Analytical Report

Candela AlexTriVantage™

FOR LASER TATTOO AND PIGMENTED LESIONS REMOVAL

By David Cauger, Contributing Editor

A few months ago I reviewed the MedLite C6 tattoo removal laser from Hoya ConBio (May-June 2006). At that time, I wrote extensively about the tattoo market in general, challenges in removing multi-colored tattoos, and what to consider before incorporating tattoo removal into an existing aesthetic practice. I hope the readership found the article useful.

Obviously the most important consideration before adding tattoo removal capabilities to one's practice is the laser of choice. Seizing upon the growing popularity of tattoos and the inevitable growth of the tattoo removal market, Candela has created a triple wavelength Q-switched laser. This is a remarkable feat of engineering because the 755nm Q-switched laser pumps solid-state handpieces to generate 1064nm and 532nm wavelengths. The versatility of this laser reminds me of the VersaPulse™ that boasted three Q-switched frequencies. The VersaPulse was a classic laser for tattoo removal but was dropped from the Lumenis line some time ago.

Candela's **AlexTriVantage** not only treats most tattoo colors but also a wide variety of dermal and epidermal pigmented lesions. Furthermore, due to the fact that the laser uses a fiber as opposed to the typical articulated arm, the "hot spots" and subsequent pinpoint bleeding, often associated with treating pigmented lesions with the Q-Switch laser are eliminated.

Candela Corporation (NASDAQ: CLZR) has essentially re-tooled its existing AlexLAZR to create the AlexTriVantage (ATV) to position itself in the anticipated burgeoning tattoo marketplace. All of this is nice, but it is the technical innovation I really like.

"LASER-PUMPED-LASER" HANDPIECES

The AlexLAZR is the "base" product from which Candela created the AlexTriVantage. The AlexLAZR is a Q-switched alexandrite laser used for treatment of pigmented lesions and for green, blue, and black tattoo removal. The nominal specifications of the laser are a wavelength 755nm, pulse energy is 800mJ and pulse duration is 50 ns. Output of the laser is delivered via a 1.5mm core diameter optical fiber to a "handpiece" which then focuses the light through the selected spot size to the target in the skin.

The "Laser-Pumped-Laser" concept at the heart of the new AlexTriVantage includes new 532nm and 1064nm handpieces which are offered as upgradeable accessories to the base AlexLAZR. Unlike conventional 1064nm and 532nm lasers that are

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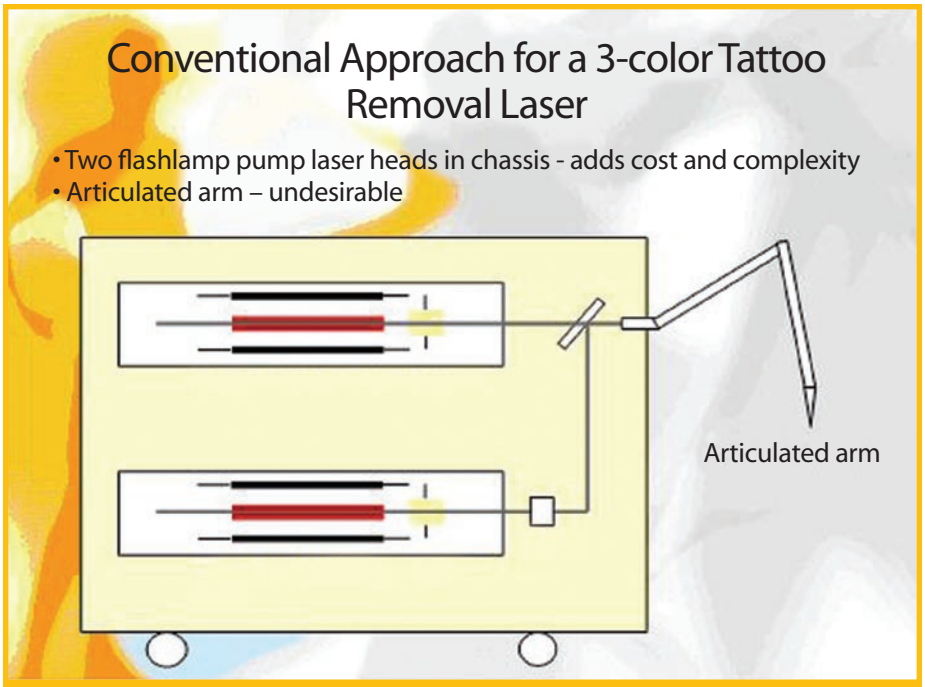

Figure 1: Conventional Approach.

