

Tixel Represents New Treatment Approach for Skin Rejuvenation



Nathalie Fournier, M.D.
Center for Laser Dermatology & Phlebology
Clapiers, France



Monica Elman, M.D.
Elman Laser Clinic
Rishon Le Zion, Israel



Eric F. Bernstein, M.D.
Main Line Center for Laser Surgery
Ardmore, PA, USA



Gary P. Lask, M.D.
Clinical Professor and Director of Dermatologic Surgery
Dermatologic Laser Center, David Geffen School of Medicine – UCLA
Los Angeles, CA, USA

“One of the central advantages of the Tixel is its versatility. I can perform an aggressive treatment as with a high power fractional CO₂ laser or a very delicate treatment as with an Erbium laser.”

By Ilya Petrou, M.D., Contributing Editor

Representing a new paradigm in skin rejuvenation therapy, a revolutionary aesthetic device known as Tixel™ from Novoxel™ is aiming to take the aesthetic industry by storm. Achieving excellent cosmetic outcomes with low pain, Tixel is available at a fraction of the cost of other modalities currently available on the market.

Aesthetic devices that can generate the appropriate amount of heat in targeted tissues to initiate neocollagenesis and elastogenesis have been one of the cornerstones of successful skin rejuvenation therapy. By achieving these endpoints safely and effectively, without the need for topical anesthesia or cooling systems, the Tixel is challenging many of today’s popular aesthetic devices such as those powered by radiofrequency, laser and ultrasound.

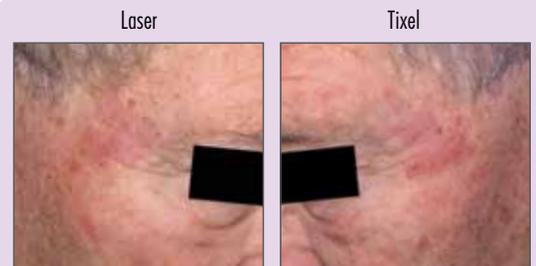
Nathalie Fournier, M.D., of the Center for Laser Dermatology & Phlebology in Clapiers, France has been using Novoxel’s Tixel system for resurfacing of moderate to severe wrinkles on the face, upper lips, crow’s feet, cheeks, glabella, forehead, perioral region and the full-face. “I have also tried it on the neck and the results are impressive. The healing time is very quick making it a great device for the face and neck,” she said.

Ever since its introduction in the aesthetic field, the CO₂ laser has been widely viewed as a go-to treatment modality for skin rejuvenation therapy, perhaps closely followed by the Erbium laser, due to the high precision and accuracy of treatment. Based on Thermo-Mechanical Ablation (TMA) technology, the Tixel impacts the targeted tissue almost identically to fractional CO₂ and Erbium lasers, but with low pain, high safety and at a fraction of the size and cost of a laser.

According to Monica Elman, M.D., of the Elman Laser Clinic in Rishon Le Zion, Israel, “One of the central advantages of the Tixel is its versatility. I can perform an aggressive treatment as with a high power fractional CO₂ laser or a very delicate treatment as with an

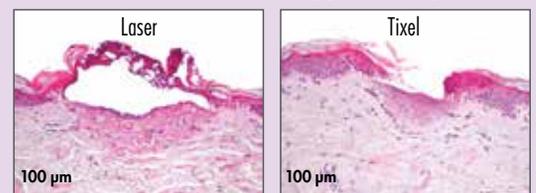


Before and three days after Tixel treatment
Photos courtesy of Monica Elman, M.D.



Patient two days after being treated with laser on left side of face and Tixel on the right side.
Photos courtesy of Monica Elman, M.D.

Comparative Histological Cross Sections of Fractional CO₂ Laser and Tixel at Typical Settings

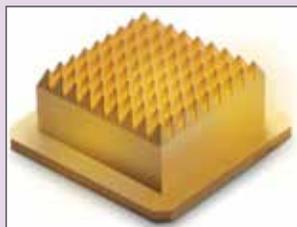


Epidermal coagulation zone:
330 µm diameter.
Papillary dermis coagulation zone:
170 µm depth.

Epidermal coagulation zone:
160 µm diameter.
Papillary dermis coagulation zone:
170 µm depth.

Photos courtesy of Nathalie Fournier, M.D.

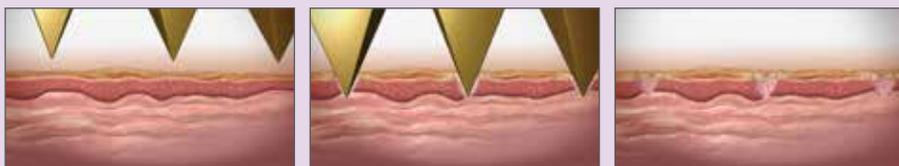
Erbium laser. For example, I have obtained nice results on the hands, which are more difficult to obtain with a CO₂ laser.”



Tixel treatment tip
Photo courtesy of Novoxel

Tixel is a non-laser fractional treatment device that can transfer thermal energy to the skin very quickly and safely. The energy is emitted through a matrix of tiny pyramid-shaped pins made of biocompatible materials covering a treatment area of 1 cm². The pins are heated to a temperature of 400° C, the same temperature generated by a CO₂ laser beam when it interacts with the skin.

