





Patient Demand Fuels Proliferation of Innovative Skin Tightening Devices

By Michael Moretti, Editor

Despite a soft global economy, demand for body shaping and skin tightening have remained strong with practitioners performing close to four million procedures in 2009 and earning fees in excess of \$2.3 billion. This sustained demand has given rise to novel deliveries of radiofrequency (RF), ultrasound and laser energy to tighten skin both immediately and progressively as part of an overall body contouring regimen program.

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Abdomen before Tx



Abdomen six months after Thermage Tx
Photos courtesy of Bill Johnson, M.D.



Abdomen before Tx



Abdomen three months after Thermage Tx
Photos courtesy of Robert Weiss, M.D.

Featuring high-frequency, shortwave RF technology (40 MHz wavelength), the Accent^{XL} from Alma Lasers, Inc. (Buffalo Grove, Ill.) "appears to provide the most positive, consistent results for skin tightening and/or volume reduction in a non-invasive manner," said Richard Carlino, M.D., a plastic surgeon in private practice in Raleigh, N.C. The unique combination of unipolar and bi-polar technologies works in tandem to gradually heat the dermal and subdermal tissue, thus providing tightening and recontouring, both superficially and volumetrically. "More than anything else, the Accent^{XL} provides a more consistent mode of penetration."

The abdomen and thighs are the two most popular areas treated by Dr. Carlino, followed by the neck and face. Four to six sessions, once every two weeks, will typically achieve a 10% to 20% improvement in skin tightening. "Results are subtle to above subtle, but in 90% of cases we are meeting patient expectations," Dr. Carlino reported. Patients return once every 6 to 12 months for a single touch-up session.

Dr. Carlino is currently experimenting with a series of Accent^{XL} treatments combined with fractionated erbium to achieve skin tightening around the eyes for a non-surgical blepharoplasty.

Lisa Zdinak, M.D., a cosmetic laser surgeon with a private practice in New York City, N.Y., uses Exilis from BTL Aesthetics, Inc. (Columbia, S.C.), to tighten skin over the entire body. "Not only can we treat the body, but we can also treat the face with the same power source. Some other technologies require various tips and handpieces."



Lisa Zdinak, M.D.
Cosmetic Laser Surgeon
New York City, NY

Also using RF energy, the Exilis was originally developed as a body shaping device to help smooth the contours of the body, according to Dr. Zdinak. "However, by adjusting the cooling, we can focus on skin tightening also. Exilis works really well on areas that have been somewhat resistant to other technologies. Knees, arms and abdomen can be treated for unwanted fat deposits, as well as skin laxity."

Dr. Zdinak believes Exilis allows treatment at a deeper level – documented up to 2.5 cm – than competing RF devices because of the continuous cooling to the surface of the skin. "The more that we can stack the heat into the deeper tissues, the more skin tightening and body shaping we can achieve," she advised. "While other RF modalities rely on pre- and post-cooling, Exilis provides continuous cooling. This facilitates safer treatment at deeper levels."

The current protocol for treatment with Exilis is four sessions at two week intervals. "After four Exilis treatments to tighten skin on the arms or legs, a patient can lose 1" to 1.5," Dr. Zdinak reported.



Neil Sadick, M.D.
Clinical Professor of Dermatology
Weill Cornell Medical College
New York City, NY

A new treatment paradigm for Thermage from Solta Medical, Inc. (Hayward, Calif.), "achieves reproducible results for skin tightening in a single session," said Neil Sadick, M.D., a clinical professor of dermatology at Weill Cornell Medical College in New York City, N.Y. This revised paradigm for the monopolar RF system consists of four passes with lower energy levels. "For single treatment efficacy, I believe monopolar is superior to bi-polar RF," Dr. Sadick shared.

There are also various sized tips for changing the depth. "This allows for customized treatment around the eye, face and body. I believe Thermage is the only technology

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Before Tx After Reaction Tx
Photos courtesy of Ronit Hadadi (paramedical cosmetician, Rishon LeZion, Israel)



Abdomen before Tx



Abdomen after three Reaction treatments
Photos courtesy of Silviu D. Paun, M.D.



Submental before Tx Submental six months after VelaShape Tx

Photos courtesy of Lori Brightman, M.D.



Upper arm before Tx Upper arm six months after VelaShape Tx

Photos courtesy of Lori Brightman, M.D.

that provides customized skin tightening capabilities." Furthermore, patient discomfort is minimized with Comfort Pulse Technology (CPT).

Volumetric heating in the deep dermis occurs with one session for the face or body. "We're seeing good results for the abdomen, buttocks, thighs and upper extremities," Dr. Sadick conveyed. "Overall, 85% of patients achieve significant improvement in skin tightening of greater than 60% as demonstrated through clinical and photographic evidence. Excellent results are usually attained at six months, but improvement continues up to 12 months following treatment."

