Histopathological evidence of efficacy of microneedle radiofrequency for treatment of axillary hyperhidrosis

Sir,

A major concern about the treatment of hyperhidrosis is the lack of clinical guidelines. Many medical (e.g., Botulinum toxin type A) and surgical methods have been used to overcome excessive sweating with variable results.[1] Energy-based devices have recently gained increasing acceptance for the treatment of many skin disorders and cosmetic conditions including facial rhytides and skin laxity.[2,3] Recently, some researchers clinically evaluated the use of radiofrequency (RF) energy in the treatment of primary axillary hyperhidrosis (PAH), which suggest that the bipolar radiofrequency devices are effective in reducing the amount of sweating,[4,5] but very limited published data on histological confirmation of successful treatment is available.

We report the successful treatment of a 25 year old man with refractory primary axillary hyperhidrosis with fractionated microneedle radiofrequency (FMR). Topical treatment with aluminum chloride had been ineffective and the patient had discontinued it 6 months ago. He had received multiple sessions of botulinum toxin injections in the area, the last injection being 4 years ago. Systemic treatment with anticholinergic agents had to be stopped due to severe adverse effects.

The patient underwent four treatment sessions of fractionated microneedle radiofrequency FMR (INFINI; Lutronic, Goyang, Korea) at 2-week intervals. Pre-treatment results of the iodine–starch test are illustrated in Figure 1.

The procedure was performed in four steps. Step 1: Sizing of the area to be treated and marking that area after starch–iodine test. Step 2: Topical anesthesia under occlusion. Step 3: Placement of hand piece on designated areas to deliver the therapy. Step 4: Dressing with sterile vaseline gauze.

The following settings were used: microneedle penetrating depth of 2.5- to 3-mm, level strength of 6 to 9, and RF time of 140- to 180-ms.

The biopsy sample taken 30 days post-treatment showed reduction in the number and size of both apocrine and eccrine glands after treatment [Figure 2]. The density of sweat glands per low power field at base line and 30 days post-treatment was approximately 66 and 40, respectively. A mild lympho-histiocytic infiltrate, peri-glandular fibrosis, and neovascularization were identified surrounding the atrophic glands, suggestive of post-traumatic reactive changes. Coagulation changes of the glands (eosinophilic body) due to thermolysis is depicted in Figure 3.

The only adverse effects observed were erythema and pin point bleeding in the immediate post-procedure period [Figure 4].

The results of the iodine–starch test at the end of treatment are shown in Figure 5. During the 6-month follow-up, the patient had no recurrence.

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Fractionated microneedle radiofrequency is a minimally invasive method that utilizes microwave energy to heat...
the target tissue without destroying the epidermis, by using rapid penetration with microneedle.[7,8]

The radiofrequency energy from the tip of the microneedles causes direct thermal injury at the interface between deep dermis and subcutis, which results in thermolysis and decrease in the size and density of the apocrine glands,[9] while minimizing damage to surrounding tissue.

Johnson et al., studied the microwave thermolysis of sweat glands and demonstrated that microwave technology is well suited for targeting sweat glands while allowing for protection of both the upper skin layers and the structures beneath the subcutaneous fat. They demonstrated gross pathological and histological response with generation of thermally affected zones in the desired target region while providing protection to the upper skin layers.[10]

Kushikata et al., in serial skin biopsy samples taken post-treatment, showed progressively, necrosis of sweat glands, reduction of viable sweat gland structures, and peri-glandular fibrosis, suggestive of post-traumatic reactive changes.[11]

Our patients showed similar histologic findings of destruction of eccrine and apocrine glands and associated cell necrosis that localized at the junction of deep dermis and subcutaneous tissue.
A clear decrease of viable sweat gland structures was seen compared to baseline sample with a sparse inflammatory infiltrate.[5,10,12]

Even though fractionated microneedle radiofrequency can be used as an effective, harmless, and nonaggressive method for treatment of primary axillary hyperhidrosis, further studies are needed to confirm and clearly define the histopathological changes induced in the skin by radiofrequency.

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Scar examination in sporotrichosis: An additional tool for clinical diagnosis

Sir,

Sporotrichosis is a subcutaneous mycosis caused by a dimorphic, saprophytic fungus Sporothrix schenckii. It affects several animal species including humans, and usually occurs after inoculation of the fungus through the skin or mucosa following minor trauma.

The infection may be acquired during leisure activities, or occupationally among farmers and gardeners who come in contact with vegetables or soil. Transmission from cats via bites or scratches has been reported as the main form of transmission in Rio de Janeiro.[1,2] A feline epidemic was detected in 1998, which was accompanied by an increase in the number of human cases suffering from sporotrichosis.[3] At the Evandro Chagas Infectious National Institute, 13 cases were registered between 1975 to 1997, 759 cases from 1998 to 2004, and 804 cases from 2005 to 2008.[4] In 2013, the number of new cases remained high and no reduction was expected in the short term.

The characteristic cutaneous lesion is a gumma, but it may be verrucous, plaque-like, nodular or ulcerated as well. Unusual clinical manifestations have been reported.[5] The disease evolves according to the patient’s immunity. Subclinical to localized forms with a solitary...
