

AcuPulse™ FineTouch™: High Quality CO₂ Laser Assisted Mole Removal

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Note: The information provided in this paper supplements the existing user guide provided in the operator's manual and clinical guidelines. Do not omit the required standard pre/post-operative steps and intra-procedural safety measures.

Introduction

In Asia, and especially in Japan, laser treatment for moles (nevus, lentigo) is very common in aesthetic medicine. The device used for this treatment is usually a carbon dioxide gas laser (CO₂ laser), because to remove the nevus cells, an ablative effect is necessary for flat lesions, as well as for raised lesions. Currently, numerous models of CO₂ laser devices are commercially available, from simple full resurfacing systems to more advanced fractional systems. The actual removal of moles can be achieved even with the simpler systems, but more precisely controllable systems are superior, from the points of view of homogeneity of ablation and of minimizing excess thermal damage in the surrounding area. It is therefore preferable for systems to be equipped with precise, high-quality scanners and at the authors' medical institution 20C and 30C CO₂ laser systems (Sharplan Co., Ltd.), which are equipped with such scanners, have been used for a considerable time.

The authors recently had the opportunity to use the AcuPulse™ (by Lumenis, Ltd.), a more recently launched CO₂ laser system, and have been involved with the development of the FineTouch™ mode, focused primarily on removal of moles in Asian patients. The FineTouch™ mode is enabled by the SurgiTouch™ scanner and allows the combination of precise, homogeneous and proportionate ablative effects and appropriate thermal coagulative effects, thus better results than can be achieved with the AcuPulse™, compared to other devices.

In this report, the actual methods of use of the AcuPulse™ are presented, along with clinical case studies, and the advantages and characteristics of this system are discussed.

Methods

The Device

The FineTouch™ mode of the AcuPulse™ system (Lumenis, Ltd.) was evaluated. For mole removal, the scan size is usually 1.2 or 1.5 mm (diameter), the output power is usually 8-12 W and the setting for the Repeat mode delay is usually 0.2-0.4 sec. The following table shows the full range of parameters associated with the FineTouch™ mode:

| Scanner and Emission Mode | Treatment Mode | Treatment Mode Description | Parameter Range | |
|---------------------------|----------------|---|-------------------------|-----------------|
| SurgiTouch™ CW mode | FineTouch™ | Precise ablation of irregular pigmented lesions at various depths | Handpiece | 125mm |
| | | | Round scan size (mm) | 0.6,0.9,1.2,1.5 |
| | | | Output Power (W) | 5-40 |
| | | | Repeat Mode Delay (sec) | 0.05-1.00 |

Pre-treatment

The physician should perform a physical examination to ensure that the mole is benign.

Commonly, a local injection of xylocaine containing 1% epinephrine is used to anaesthetize the treated area, except when treatment is restricted to shallow layers of the skin, in which case it is carried out with low output power and no anaesthesia.

Treatment Procedure

Step I. The surface is treated homogeneously, with ablation carried out in such a manner that energy delivery is intermittent and avoids excessive thermal effects around the mole. Even with protruding moles, the Repeat mode is used, with a short delay setting, rather than the Continuous mode. Homogeneous vaporization is maintained at a level sufficient to achieve approximately level or slightly concave skin.

Step II. If visual examination shows residual pigment at a deep position in the skin, the scan size is adjusted to 0.6 mm, the output power is set to 12-13 W and pinpointed pigment removal is carried out.

In general, points of pigment remaining at deep positions can be confirmed visually. Moles can therefore frequently be removed if the targets are defined and deep point ablation is then carried out at multiple locations. However, even if there is a small amount of residual pigment, laser action gives rise to thermal effects in the area surrounding the mole, resulting in destruction of nevus cells in that region and it is therefore unnecessary to aim for 100% removal by ablation.

As a complementary treatment to the above, very small areas of residual pigment can be destroyed by Q-switched alexandrite laser. In addition, if residual pigment is found later, or the mole develops again, the same treatment can be repeated after 1-2 months.