The Reaction is a novel multi-frequency, bi-polar RF system from Viora Ltd. (Jersey City, N.J.). Richard Smialek, D.O., a plastic surgeon in Westerville, Ohio feels that, "compared to competing RF technology, results for skin tightening can be seen sooner over the treatment series, which on average is six to eight sessions (10 to 14 days apart)." The Reaction also includes simultaneous vacuum suction to maximize the penetration of RF energy when performing body contouring and skin tightening off the face. "You can treat into the superficial subcutaneous fat," Dr. Smialek noted.



Richard Smialek, D.O.
Plastic Surgeon
Westerville, OH

In Dr. Smialek's opinion bi-polar RF provides better patient comfort, safety and depth of penetration. In addition, the Reaction's four distinct RF frequency modes are pre-programmed by patented Channeling Optimized Radiofrequency Energy (CORE) technology. "For the forehead, you use the shallowest penetration since you are treating thinner skin, while on the lower face you can use progressively deeper settings," he said.

"Patient discomfort is minimal. No sedation or pre-medication is needed," Dr. Smialek advised. "After a series, patients can expect a better definition of the jowl line, a softening of the nasolabial folds and the marionette lines, elevation of the eyebrows and softening of crow's feet." Other body areas, such as the abdomen, upper arms, elbows and knees, can also be successfully treated with the Reaction.



Lori Brightman, M.D.
Dermatologist
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For skin tightening, VelaShape II from Syneron, Inc. (Irvine, Calif.) is an improvement over its predecessor in that it uses a higher level of RF. "In the small handpiece, wattage has increased from 20 W to 23 W, and in the large handpiece from 50 W to 60 W," said Lori Brightman, M.D., a dermatologist at Laser and Skin Surgery Center of New York in New York, N.Y., and Southampton, N.Y. "This increase allows you to attain your clinical end result quicker."

Besides bi-polar RF, VelaShape incorporates infrared light, vacuum and mechanical message. All four modalities can be used simultaneously through a single handpiece. Most patients on average undergo a total of six treatment sessions, about once a week. "Size reduction is a combination of tightening and shrinking the fat cells," Dr. Brightman said. "On the abdomen, you can expect a reduction of 2 cm to 4 cm, and between 1 cm and 2 cm on the thigh." Visible results start to occur within about three sessions, with final results appearing nearly three months after completing the last session.

With healthy diet and lifestyle, patients generally maintain results for at least six months, according to clinical trials. "VelaShape generates a certain amount of heat causing immediate contracture of the collagen fibers, as well as stimulation of the wound healing response for generating new collagen over time," Dr. Brightman said.

EndyMed PRO with 3DEEP is a unique multi-source phase controlled RF system that is manufactured by EndyMed Medical (Caesarea, Israel) and distributed in the U.S.

by Eclipse (Dallas, Texas). The device provides non-invasive skin tightening without the need for surface cooling. "Energy is alternated between six different electrodes for deeper penetration," explained Flor Mayoral, M.D., a dermatologist in private practice in Miami, Fla. "Most other RF devices are bi-polar with two electrodes: a positive and a negative, but the EndyMed PRO has three electrodes on the left and three on the right. Each electrode has the ability to become positive or negative, so energy can reach deeper into the skin. Maximum depth of penetration is 11 mm versus 1.5 mm with the usual bi-polar device."



Flor Mayoral, M.D.
Dermatologist
Private Practice
Miami, FL

"There is a built-in safety feature that prevents accidental burning of the skin if the hand-piece is not in complete contact with the treatment surface," Dr. Mayoral added. "Other bi-polar devices can accidentally arc and cause superficial burns. The EndyMed PRO will not emit a pulse if the handpiece is not in complete contact with the skin. The system also has the ability to measure the temperature, so if you reach a temperature above 40° C the device stops working – another safety feature that makes this procedure easy to delegate to other staff members," Dr. Mayoral conveyed.

Dr. Mayoral said 80% of patients should notice a visible improvement in skin tightening at four to six months after the final treatment, as documented by photography. Moreover, patients should continue to see results for 12 to 18 months," she said.



Marc Salzman, M.D.
Associate Clinical Professor of Plastic
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University of Louisville
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Marc Salzman, M.D., an associate clinical professor of plastic surgery at the University of Louisville, in Louisville, Ky., often combines two devices from Sciton, Inc. (Palo Alto, Calif.) for skin tightening: ProLipo *PLUS* and SkinTyte. ProLipo *PLUS* provides laser lypolysis (1064 nm and 1319 nm) which tightens from the inside out, whereas SkinTyte is infrared intense pulsed light (IPL) that tightens from the outside in.

"ProLipo *PLUS* is effective for skin tightening because you are creating sufficient heat in the subsurface of the skin once fat is removed," Dr. Salzman explained. The temperature rises to about 46° C and is measured by TempAssure, "which allows heating in the deep subcutaneous level and measures the direct effect of heat in the subdermal location to deliver efficacious, yet safe amounts of energy during treatment. This causes a direct injury to the collagen in the deep dermis," he said. "During the inflammatory phase of wound healing, neocollagenesis occurs for a tightening effect to the subsurface of the skin." SkinTyte also heats the skin to cause an injury and the same inflammatory cascade, "but enough cold to preserve the epithelium."

