Thermage: Monopolar Radiofrequency

Monopolar radiofrequency treatment may be appropriate for patients who desire skin tightening but will not tolerate surgery and/or downtime. Patients generally can expect a 5% to 20% improvement, but results in any particular group are unpredictable. Key to this treatment is providing patients with detailed information to ensure that expectations are realistic. (Aesthetic Surg J 2005;25:638-642.)

As a plastic surgeon, my first choice in treating skin laxity is using standard aesthetic surgery techniques. However, for patients who do not want to undergo surgery and cannot or will not tolerate any downtime, monopolar radiofrequency (MRF) may be a useful treatment. Here, I write exclusively about the Thermage ThermaCool device (Thermage Inc., Hayward, CA).

Thermage MRF, as discussed in multiple peer-reviewed scientific and clinical studies, has proven to be the best option for nonsurgical tissue tightening. Other radiofrequency (RF) devices on the market claim effectiveness but, being bipolar, cannot produce a uniform volumetric heating that is at all comparable with MRF. Further, the bipolar RF devices are frequently combined with other light-based technologies, making it difficult to assess what role, if any, bipolar RF plays in treatment outcomes.

The goal of this article is neither to endorse nor criticize Thermage ThermaCool treatment, but to discuss how this technology may be used in an aesthetic surgery practice. In considering its use, it is important to understand some basic RF concepts as well as its mechanism of action (see sidebar and Figure 1).

Treatment Protocol

When Thermage initially came on the market, the treatment protocol favored maximum tolerable energy applied in a single pass. The problems resulting from this approach were high variability in effectiveness and painful treatments. In addition, an infrequent but worrisome number of tissue depressions were reported, occurring primarily over the thin skin of the temple and the mid cheek. The only occurrence of this complication in my practice can be seen in Figure 2. The problem was corrected with a single fat graft.

The new treatment protocol is not only recommended by Thermage but also by a consensus conference sponsored by Thermage (Orlando, FL, April 2005) of frequent Thermage users from multiple specialties. This new protocol is based on the science demonstrating greater effect on tissue with multiple passes at lower energies and also on research by Ross1 showing the special tissue effect on fibrous septae:

1. Patient feedback about heat sensation is a valid and preferred method for selecting the optimal amount of energy to use, and the target is between 2 and 2.5 on a pain scale of 1 to 4, with 1, none to mild; 2, mild to moderate; 3, moderate to severe; and 4, intolerable. Although pain is used as feedback, severe pain must be avoided, not only for reasons of patient comfort but, more importantly, for patient safety. Excessive pain indicates excessive heating of the tissues. It is important to note that local tissue impedance varies from patient to patient; therefore, attention to the pain level of each patient should be the utmost priority.

2. Multiple passes at moderate energy settings yield substantial and consistent efficacy. In my practice, an average of 150 to 300 high-energy pulses laid down with 1 or 2 passes were used per patient with the original protocol. With the new protocol, we now average 700 to 850 moderate-energy pulses, using as many as 5 to 6 passes over selected areas.

3. Treating to a clinical end point of visible tightening and contouring maximizes predictability and long-term results. I treat half of the face to the point of visible tightening. When this immediate end point is
achieved, effectiveness is enhanced and variability is reduced (Figure 3).

**Results**

Using these new guidelines, the consensus conference advisory panel reported greatly enhanced results. The percentage of patients who saw any change at all at 6 months increased from 54% to 92%, respectively. Although these results were not peer-reviewed, there have been many peer-reviewed publications that support improvement with Thermage in almost all skin parameters measured.

The amount of clinical improvement with Thermage continues to vary. I have been unable to predict treatment results in any particular patient group. Figure 4 represents one of the best published results I have seen.\(^2\) I have not been able to achieve a comparable result. Although this kind of dramatic result is possible, it should not be expected in most patients. The patient in Figure 5, B is more representative of the noticeable result from Thermage that I commonly see in my practice. This result, although subtle, is nevertheless achieved without significant downtime. In an effort to avoid overselling the treatment, and to give patients realistic expectations, I show patients similar results.

The keys to success with Thermage are patient selection and management of patient expectations. In my practice, any patient who desires tightening but refuses...
surgery is a potential candidate for Thermage. I emphasize to patients the variability of results and express that 80% to 85% will see some improvement, but improvement may be subtle. One can expect a 5% to 20% improvement in tightening. A lucky few may receive more improvement, and an unfortunate few may see no appreciable tightening. I discuss this with my patients in great detail. Presented with frankness and honest
Figure 5. A, Pretreatment view of a 35-year-old woman. B, Posttreatment view 3 months after undergoing Thermage treatment of mid/lower face and neck at 13 (89 J) to 15 (124 J) with 1-cm tip.

Figure 6. A, Pretreatment view of a 74-year-old woman. B, Posttreatment view 6 months after undergoing multiple passes. Each leg was treated at 13.3 (97 J) to 14 (106 J), 300 pulses, up to 3 passes on the upper thigh and knee using the grid.

Figure 7. A, Pretreatment view of a 51-year-old woman. B, Posttreatment view immediately after a single Thermage treatment with multiple passes. C, View 2 months after treatment. Reprinted with permission from Thermage.
informed consent, Thermage MRF has earned a credible role in my practice.

Currently, you can target different tissue depths by altering treatment tip sizes and pattern of the dielectric thermocouple. In the future, larger tips will also expedite treatment times. Use of the device in areas other than the face has been accomplished with some success (Figures 6 and 7). There is great interest in combining Thermage with other modalities, such as superficial and standard laser resurfacing, Fraxel, Botox, and fillers. Recent porcine studies have demonstrated the safety of using Thermage MRF with fillers.1

Discussion

My practice consists of a full array of services, ranging from basic skin care, to comprehensive nonsurgical technology, to aggressive surgical options. Thermage may be useful to the clinician who wants to offer a full-service practice to patients who absolutely refuse surgery and have realistic expectations about this treatment.

However, for the surgeon with a more conservative approach, Thermage may not offer enough benefit to warrant its use. It does require time and effort to manage expectations, providing high quality and detailed information to guarantee informed consent. In my practice, many patients who have been treated with Thermage have then undergone appropriate surgical procedures, satisfied that they had first explored all nonsurgical options. Thermage has also played a role for postsurgical patients who want no further surgery but welcome nonsurgical tightening. Further refinements in this protocol and technology will greatly enhance the effectiveness and predictability of this treatment.

Each aesthetic surgery practice has a unique personality and its own biases. It is unfortunate that some physicians have misled the public by presenting Thermage as a “nonsurgical face lift.” This position is false, misleading, and strongly opposed by the company itself. ■

Editor’s note: Dr. Burns is a member of the scientific advisory board of Thermage and Cutera. He has received speaking honorariums and research funding from Thermage. He has also received teaching honorariums from Thermage, Lumenis, Reliant, and Sciton. He owns no stock in Thermage.

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