There is no need to insist on completing laser treatment of moles in one session. Even if pigmentation develops again due to a small number of residual cells, treatment can be repeated once the damaged region has largely

healed. Carrying out treatment several times is considered to ultimately produce better cosmetic results than carrying out excessively deep laser ablation, which may leave visible scars.

Post Treatment

The treatment site is dressed by applying antibiotic-infused bandages, covered with thin, skin-colored paper tape. However, if a lesion 5 mm in diameter or larger is treated and the patient approves, a hydrocolloid dressing is used.

Re-epithelialization usually occurs after 7-10 days. The redness then takes several months to disappear and during that time care should be taken to avoid exposure of the treated area to ultraviolet light and to keep it moisturized.

Case Studies

Case Study 1

A 36-year-old female with a protruding nevus at the base of the left nasal ala.

Lasing was carried out in the FineTouch™ mode, with the SurgiTouch™ scanner, scan size 1.2 mm in diameter, 10 W power, with a Repeat mode delay of 0.1 sec.



Before treatment



Immediately after treatment

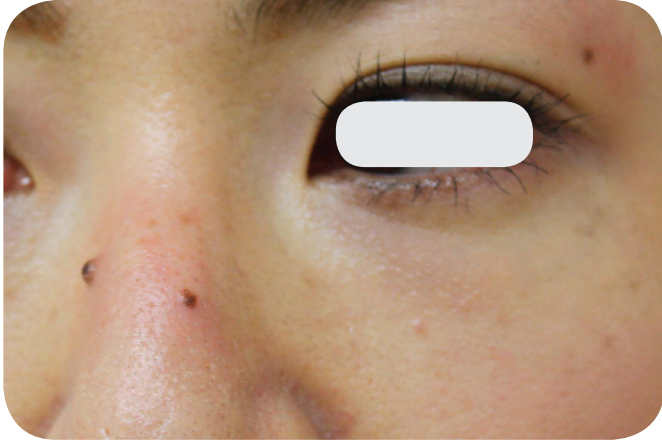


3 months after treatment

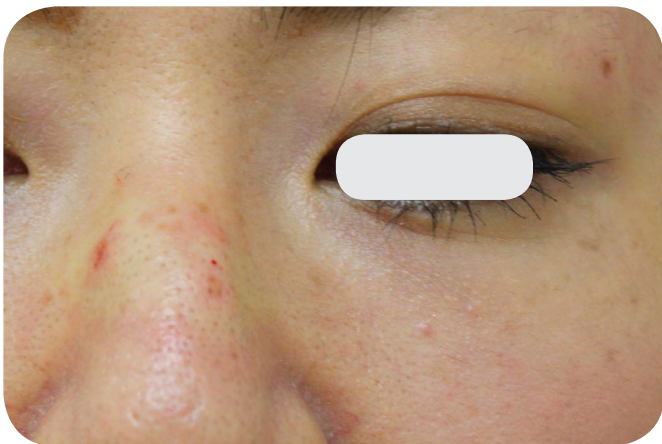
Case Study 2

A 35-year-old female with nevi on the lateral side of the left, upper eyelid and at two locations on the nasal dorsum.

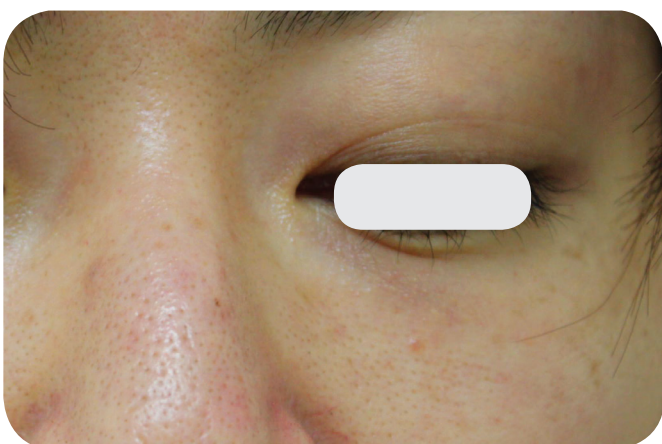
Lasing was carried out in the FineTouch™ mode, with the SurgiTouch™ scanner, scan size 1.2 mm in diameter, 8 W power, with a Repeat mode delay of 0.2 sec.



