

Treating Axillary Hyperhidrosis/Bromidrosis with VASER Ultrasound

By George W. Commons, M.D., F.A.C.S.

Objective

Treatment of axillary hyperhidrosis/bromidrosis

Patient Selection

Primary axillary hyperhidrosis is a disorder characterized by excessive uncontrollable underarm sweating with no discernible cause [1, 15]. Often the condition is associated with offensive axillary odor, referred to as osmidrosis. When both symptoms are present (axillary hyperhidrosis + axillary osmidrosis), the condition is defined as axillary bromidrosis [12].

A 2004 survey of 150,000 households estimated that axillary hyperhidrosis affects 4.3 million individuals in the United States; a population that was previously under reported [11]. Hyperhidrosis with or without bromidrosis most often begins at puberty and has a significant negative impact on social, professional, and emotional aspects of patients' lives. Many patients are not aware that their condition is treatable and seldom seek the help of a physician. Many authors agree that if these patients can be identified early, improvements in a patient's quality of life can be made and the negative social and psychological consequences of axillary hyperhidrosis/bromidrosis can be avoided [1-3, 6-8, 10].

Current methods of treatment for axillary hyperhidrosis/bromidrosis include prescription strength antiperspirants containing 20% aluminum chloride, injections of botulinum toxin type A, excision of axillary tissue, liposuction of the axillary tissue, and transection of the sympathetic nerve. These methods are either irritating to the skin, costly and temporary, or pose significant, unpredictable surgical risks to the patient.

Treating Axillary Hyperhidrosis with the VASER

On the day of surgery patients are instructed to avoid wearing any antiperspirant products or lotions, and are instructed not to shave their underarms the day before surgery to make the borders of the hair-bearing areas easy to identify. The area of maximal sweating corresponds very closely to the hair-bearing area of the axillae [4-6, 13, 14].

Patients were treated in one of two positions:



FIGURE 1a. Location of incision for position 1. Patients are placed in the supine position, with arms abducted 90 degrees on armrests. The site for the incision is chosen to lie within a natural axillary crease at the anterosuperior border of the axillary hairline.



FIGURE 1b. Location of incision for alternate position. Patients reclined in the supine position with hand held behind their head and elbow relaxed to the side. One incision is made in the inferior axilla below the hair-bearing area

The surgical field is widely prepped and draped, covering the borders of the axilla with sterile towels. The hair-bearing area plus one centimeter beyond the perimeter of the hair-bearing area is used to define the targeted area for treatment. Use the VASER probe to determine the extent and reach of the tip of the probe. Move the incision or consider the next longest VASER probe for large axillae, see discussion and Figure 2.

Local anesthetic (1% lidocaine with epinephrine) is used to make a wheal at the proposed incision site. A small stab incision (.5 cm) is made with a #11 blade. A short 16-gauge or 18-gauge infusion cannula is used to infuse tumescent solution, consisting of a mixture of 500cc of Lactated Ringers, with 100cc's of 1% plain lidocaine, and ½ ampule of 1:1000 epinephrine, throughout the axillae and at least one centimeter beyond the identified boarder. The small diameter infusion cannula is important for the comfort of the patient. A total of 250cc-350cc (depending on axilla size) is infiltrated in each marked axillary region at a slow infusion rate of 100cc/ min to 150cc/min, see the Table 1 below for volumes. Wetting solution is placed in the tissues all the way back to the incision site.

Table 1. VASER Amplitude, Application Time, and Fluid Volume for 3 Sizes of Axilla.

Size of Axilla	Infusion per Axilla	Phase 1 (amplitude-minutes)	Phase 2 (amplitude-minutes)
Small	250cc	80% C – 5 minutes	70% C – 5 minutes
Medium	300cc	80% C – 6 minutes	70% C – 6 minutes
Large	350cc	80% C – 7 minutes	70% C – 7 minutes

It is important to use sufficient volumes of infiltrate as the infiltrate is dissipated rapidly in the axillae. The vasoconstriction from the epinephrine at 1:500,000 concentration is sufficient after 8-10 minutes, but the numbing effect of the lidocaine can take an additional 5 minutes to be sufficient. An additional 50cc-100cc of infiltrate may be added just before application of the VASER if more than 20 minutes has elapsed since initial infusion to provide the proper fluid environment for the VASER. After blunt dilation with a Kelly clamp, a protective plastic skin port (part of VASER System) is placed in the stab incision, and sutured in place with 4-0 Prolene at three anchor points. A 2.9mm diameter, 3 ring, 11cm long VASER probe is used for the treatment. See Figure 2.