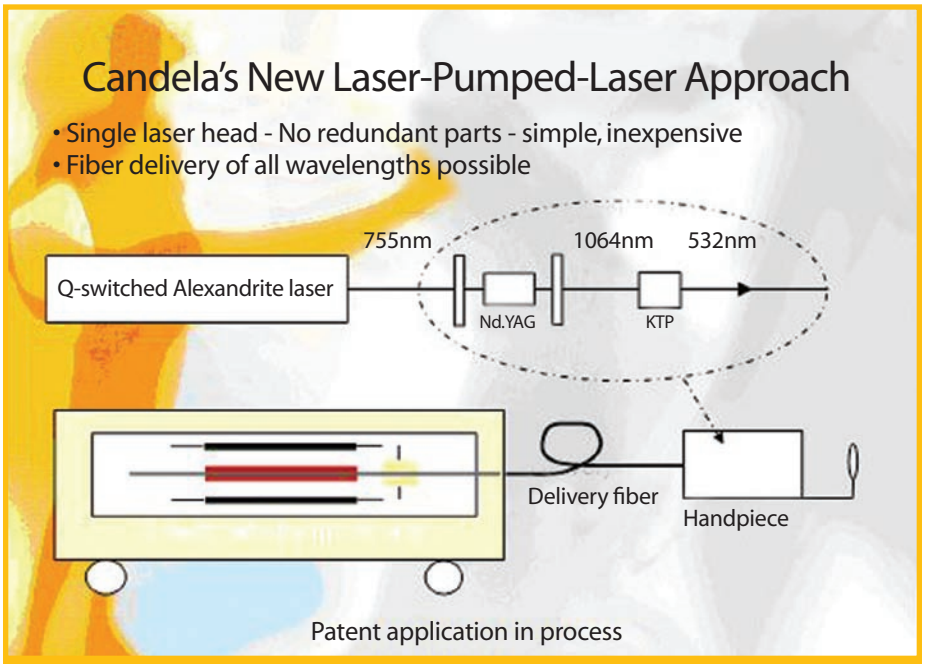

Figure 2: Candela's New Approach.

pumped with flashlamps (Figure 1) and operate at very low efficiencies of 1-3%, the laser-pumped laser scheme allows up to 70% of the 755nm laser light to be converted to 1064nm and up to 35% to be converted to 532nm. The result is a very compact, powerful, and portable source of 1064nm and 532nm which complements the 755nm output of the alexandrite laser.

The 532nm laser-pumped-laser handpiece plugs into an optical fiber that feeds it with the 755nm output of the AlexTriVantage. The pump light is focused into an Nd:YAG rod placed between the two laser mirrors located in the heart of the converter module within the handpiece. The laser rod absorbs the 755nm light and generates a 1064nm beam (Figure 2.) An appropriately cut KTP crystal within the handpiece then frequency doubles the 1064nm wavelength to 532nm. The 1064 handpiece is essentially the same except it does not require the KTP module for frequency conversion.

WHAT DOES THIS MEAN TO THE USER

While the Q-switched 755nm light from the original AlexLAZR was an industry standard for green, blue and black tattoos, there is insufficient absorption at this wavelength for removal of other colors, more specifically red tattoos. Green light (532nm) works well for removal of red tattoos. The new 532nm handpiece on the AlexTriVantage is an attachment to the existing AlexLAZR which enables the generation of green laser light (nominally 532nm) for treatment of tattoo colors not efficiently targeted by the original 755nm wavelength. The 1064nm handpiece offers a third wavelength (1064nm) that will enhance tattoo removal on darker skin types, especially with blue and black inks.

As previously mentioned, laser tattoo removal can be a lucrative addition to an established cosmetic practice. That is not to say, however, that your purchase need only offer tattoo removal capabilities. If

Before (Left) and After 7 Treatments (Right) Photos Courtesy Michael Elder, M.D.

there is one thing that I have learned in this aesthetic laser industry, versatility is the key feature when investing in a laser.

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The original AlexLAZR is not well known in the US but is well known in Asia, especially in Japan. The reason for this is the Q-switched 755 nm wavelength is highly effective for treating a wide range of epidermal lesions (such as age and sun spots, café-au-lait macules, and freckles), dermal-epidermal lesions (such as melasma and melanocytic nevi), and dermal lesions (such as Nevus of Ota and Nevus of Ito). The prevalence of dyspigmentation increases as Asian skin ages and is among the top cosmetic concerns of this ethnicity.