Before treatment



Immediately after treatment



5 months after treatment

Case Study 3

A 36-year-old male, with nevi at three loci, on the right cheek and the nasal ala.

Lasing was carried out in the FineTouch™ mode, with the SurgiTouch™ scanner, scan size 1.2 mm in diameter, 8 W, with a Repeat mode delay of 0.2 sec. Visual examination later showed residual pigmentation. Therefore, the treatment was repeated, with a scan size of 0.6 mm, 12 W power.



Before treatment



Immediately after treatment



3 months after treatment

Case Study 4

A 42-year-old female with nevi at five locations, on the upper lip, close to the right nasal ala and in the left nasolabial groove.

Lasing was carried out in the FineTouch™ mode, with the SurgiTouch™ scanner, scan size 1.2 mm in diameter, 8 W power, with a Repeat mode delay of 0.2 sec.



Before treatment



Immediately after treatment



3 months after treatment

Discussion

In Japan, CO₂ laser treatment for moles is in frequent use and various types of CO₂ laser equipment are used.

Mole removal usually occurs on the face, and a scar and concavity therefore should be minimized, and physicians should not compromise. However, some physicians differ in their aesthetic sense and some tend to settle and accept scarring and slight concavity as unavoidable.

There is a need for scanners that enable homogeneous vaporization, with high precision at small size scales. In particular, the deep parts of moles frequently remain as points within the dermis after treatment and neat and precise vaporization, with a diameter as small as 0.6 mm, enables the accurate and reliable targeting of these residual portions, so that treatment can be achieved effectively, while minimizing damage to healthy tissue.

In addition, using the AcuPulse™ in FineTouch™ mode with continuous wave emission, just enough heat, and subsequent thermal damage, is generated in the tissue, which is important for the treatment of moles. Attempting to remove a mole using a very short pulse width, with a lesser thermal effect on the surrounding tissue, would require the residual parts of the mole later found by visual examination to be completely vaporized and destroyed. With FineTouch™ this is not the case and any remaining nevus cells are eliminated via denaturation due to the precise thermal effect accompanying the homogeneous vaporization achieved with the SurgiTouch™ scanner at continuous wave emission. As a result, the mole is removed with minimal tissue loss.

A similar single-session treatment, performed with a simple continuous wave CO₂ laser, without the appropriate scanner and software, would result in excessive heat build-up and subsequent major damage to the surrounding tissue. With continuous wave lasing, it is therefore important to use a precise, small-scan-diameter scanner with a short-delay repeated pulse mode to avoid excessive thermal damage.

To summarize, the treatment of moles requires a delicate balance between minimizing thermal damage and having to carefully vaporize every bit of the mole. Using simple continuous wave devices greatly increases the risk of excessive thermal damage. Continuous wave emission, depending on the shape profile of the narrow-diameter scanner, can be used to achieve a pulse-type that does not result in excessive thermal effect on the tissue and is also precise enough. Thus the greatest advantage of the AcuPulse™ is that it offers a favorable balance between thermal and vaporization effects, without sacrificing precision and ease-of-use. In particular, the FineTouch™ mode allows a delay interval between consecutive pulses as low as 0.05 sec, even when using the advanced SurgiTouch™ scanner, which is an essential function for cosmetically superior treatment of moles.

Obviously, the most important criteria for techniques of this type are the maximization of mole removal and the minimization of scarring. For this reason, it seems certain that the FineTouch™ mode on the AcuPulse™ device is the ideal operation mode.