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Advances in lasers have greatly improved outcomes for several procedures

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Advances in lasers are driving greatly improved outcomes in a variety of dermatologic procedures, such as tattoo removal, treating pigmented lesions, facial rejuvenation, skin tightening, removal of cellulite and fat, and body contouring.



‘Even if you’re not using some of these specific devices in your practice, you need to keep abreast of what’s happening out there,’ M. Christine Lee, MD, MPH, said.

“We use different lasers for cosmetic and medical purposes. This is important because dermatologists are considered leaders in the field in terms of any treatment of the skin,” said M. Christine Lee, MD, MPH. “Many of the cosmetic and aesthetic lasers do amazing things to alter the appearance of skin.

“It would serve our specialty well if all dermatologists, even if they do not own these lasers, at least kept current on the latest in the vast array of treatments that are available to patients. If they do not have the laser, they can speak about it with knowledge and be able to direct patients to the appropriate doctors who can treat them.”

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Dr. Lee, of The East Bay Laser & Skin Care Center, Walnut Creek, California, presented “Laser Update: Practical Applications for Dermatology” during Friday’s Plenary session, in which she introduced the first nonablative Erbium:YAG laser to U.S. physicians. Dr. Lee expounded on the latest advances in lasers in her presentation and provided additional commentary in an exclusive interview with *AAD Meeting News*.

Skin tightening

Skin tightening is an area where a great leap has been made in the use of lasers through the use of the first nonablative Erbium:YAG laser, the SP Dynamis from Fotona.

“This laser is the only Erbium that treats and heats the skin very deep without causing any burn to the surface,” Dr. Lee said.

“Because of the very specific properties of this nonablative fractional Erbium, we can use it inside the mouth. Traditionally it is used for dental procedures.”

The laser offers “amazing skin tightening” through the immediate contraction of the skin, she said.

“It looks on the outside like the nasolabial fold is gone, and this is without filler,” Dr. Lee said. “This is the first laser to have this effect. Most other lasers have not been able to do much with the nasolabial fold. When you combine it with other lasers to do tightening on the outside of the face, then globally you can get even more skin tightening.”

In her Plenary presentation, Dr. Lee introduced the laser in the U.S. by showing a video of the laser being used. It has a four-step process using various handpieces that can even be used on the earlobes, forehead, scalp line, and vagina. The nonablative Erbium can be used in the scalp to lift the forehead without harming the hair follicles.

The SP Dynamis also has a unique nonablative fractional Nd:YAG (Frac3) and super long-pulsed Nd:YAG (Piano) that, when used in conjunction with the nonablative Erbium, can provide even greater skin tightening.

“This Laser4D approach is more versatile and effective than any

combination of lasers that I've seen," said Dr. Lee. "The best part is it's fast, painless and no recovery time."

Tattoo lasers

Lasers for the removal of tattoos and treatment of pigmented lesions have taken a quantum leap in the last two years with the development of Cynosure's picosecond laser which at 750 picoseconds has seven times shorter a pulse duration than lasers with the next shortest pulse duration of 5 nanoseconds. In addition, nanosecond lasers with more wavelength options and higher peak power have also been developed. The bottom line is that troublesome tattoos of all colors can become history.

Skin cells swallow up the pigment injected by tattoo artists so that under a microscope they look like rocks, Dr. Lee said. Earlier generations of lasers broke the "rocks" down into "pebbles" that were carried away by blood and lymphatics. Picosecond lasers turn those pebbles into "sand."

"To remove a tattoo, you have to disrupt the pigment, so you deliver the laser to the target — the color of ink inside that cell," she said. "It causes an effect almost like an explosion due to photoacoustic and photomechanical effects, and releases the ink particles into the surrounding interstitium."

In addition, the Cynosure picosecond laser with its 755-nanometer wavelength is the first laser to effectively remove resistant colors — blue and green. Still, it is not effective in removing other colors, but the Fotona QX-Max Q-switched laser, distributed through Lumenis, has helped fill that gap, Dr. Lee said.

Q-switched lasers are nanosecond lasers that offer traditional 532 and 1064 wavelengths, as well as 585 and 650 wavelengths that effectively remove other colors, including yellow and red. The Fotona Q-switched laser has greater power than other tattoo lasers.

"When you compare it to other Q-switched nanosecond lasers, it will remove all the colors in half the number of treatments because of the higher peak power and it will treat resistant colors more effectively than any other Q-switched laser," Dr. Lee said.