Figure 2. VASER probe: 2.9mm diameter, 3 ring, 11cm long

The treatment takes place in two phases. In Phase 1 the amplitude setting is 80%, continuous mode. The probe is passed superficially in an even fashion throughout the subdermal plane with radial strokes, extending to the marked +1cm border. Care is taken to monitor the skin surface temperature. Very gentle warming of the skin is acceptable, resulting from the superficial application of the VASER, but hot spots or any form of excessive heating should be avoided. When an area of skin starts to warm, the probe is moved to another area and the treatment continues. The goal in Phase 1 is to complete a ‘discontinuous

release' throughout the targeted area, resulting in smoother passage of the VASER probe. See recommended treatment times in Table 1.



Figure 3. Gentle reverse curettage motion with VASER probe

Avoid pressing the tip of the probe into the thin-skinned area which may result in an 'end-hit' and never sweep the probe from side to side.

In Phase 2, the amplitude setting is reduced to 70%, continuous mode, to reduce the applied energy. Again, the probe is passed superficially in an even fashion throughout the subdermal plane using radial strokes extending to the +1cm border. The probe is kept flat (parallel) to the skin surface as much as possible. Once the entire targeted area has been treated, a *gentle* superficial reverse curettage technique is applied to the backstroke of the VASER probe, keeping the probe tip nearly parallel to the skin surface, again covering the entire treated area, as shown in Figure 2.

This technique is used **ONLY** on the backstroke, never the forward stroke. This is an extremely superficial application and is an important and highly effective part of the treatment. Care is again taken to monitor the skin surface temperature. See recommended treatment times in Table 1.

Aspiration Phase

A short 3.0 mm VentX aspiration cannula (part of the VASER System) is used to evacuate the liquefied tissue and fluids, yielding 25-50cc of aspirate. ***The aspiration phase is gentle and short in duration, used only to remove free fluids and tissues, not to strongly scrape the subdermal surface.***

The protective port is removed; no drains are placed. The incision is closed with deep dermal resorbable sutures, and the wound is covered with Tegaderm. Cotton batting is placed over the axillae and secured with two Kerlix rolls.

Post-op Care

No activity restrictions are placed on the patient, who is asked to return for removal of the bulky dressing the following day. No further dressing changes are needed. Pain is usually moderate to minimal immediately post-op and may require oral pain medication for post-op day 1. Pain drops significantly on day 2 and is minimal to absent by day 3.

Conclusion

The VASER is safe and effective for treatment of axillary hyperhidrosis/bromidrosis. This method is minimally invasive with immediate return to basic activities and only temporary minor restriction of arm movement. The major keys to success of the operation include sufficient treatment time and amplitude settings and infusion of sufficient volumes of wetting solution. If an insufficient volume of wetting solution is used, the superficial treatment can result in very rapid heating of the tissues and the recommended treatment times listed in Table 1 would be excessive. If insufficient treatment time is used the patient may experience a recurrence of some level of sweating around months 5-6. It is important to understand that the VASER is used to treat the underside of the dermal layer directly, i.e., superficially, not at some intended depth away from the bottom side of the dermal layer.

The key to patient satisfaction is to discuss with the patient preoperatively that the surgical objective is not "100% elimination of sweat and/or odor" but rather significant reduction of sweat and odor to a range

from normal to completely dry. Patients can expect to be completely dry for the first few months following surgery but some patients may find a slight return of sweating (still far below pre-operative levels) within the first 6 months.



Dr. Commons is a board certified plastic surgeon and is an adjunct clinical assistant professor at Stanford University School of Medicine. He is a senior partner at the Palo Alto Center for Plastic Surgery in Palo Alto, CA. Dr. Commons earned his medical degree from the University of Pennsylvania in 1968. He went on to complete his fellowship in plastic surgery and Rehabilitation followed by his residency in general and plastic surgery at Stanford University Medical Center.

Dr. Commons has extensive body contouring experience with earlier generation UAL devices for lipoplasty. Due to the extremely superficial application of the ultrasound energy for the axillary hyperhidrosis treatment described in this article, it is not recommended that earlier generation UAL devices be used for this procedure due to the tissue trauma and heating noted for these earlier generation devices in lipoplasty [9].

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