young patient and alerted the doctor for a second opinion. Further investigations regarding both the wound and her thyroid followed. The patient appeared well systemically and, with the exception of thyroid function tests, her blood tests (full blood count, white cell count, erythrocyte sedimentation rate, urea and electrolytes, C reactive protein, fasting glucose) were in the normal range. Wound swabs demonstrated colonisation with \textit{Staphylococcus aureus}. At the end of May the author...
was the doctor involved in treatment. At this time there was a large erythematous area with circular well-demarcated ulcers visible. The patient and her mother described the process of the wound formation as an initial blister which then burst and formed an ulcer.

**Examination**

On examination at the end of May, 8 weeks after the initial presentation, there was one circular lesion which was the size of a £2 coin about 2 mm deep with granulating tissue in the centre of the wound. Figure 1 shows the wound with scar formation in the proximal parts of the affected skin area indicating partial healing with persistent spreading of the infection.

**Diagnosis**

It was thought that this represented a very slow healing deep skin infection, ecthyma gangrenosum. The author was familiar with similar presentations in subtropical Brazil. This skin infection starts with a painless erythematous macule, followed by the formation of a bulla which subsequently breaks down into a non-suppurative skin ulcer with surrounding erythema and oedema. The mechanism is believed to be necrotising vasculitis. In the literature, ecthyma is described as skin infection with either *S. aureus* or *Pseudomonas aeruginosa* as the infective agent, mainly occurring in immunocompromised subjects or neonates. However, in this case neither intrinsic nor extrinsic risk factors were present and subacute hyperthyroidism is not known to be an immunocompromising factor. Repeated blood tests showed the absence of a systemic infection. Wound swabs showed colonisation of the wound surface with *S. aureus* which was sensitive to flucloxacillin and resistant to penicillin. The dermatology department in secondary care was consulted for a second opinion on the same day. As this did not represent a dermatological emergency, the author discussed the next steps in the management of an awkward protracted wound infection with a dermatologist to arrange either a referral or assisted management in primary care.

**Treatment**

In collaboration with the dermatology department, the wound treatment was switched to clindamycin 150 mg tablets four times a day in addition to continuous thorough wound hygiene as improved ‘usual care’.

Four weeks later there was not much change despite the optimised antibiotic regime. In view of the protracted process and the fact that acupuncture was unlikely to produce harm in this situation, the patient was given weekly acupuncture treatment from the beginning of July. Treatment was only local, using the paradigm of improving diminished microcirculation.

Small diameter needles (Asia med B 1615 0.16x15 mm) were inserted into healthy cutis and subcutis without signs of inflammation (redness, oedema) just outside the inflamed area as target tissues. Figure 2 shows ‘circling the dragon’. The stimulation dose was achieved mainly by duration of needling exposure and the number of needles. The needles were not manipulated after insertion and no de-qi sensation was elicited. In one session up to 25 needles were used, with a treatment duration of 25–45 min. On one occasion exposure time was significantly exceeded due to a practitioner error; because of the longer treatment duration the patient was treated in a side room, the phlebotomy room, and the therapist forgot to take the needles out in time. Apologies were taken gracefully. The patient reported a positive outcome regarding the wound healing process after this unintended overexposure.

**Outcome**

After 8 weeks of adjuvant acupuncture treatment without any additional changes, the wound closed. The skin was still slightly oedematous and glossy, but folds were increasing and there were no new blisters forming. Throughout the treatment oral antibiotic therapy and daily wound hygiene were continued. At the end of August, 20 weeks after onset of the condition, treatment was stopped. Figure 3 shows the appearance of the skin at this time.

**DISCUSSION**

This case illustrates the empirical use of local acupuncture treatment as continuous thorough wound hygiene as improved ‘usual care’.
add-on to unsatisfactory ‘usual care’. Chronic ulcers are notoriously difficult to treat.\(^4\) The timely coincidence of the improvement in wound healing with acupuncture treatment does not indicate a causal relationship. Case reports have a low rank in the hierarchy of evidence.

Acupuncture is believed to have an effect on peripheral tissue regeneration via the axon reflex. The stimulation of peripheral sensory nerve endings by needling triggers antidromic release of vasoactive peptides like calcitonin gene-related peptide.\(^5\)–\(^8\) Skin ulceration is the result of tissue necrosis caused by local anoxia, low pH and mediated by toxins released by bacteria. Enhancement of nutritive blood flow in the affected region is the aim of treatment. The trophic effects of topical acupuncture, resulting in improved oxygenation of tissues and normalisation of pH, are the assumed mechanism underpinning the observed improvement of wound healing.

Given the awkwardness of ulcer treatment and the simplicity of local needling with minimal tissue trauma and very basic requirements for training to deliver this topical treatment, it may be worthwhile to explore the role of adjuvant acupuncture in the treatment of chronic leg ulcers further in controlled case studies or even comparative treatment studies. A trial addressing exactly this question is underway and the results are awaited with great interest.\(^9\) Preliminary results are promising and have been presented at the 5th International Medical Acupuncture Congress in Barcelona.\(^10\)

**Figure 3** Appearance of wound 20 weeks after onset of skin infection.
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