Patients schedule a single session of ProLipo *PLUS*, which is performed in the office under oral sedation and tumescent infiltration. This is followed two to three weeks later with three sessions of SkinTyte, spaced three to four days apart. "ProLipo *PLUS* alone might attain a 10% to 15% improvement, compared to an overall improvement of up to 25% with the addition of SkinTyte. The best results are with the neck and the anterior axillary fold," Dr. Salzman noted.

SlimLipo from Palomar Medical Technologies, Inc. (Burlington, Mass.) is a laser-assisted liposuction system that uses two wavelengths: 924 nm for melting fat and 975 nm for skin tightening. According to Jeff O. Angobaldo, M.D., a plastic surgeon with a private practice in Plano, Texas, the 975 nm wavelength has a higher affinity for water as opposed to fat and will heat the fibrous connective tissue, leading to collagen remodeling and skin retraction. "Histological slides have shown that selective heating of the connective tissue leads to thicker collagen bands, thus providing evidence for the retraction and tightening effects of the SlimLipo." The 924 nm wavelength also contributes to



Arm before Tx



Arm after SkinTyte Tx

Photos courtesy of Mark Salzman, M.D.



Arm before Tx



Arm two weeks after SlimLipo Tx

Photos courtesy of Jeff O. Angobaldo, M.D.



Before Tx



One day after SlimLipo Tx

Photos courtesy of Jeff O. Angobaldo, M.D.



Before Tx



After SlimLipo Tx

Photos courtesy of Jeff O. Angobaldo, M.D.

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Abdomen before Tx



Abdomen one year after Smartlipo Tx
Photos courtesy of Barry DiBernardo, M.D.



Arm before Tx



Arm five months after Smartlipo Tx
Photos courtesy of Christine Petti, M.D.



Arm before Tx



Arm after VASER Lipo Tx
Photos courtesy of Michael Nagy, M.D.



Before Tx After VASER Lipo Tx

Photos courtesy of Stephen Goldstein, M.D.

skin tightening by indirectly heating the septal fibers woven throughout the fat. "I have been impressed with the tightening I have achieved in areas where I normally would have made a longer incision; such as the upper arms, abdomen and male gynecomastia."



Jeff O. Angobaldo, M.D.
Plastic Surgeon
Plano, TX

Many areas of the body are prone to developing skin laxity after traditional liposuction. "In my experience, SlimLipo is highly effective for tightening of these areas, particularly the neck," Dr. Angobaldo advised. "Tightening can be seen immediately intraoperatively – about 30% – and continues to improve as the weeks progress."

Dr. Angobaldo estimates that 90% of skin tightening results with SlimLipo are apparent at three months. At the one year follow-up, "patients are pleased with their results. The skin remains tight and does not sag after the edema resolves," he said. "The 975 wavelength is really the wavelength of choice for tightening, reduction of sagging skin and a smoother contour."



Barry DiBernardo, M.D.
Clinical Associate Professor of Surgery
University of Medicine and Dentistry of
New Jersey
Montclair, NJ

Smartlipo Triplex from Cynosure, Inc. (Wesford, Mass.) provides three wavelengths: 1064 nm, 1320 nm and 1440 nm, two of which (1064 and 1320) target skin tightening. One study demonstrated a 20% improvement in skin tightening and 57% in skin elasticity when compared to traditional liposuction alone. "Smartlipo Triplex is an entirely new class of results," said study co-author Barry DiBernardo, M.D., a clinical associate professor of surgery at the University of Medicine and Dentistry of New Jersey, in Montclair N.J. "I can now treat larger areas and achieve excellent tissue tightening."¹

The blend of 1064 nm and 1320 nm is highly absorbed by water in the dermis, (the dermis contains 70% water). Hence, collagen is remodeled and skin thickened. Both wavelengths are used simultaneously during a single treatment session under local anesthesia.

A multicenter, prospective randomized study of the VASER Lipo System from Sound Surgical Technologies, LLC (Louisville, Colo.) "showed that VASER caused statistically significant skin tightening, compared to traditional suction-assisted lipoplasty," said study co-investigator Michael Nagy, M.D., a plastic surgeon in Toms River, N.J. "This is the first scientific study that proves a skin tightening effect from a device."



Michael Nagy, M.D.
Plastic Surgeon
Toms River, NJ

For the 20 patient contralateral study, a total of 33 areas were treated. One side of the patient was randomized to either a single treatment of VASER in the operating room or standard suction-assisted liposuction. Skin retraction was evaluated with black light tattoo marks out to six months. "At six months, VASER demonstrated a 53% improvement in skin tightening versus a marginal effect with traditional liposuction. These are better results than I anticipated," Dr. Nagy pointed out. "I think the ultrasound energy of VASER heats the underside of the dermis and contributes to the tightening of the collagen in the dermis. I also believe that treating the fat cells closest to the underside of the dermis allows for more tightening as well. There is an off-loading effect." ■

Reference:

1. DiBernardo B. *An evaluation and comparison of skin shrinkage and skin tightening: Smartlipo MPX™ vs. Liposuction.* January 2009.