The Q-switched 755nm wavelength not only attacks the pigmentation via selective photothermolysis (heating) but also with the photoacoustical effect resulting from the nanosecond pulse duration. In essence, Q-switched lasers not only break up the pigment into smaller and more absorbable particles, it also causes a selected thermal injury that furthers the absorption of the excess pigment.

The new AlexTriVantage will offer spot sizes up to 5 mm in diameter and will deliver microsecond pulse durations in addition to nanosecond pulse duration to further enhance its pigmented lesion treatment capabilities. Experienced MDs prefer the Q-Switched when treating specific age spots, macules, and simple freckles because the result is faster. It is a superior way to treat a host of pigmentary conditions. Sometimes it is wiser to use a microsecond duration when treating specific pigmented lesions.

OTHER PRODUCT FEATURES

The AlexTriVantage has a unique pulse duration. At a nominal 50 nanoseconds, this pulse duration is slightly longer than other Q-switched laser devices. This longer pulse duration will be gentler to the skin by creating sufficient but less cavitation of the pigmented lesion or tattoo ink under the skin. The excess pigment is still dispersed without undue injury to the skin. In fact, the AlexTriVantage does not attempt to deliver the most energy possible for effective treatments. The experienced observer can see Candela's strategy in its product development approach. That is to deliver enough of required specifications and flexibility to treat many tattoo colors as well as many pigmentary conditions, all of this within a window that appears to be more patient friendly by reducing side-effects attributed to the traditional uses of the

Before(Left) and After Pigmented Lesions – Sun Damaged Skin (Right) Photos Courtesy Tina Alster, M.D.

Q-switched laser. It is an interesting approach.

In my humble opinion, one of the outstanding features is its lightweight optical fiber. This results in a more uniform beam profile that greatly reduces "hot spots" and pin-point bleeding that can often occur with devices that use articulated arms. The fiber optic delivery is also more natural and easier to use than the articulated arm, no matter how "articulate" it may be.

The AlexTriVantage features spot sizes from 2 to 5 mm with a 5 Hz repetition rate. Other Q-switched lasers have higher repetition rates, but how fast is fast enough? One has to be careful as well. Many tattoos have intricate detail, and pigmented lesions require specialized attention. Five shots a second seems fast enough. I am not sure if the rep rate declines with spot size. Please contact Candela for further information.

Before (Left) and After 11 Treatments (Right) Photos Courtesy Dr.James Elder.

TOUCH SCREEN INTERFACE

A new color touch screen user interface has been designed (See Figure 3), and I am sure Candela will incorporate treatment parameter information in the future.

No other Q-switch currently has stored treatment parameters and other information. I assume Candela has incorporated a memory stick pod for this purpose. This will make delegation and training much easier. The AlexTriVantage also has the redesigned distance gauges that are much better than the old ones. Finally, convenient built-in handles offer the added dimension of portability.

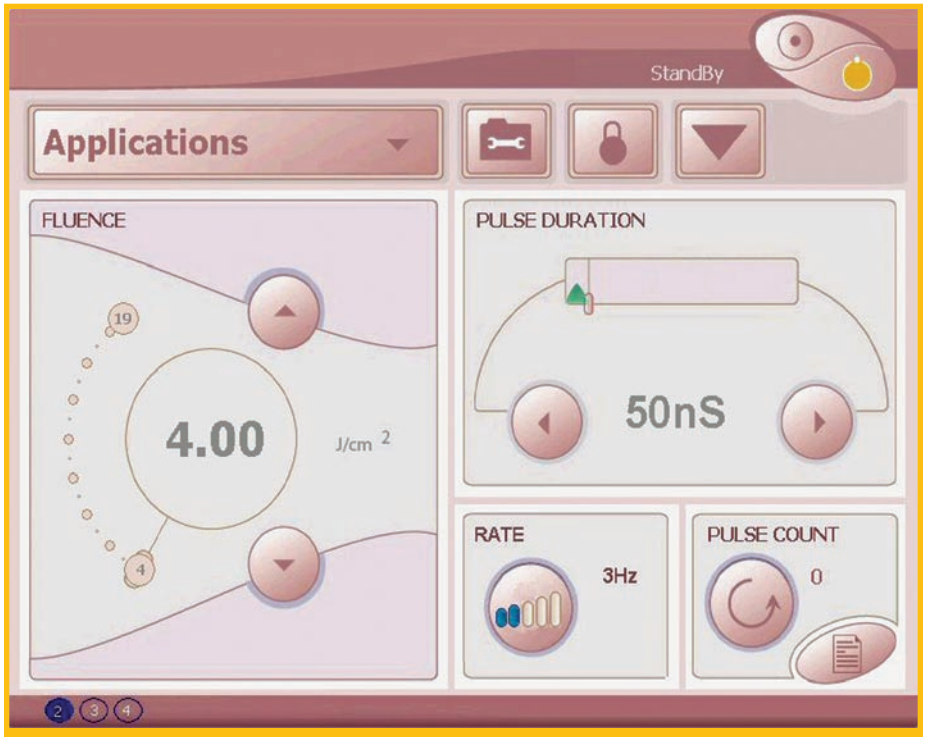

Figure 3: New User Interface with Touch Screen.