Still other options are the Cutera Enlighten and a new laser from Syneron. Both combine a picosecond and nanosecond laser with 532 and 1064 wavelengths in one package. They allow all colors to be removed and have shorter pulse duration to be more effective at shattering ink particles, she said. Neither of these lasers is approved by the FDA.

Face and body rejuvenation

In facial and body rejuvenation and fractional resurfacing, chemical acid peels and CO2 lasers have been the traditional treatments, but a new fractional device is a step forward.

The Lumenis M22 combines intense pulsed light (IPL) with a fractionated device. After treatment, patients have only two or three days of downtime, with minor redness and swelling, Dr. Lee said. IPL is the gold standard for photorejuvenation to treat rosacea and freckling, as well as issues related to sun damage, pigmentation, and vascular problems.

The gold standard for treatment of individual vascular and pigmentary lesions is a dual long-pulsed Nd:YAG and KTP combined-in-one system called the Excel V (Cutera), previously known as the Gemini laser. These lasers target and penetrate deeper than IPLs, which allows for better clearance of individual lesions than IPL.

“IPL allows for faster treatment of large areas whereas KTP and Nd:YAG lasers allow for better clearance of individual lesions,” said Dr. Lee. “I recommend using these in combination.”

Adding the fractionated device that comes with the M22 addresses surface textural irregularities and wrinkles. It is similar to the effects of fraxel (fractionated Erbium), but with less downtime.

Still, fractional CO2 lasers produce better results but have more downtime, Dr. Lee said. Several companies make fractional CO2 lasers that have pros and cons, such as varying power levels and ability to control the device. Lasers with higher power provide better results but may have longer healing time. The advantage of a laser with higher power is that users can decrease the power as needed. The ActiveFX/DeepFX/TotalFX (Lumenis) is the highest powered fractional CO2 laser on the market. Other fractional devices are lower powered, which would not give the same level of results.

Another option for resurfacing is fractionated Erbium lasers, which have less downtime than CO2 lasers, but deliver less effective results.

“The less downtime, the more treatments you have to do and not have as dramatic a result,” she said. “It is the difference between making someone look 20 years younger versus five years younger. Downtime difference is one week versus two or three days looking like they have a bad sunburn.”

Cellulite

The FDA has approved the use of the first laser to treat cellulite, the Cellulaze, a 1440 nanometer laser from Cynosure.

“It is invasive; it is like laser-assisted liposuction,” Dr. Lee said. “You have to insert the laser under the skin. You make an incision to insert the laser and it breaks up the fibrous septae that are the root cause of cellulite.

“Women have vertical fibers, which allow for bulges to form in the skin. When you get under the skin and sever those fibers, it helps to loosen the bands and smooth the skin, getting rid of those bulges. After one treatment, you can get about 50-60 percent reduction in cellulite, but that is better than any other treatment available.”

Previous treatments for cellulite were temporary and had only a 20-30 percent improvement.

Body contouring and fat melting

Several companies claim their devices melt fat, but only three can prove their devices work, Dr. Lee said.

One is Lipsonix (Solta/Valeant), which uses high-intensity focused ultrasound. It is thermal ultrasound that creates heat to melt the fat under the surface of the skin. It reduces one inch of fat per treatment per area, she said.

Coolsculpting (Zeltiq) takes a different approach by freezing fat. It uses suction pads applied to the skin to reduce fat. Two or three treatments in the same area remove one inch of fat.

Ultrashape (Syneron) is an ultrasound device that uses nonthermal

pulsed ultrasound to reduce fat. It works via a process called “cavitation” that causes disruption of fat through vibration. Three or more treatments in the same area remove one inch of fat.

“There is little to no science for other devices,” Dr. Lee said. “There are a lot of machines that utilize ultrasound, but they are not therapeutic ultrasound; they use energy similar to diagnostic ultrasound. The other devices use the same type of frequency and depth of penetration as ultrasound used for physical therapy, which are used to massage muscles and deep tissue. They just do massage; they do not melt fat.”

There have been several advances in laser technology that can help physicians incorporate treatments to enhance their patients’ health and well being, and supplement their cosmetic procedures, she said.

“There are a lot of medical applications for many of these devices. The general dermatologist and surgical dermatologist should keep educated about these advances and be able to help advise their patients about the best treatments.” Dr Lee said. “What is most important is to do a proper evaluation and be knowledgeable about the various treatments so you can advise patients on what is most applicable to them in treating their condition.”

“Even if you’re not using some of these specific devices in your practice, you need to keep abreast of what’s happening out there,” Dr. Lee added.

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