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Use of Microwave for Sweat Control on Sites Other Than The Axilla

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Abstract

This study discusses the management of Compensatory Hyperhidrosis (CH), which has been very difficult to manage. Currently, various methods have been suggested as possible solutions for CH. Recently, a novel, emerging treatment involving microwave energy has been developed for nonsurgical reduction of sweating through ablation of sweat glands. Achieving long-term results this procedure is possible. We believe that our study makes a significant contribution to the literature because microwave thermoablation can be used safely and effectively to treat CH in a noninvasive manner.

Thoracic sympathetic surgery has been well known to be quite effective for the treatment of palmar hyperhidrosis, but the management of Compensatory Hyperhidrosis (CH) has been reported to be very difficult [1]. The incidence of CH differs in various reports. Approximately 35% of cases are severe and regretful to surgery [2]. CH is a severe condition that greatly decreases the quality of life and negatively influences social activities, especially during the hot summer months (Figure 1). Thoracic sympathetic surgery is permanent and practically irreversible.

Currently, various methods have been suggested as possible solutions for CH. Pharmacological modalities have no significant effect and can only play an auxiliary role in severe CH. To date, the most obvious alternative is botulinum toxin injection, which is temporary, lasting only for a few months. However, it is expensive and requires a considerable high consuming dose, and repeated injections pose difficulties. A surgical approach is clip removal and reconstruction of sympathetic chains by using free sympathetic graft (T5–T8) to relieve CH [3]. Reconstructive surgical method is believed to be theoretically reliable in terms of effectiveness; it lacks clinical data regarding the effects and adverse effects on the cardiovascular system or other organs.

Recently, a novel, emerging treatment involving microwave energy has been developed for nonsurgical reduction of sweating through ablation of sweat glands. Achieving long-term results with this procedure is possible. Previously, a microwave thermoablation system has been reported to be safe and effective in the long-term treatment of axillary hyperhidrosis [2]. However, to the best of our knowledge, reports describing its applicability in CH are scarce, and more clinical data are needed [4].

The microwave thermoablation system is used for the armpits with FDA approval, has a clinical efficacy of 82% for the armpit, and provides a rationale for treating CH [5]. Considering that sympathetic surgery is an irreversible method, microwave thermoablation has the advantage of being noninvasive and can be performed repeatedly.

Keywords: Hyperhidrosis; Microwave; Compensatory; Sweat; Axilla

Abbreviations

CH: Compensatory Hyperhidrosis

Case Presentation

We performed thermoablation by using MiraDry® (Miramar Labs, Sunnyvale, CA) in the sweat glands on the thigh (1 session), chest (6 sessions), buttock (2 sessions), and back (9 sessions) of CH from February 2018 to May 2019 in 8 patients (2 female and 6 male patients). The thigh, chest, and back were treated in separate days to prevent overdose of lidocaine. The mean age was 35.6 years, and the median duration of the symptom was 8.5 years. The median follow-up period was 6 months. The following procedure was used: (1) a line was drawn to approximate the target area

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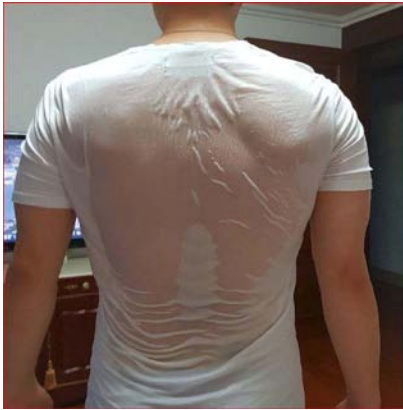


Figure 1: Severe sweating feature of compensatory hyperhidrosis on the back.



Figure 3: Application of microwave on the focal region of the back.



Figure 2: Drawing a line as A4 size region before applying the microwave ablation.



Figure 4: The maximum energy setting (level 5) has been applied to the affected area.

depending on each patient's sweating area as limiting A4 size (Figure 2); (2) tumescent anesthetic was applied to the whole targeted area. Before 2018, we used a long needle to inject the tumescent solution, and a new fresh technique was applied in 2018 with benefit of shortening the time in anesthetic procedure and skin cooling; and (3) the maximum energy setting (level 5) was applied on the trunk (Figure 3). The energy of the microwave was delivered as level 5, which affected sweat glands at a depth of 3-5 mm from the skin after tumescent anesthesia over the whole targeted focal surface (Figure 4). The severity of sweating on CH in treating regions was improved from severe to moderate with high satisfaction.

The side effect of this treatment modality consisted of localized small bullae (two patients), self-subiding scrotal swelling due to down migration of tumescent solution (two patients), biotip suction marks on the skin (Figure 3), and minor burning sensation for 1-2 days in most patients. No permanent complications were observed, and further sweating in other areas was not observed.

Conclusion

Although this report has described promising results as a preliminary experience, its limitations include the use of the biotip (10x30 mm) designed for the armpit, a small sample size, different characteristics of the trunk from that of the armpit, A4 size on the trunk, cost, and short-term follow-up. However, this preliminary

experience will provide clinical data for future large, well-structured studies with improvement of the device. This procedure requires further research and development of devices suitable for different regions of the body because permanent results can be expected.

CH, the most recognized and common side effect of endoscopic thoracic sympathectomy, is disruptive because afflicted individuals may have to change sweat-soaked clothing twice or thrice daily during summer. Large untreated areas of the body, most commonly the chest and back of the trunk, may sweat excessively. CH is difficult to treat and lacks an efficient, available treatment modality. Microwave thermoablation can be used safely and effectively to treat CH in a noninvasive manner. It is a promising technique as it plays a significant role in the treatment of focal hyperhidrosis, especially in CH as a second-line treatment option.

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