IS THIS PRODUCT RIGHT FOR MY PRACTICE?

Clearly, Candela's positioning of this product is to more fully enter the tattoo removal market while adding expanded pigmented lesion treatment capabilities. Adding a tattoo removal and advanced pigmented lesion laser to a practice's pulse dye, Nd:YAG, or even IPL treatment capabilities allows for the all important "skin rejuvenation" marketing claim. Being able to *promote* treatment of both "reds" and "browns" dyschromias with *laser quality* results makes for a fundamentally sound growth strategy.

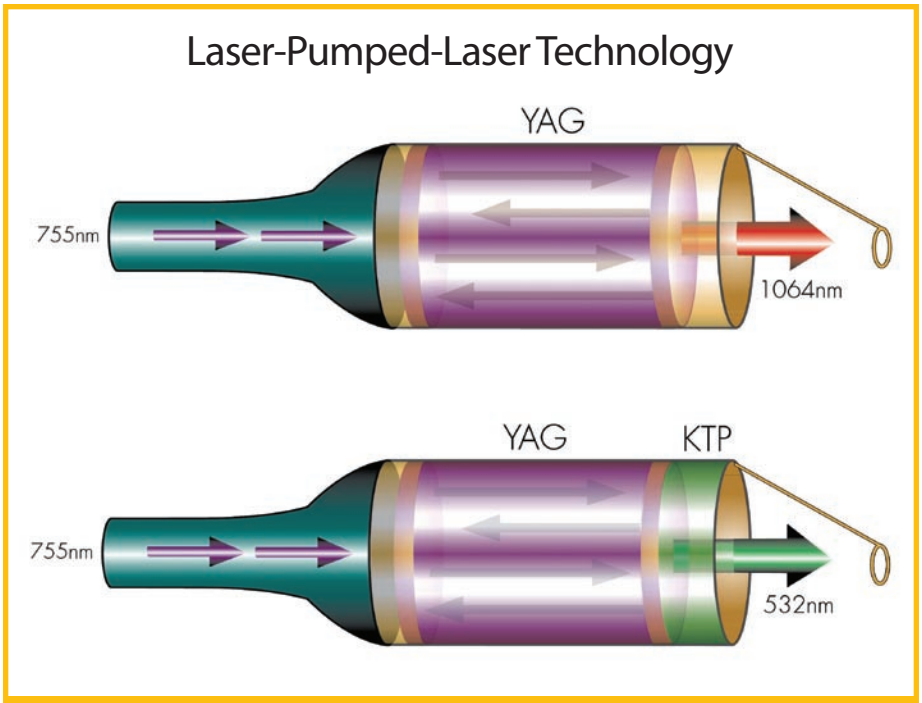

Figure 4: The 755 Q-switched laser pumps the solid-state Nd:YAG or KTP handpieces to generate q-switched 1064nm and 532nm wavelengths.

PRICING & UPGRADES

Candela will introduce its AlexTriVantage (ATV) fully loaded for $105,900 U.S. list. The new AlexLAZR will be reconfigured to improve reliability and will retail at $84,900 U.S. list.

CONCLUSION

Candela's fastest and most powerful Q-switched Alexandrite laser has gotten even better. The AlexTriVantage combines the proven performance of its 755 nm Q-switched laser with two LASER handpieces that deliver 1064 nm and 532 nm Q-switched wavelengths (See figure 4—Handpiece Concept). With this trio of wavelengths, you can count on the AlexTriVantage to effectively treat most tattoos of all colors as well as a myriad of pigmented lesions. This remarkable new configuration can also generate a 755 nm microsecond wavelength that will allow for treatment of an even greater variety of pigmented lesions.

Aesthetic Trends' Contributing Editor **David M. Cauger** is President of Boston Aesthetics, LLC, a company that specializes in the development and implementation of strategies for increased cosmetic practice success. In providing this information, Mr. Cauger is open to telephone consultations for M.D.s only between the hours of 2:00 p.m. and 5:00 p.m. Eastern Time. He can be reached at the following number: 508.460.1128 or email him at cauger1@gis.net.