whom 83% were aged 3 years or below, 65% were injured inside a *ger*, a traditional tent-like dwelling, 41% were scalded with electric pots (mainly by falling into the pots) and another 15% with electric kettles (mainly by pulling the kettles). Moreover, 62% of major burn injuries were inflicted by electric pots or kettles. In Mongolia, a majority of people live in a *ger* or simple detached house with no separate kitchen, where electric pots and kettles are commonly used on the floor or low table, allowing children an easy access to these heat sources [5].

These findings informed us that over half of burn injuries, especially severe ones, could be prevented if electric pots and kettles are made inaccessible to children. Given a limited space inside the traditional dwelling, we came to develop a box-like kitchen rack in which electric pots and kettles can be kept out of the reach of children. An idea is consistent to Makhubalo's, i.e., "childhood burns are mainly environmentally determined and therefore preventable" [1]. Note that the development of the kitchen rack is still underway and will require a rigorous evaluation of its effectiveness in burn prevention. We hope that more translational research such as Makhubalo's will be reported in the journal.

Conflict of interest

None.

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Letter to the Editor

Chronic burn wound treatment by Erbium: YAG fractional ablation: First described report and literature review

In the past, the largest concern of a severe, acute thermal injury was survival. With a current estimated survival rate of 96.8% of patients admitted to burn centers [1], burn survivors are now plagued with the lifelong consequences of burn scar morbidity. Treatments for hypertrophic scarring, specifically burn scar contracture, have been heavily explored in the literature; however, there is a paucity of studies exploring chronic wounds post thermal injury [2]. While treatments for these wounds range from debridement and wound care [3] to hyperbaric oxygen therapy [2], patients are often troubled with these wounds for indefinite amounts of time.

Fractional laser resurfacing (FLR) is a new technology that has proved efficacious in relieving hypertrophic burn scar tension. A safe [4] and relatively quick procedure, fractionated laser treatments are well-tolerated with minimal morbidity in addition to having minimal postoperative downtime. While there is evidence that FLR improves symptoms associated with hypertrophic burn scarring [5,6], there are no examples in the surgical literature of its effectiveness in promoting the closure of chronic wounds associated with hypertrophic burn scars. Herein, we describe the first known example of such a phenomenon.

A 53-year-old male with no past medical history presented in September 2017 to the burn clinic of our American Burn Association-verified burn center for evaluation of a chronic wound. He originally suffered a full-thickness flame burn to his left leg after gasoline ignited at the age of 6 years old. The patient had subsequently undergone multiple skin grafts to his left leg, which left him with significant hypertrophic scarring that formed a tight scar band in his left leg. This band, in turn, led to a chronic open wound in his popliteal fossa for over 18 years. In August 2016 he presented for evaluation in our burn clinic for a 2 cm nonhealing ulcer in his left popliteal fossa and underwent hypertrophic scar release and ulcer excision with 5 cm × 3 cm rotational flap coverage to his left popliteal fossa. The patient was sent home with daily xeroform dressings and a knee immobilizer for 2 weeks. The patient returned postoperatively with partial skin dehiscence and flap necrosis. He was left with a large, 5 cm chronic open wound in his popliteal fossa with plans for trial of nonoperative wound care management (Fig. 1A). The patient subsequently underwent several months of wound care including multiple rounds of sharp debridement as well as 20+ visits to a hyperbaric oxygen chamber between November and December of 2016.

The patient was next seen in September 2017 for evaluation for laser contracture release of the hypertrophic scar band in

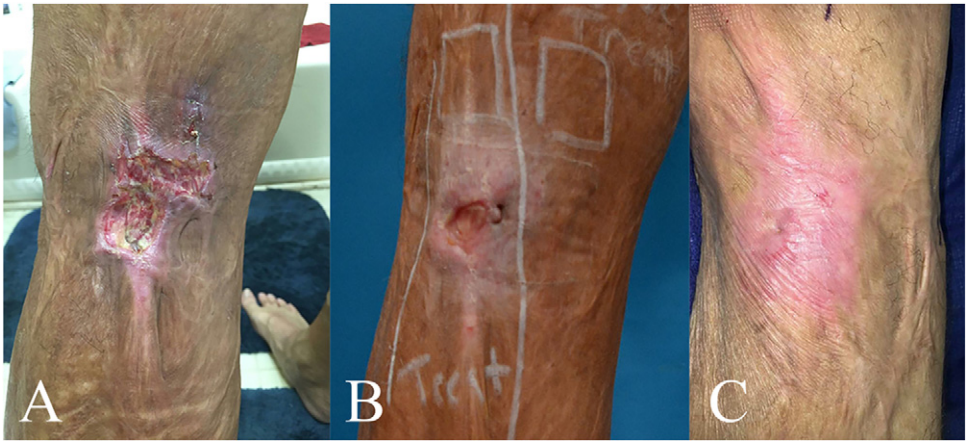

Fig. 1 – Interval wound history. (A) Chronic wound after death of flap. (B) Pre-Erbium:YAG treatment. (C) Post- three Erbium:YAG treatments.

his LLE popliteal fossa. The chronic wound remained, roughly 2.5 (Fig. 1B) cm in size. Between September and December 2017, the patient subsequently underwent three rounds of fractional ablation, separated by 4–5 weeks each, of the plate of hypertrophic scar on the posterior aspect of the left thigh, knee, and lower leg with the 2940 nm Erbium:YAG laser. Care was taken to ablate the scar immediately adjacent to the open wound but to leave the wound itself untreated. The scar was treated at a depth of 400 μm and a treatment area of 11%. After each treatment, the chronic would was found to subsequently smaller. In February, five months after the index laser therapy, the patient returned to clinic requesting a fourth fractional ablation treatment. At this time, the ulcer was noted to be completely closed (Fig. 1C). Follow-up two months later revealed continued closure of the prior, chronic wound.