During treatment, the pins are introduced to the surface of the skin at a precisely controlled speed, after which the thermal energy stored in the pins is rapidly transferred upon brief contact with the skin lasting only a few milliseconds. The ensuing evaporation of water from the skin occurs instantaneously, resulting in the formation of tiny craters in the treatment zone. The tiny pyramids hold a limited amount of energy and evaporate the upper layers of the skin in a controlled manner without causing burns or charring in the tissue – a side effect often seen with other energy-based sources.



Tissue evaporation occurs upon brief contact between Tixel treatment tip pyramids and the skin.
Photos courtesy of Novoxel

“I have used fractional CO₂ lasers over the last ten years with great success,” Dr. Elman shared. “However I am now discovering that Tixel is identical to CO₂ lasers with some substantial advantages. I have used the Tixel in full face treatments (skin rejuvenation / resurfacing) for fine wrinkle smoothing and skin texture improvement, as well as rejuvenation of the hands.”



Before and four months after two Tixel treatments
Photos courtesy of Monica Elman, M.D.

The extent of thermal damage produced by Tixel is closely related to the pulse duration, of which short, medium and long pulses can be applied. Longer pulses create a larger crater diameter and deeper thermal damage while shorter pulses create permeable channels for transdermal

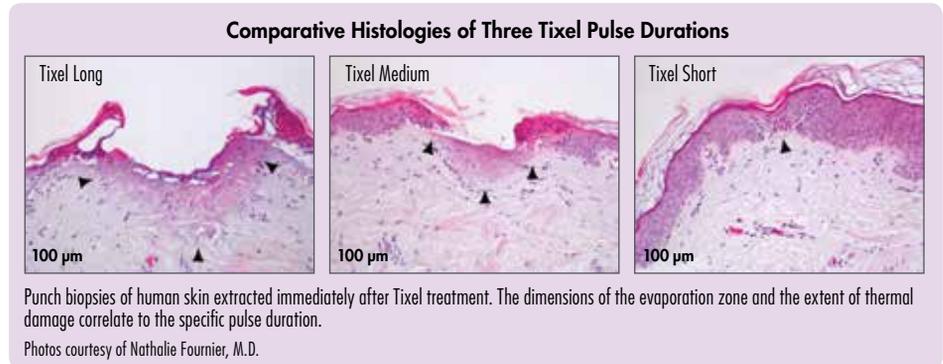
transfer. However, in contrast to thermal damage created by CO₂ lasers, histopathologic studies have shown that Tixel has extremely high control over the diameter and depth of craters, which are as deep as CO₂, but narrower.

“Tixel is a very interesting technology,” said Eric F. Bernstein, M.D., of the Main Line Center for Laser Surgery (Ardmore, Pennsylvania, U.S.). “I have been performing histopathologic studies of numerous ablative and non-ablative devices for many years, analyzing the zone of thermal damage and looking at collagen deposition. The histopathologic changes seen after Tixel treatment are very similar to carbon dioxide laser treatments, or lower settings of Erbium

“I have used fractional CO₂ lasers over the last ten years with great success. However I am now discovering that Tixel is identical to CO₂ lasers with some substantial advantages.”

“Some of the limiting factors of laser devices include their complexity, size and price; however, the Tixel is a compact and much less expensive technology, with histopathological results that are comparable to CO₂ or lower grade fractional lasers.”

lasers. I also notice a resemblance to the histopathologic changes following plasma skin resurfacing, where the stratum corneum remains intact on many specimens, and the zone of thermal damage occurs underneath. This means that a physiologic ‘dressing’ may stay in place, while the underlying dermis reorganizes with new collagen deposition.”



Very different from bulky, complex and expensive aesthetic modalities, the Tixel is a light (about 5 kg), portable, shoe box size system. The handpiece is small and light-weight, approximately 350 grams. Unlike lasers, Tixel has no optics, no high power circuits, no scanners and no water pumps. It does not radiate light or present eye safety hazards. Furthermore, ablation is smoke and particle free, and therefore does not require the use of smoke evacuators or protective dust masks. The device also achieves the right level of tissue coagulation without any bleeding.

As Gary P. Lask, M.D., a clinical professor and director of dermatologic surgery at the Dermatologic Laser Center, David Geffen School of Medicine – UCLA (Los Angeles, California, U.S.) expressed, “Fractional resurfacing has become very popular and new technologies are aimed at trying to find a better way of delivering this treatment modality. Some of the limiting factors of laser devices include their complexity, size and price; however, the Tixel is a compact and much less expensive technology, with histopathological results that are comparable to CO₂ or lower grade fractional lasers. As well, I believe there is more we can do with the Tixel to achieve even better results in wrinkles, skin tone and texture.”



As experts pointed out, Tixel’s treatment speed is as fast as any laser. Moreover, from a clinical point of view, Tixel and lasers are close to identical. Downtime with Tixel at typical treatment settings is one day and skin redness clears faster than with lasers (three days vs. five days).

In Dr. Bernstein’s opinion, “Tixel therapy will offer an alternative to ablative and mildly ablative fractionated laser treatments. Additionally, I am curious to see ‘how low’ this device can be set and still deliver clinical results. To achieve a change in the skin we only need to produce an inflammatory response, and lower settings should synergize beautifully with topical treatment modalities for a one-two punch.”