Although not fully explored in the literature, it is not surprising that FLR leads to this wound healing phenomenon. The original purpose of FLR on thermal scars was to stimulate scar remodeling through initiating new collagen formation [7]. In fractional therapy specifically, laser deployment occurs in a pixelated fashion with microthermal treatment zones (MTZ) surrounded by areas of healthy skin [8], on the theory that the islands of remaining healthy tissue aid in the replenishment of the skin by restarting the standard wound healing process in a more organized fashion than that of the original injury. Not only did our patient experience significantly increased pliability in his hypertrophic band postoperatively, but the patient experienced healing of his chronic wound. There are two potential explanations for this phenomenon. First, these MTZs likely stimulated the healing of the chronic wound from "outside in" (i.e., healing, granulating tissue on the periphery of the wound allowed for new collagen formation to encroach into the wound interior over time). Second, and likely more important in our opinion, open wounds are perpetuated in burn scars by tension. Therefore, the relief of this tension line via laser treatment of the hypertrophic band would mechanistically suggest why this wound healed after laser treatments.

In a review of the literature, very little was found on the use of FLR as a method to treat nonhealing burn wounds. Initially, Shumaker et al. found, during treatment of posttraumatic scars in three patients by fractionated CO^2 ablation, that associated chronic erosions and ulcerations healed [9]. A second study by Phillips et al. explored the use of fractionated CO^2 ablation in chronic, lower extremity ulcers. After the failure of wound care therapy for at least 6–8 weeks, these authors found accelerated wound healing in three geriatric cases of posttraumatic wounds [10]. A final study by Krakowski et al. explored the healing of chronic wounds using ablative fractional CO^2 resurfacing in two pediatric patients [11]. In this study, the chronic wounds were due to a chemical burn and a cryotherapy injury, respectively. Both wounds were between 1–2 cm in diameter and remained epithelized at 4- and 9-months post laser ablation [11]. No studies to date have explored fractionated laser resurfacing as a method to heal nonhealing thermal burns, nor have they utilized the Erbium:YAG laser.

Here we report a single case of the use of the Erbium:YAG laser on the treatment of hypertrophic burn scarring, secondarily leading to the healing of an associated, nearby chronic ulceration. Larger studies are required to both confirm this effect on chronic thermal wounds, as well as compare the efficacy of the CO^2 versus Erbium:YAG laser in such treatments.

Authorship contributions

Study conception and design: Madni, Lu, Kenkel, Hoopman, Phelan.

Acquisition of data: Madni, Lu, Imran, Clark.

Analysis and interpretation of data: Madni, Lu, Kenkel, Hoopman, Phelan.

Drafting of manuscript: Madni, Lu, Imran, Clark, Hoopman, Phelan, Kenkel.

Critical revision: Hoopman, Phelan, Kenkel.

Conflicts of interest

The authors have no conflicts of interest to disclose. The patient has granted consent for the publication of his/her pictures.

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Letter to the Editor

"Consistency an issue?" – A review of UK burns service online information on burns first aid

Dear Sirs,

Burn injuries can have a major impact on an individual or family's quality of life. The physical, emotional and potential financial burden can be overwhelming no matter how insignificant the burn may initially seem to be [1].

Appropriate and timely first aid has been widely documented to reduce the burden significantly. Unfortunately, there is inadequate knowledge [2] and poor use of correct first aid by the general public [3]. For this reason, Medical staff are frequently treating burn injury patients who have had little to no first aid.

With the majority of the UK having access to the internet [4], burns first aid injury advice should be simple and straightforward to find.

Many of the Burns Units and Centres in the UK have allied websites with online advice available for their patients. Furthermore, some have advice on Burns referral guidance for our colleagues.

Consistency in online burns first aid information is vital in avoiding confusion by members of the public. Previous studies have shown inconsistencies in first aid information between websites searched through popular search engines [5,6].

The British Burn Association (BBA) website provides sufficient information surrounding first aid [7]. However, patients may look to locally run websites for first aid treatment. For this reason, a review was performed of all the websites associated with our UK burns services, specifically looking at the First Aid Information with the aim to assess the consistency between them.

In April 2017, all burns services listed on the BBA website were identified and those that had specific Burns first aid information were compared against a list of Pre-Defined domains. These pre-defined domains were sourced from the British Burn Association First Aid Position Statement compiled in 2014 (Table 1). Additional domains were added from the