Laser Resurfacing
Full Field and Fractional

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KEYWORDS

• Laser resurfacing • Full field resurfacing • Fractional resurfacing • Hybrid fractional laser • Carbon dioxide laser • Erbium laser • Laser complications

KEY POINTS

- Full field means 100% of the treated area is removed to the selected depth.
- Fractional means discontinuous portions of the treated area are removed.
- Recovery time is linked to the amount of damage created.
- Fractional treatments usually have less downtime than full field treatments.
- Complications can arise with all of these laser treatments.

INTRODUCTION

Data from The American Society of Aesthetic Plastic Surgery[1] collected yearly from core specialists since 1997 through 2014 have shown the increase, decrease, and increase again of laser resurfacing. In 2014 more than 583,000 full field and fractional laser resurfacings were performed in core offices making this the fourth most popular procedure overall after botulinum toxins, hyaluronic acid fillers, and laser hair removal.

HISTORY

Full Field Resurfacing

The introduction of carbon dioxide lasers for skin resurfacing in the mid 1990s started the era of laser resurfacing. Lasers quickly replaced chemical peels and dermabrasion in many offices. These devices are used for full field resurfacing, which means that 100% of the target area from the epidermis down is treated (**Fig. 1**A). Continuous mode carbon dioxide lasers (10,600 nm) were initially used, but complications due to excessive depths of ablation and thermal damage led to discontinuous or pulsed systems. The water chromophore of the carbon dioxide laser allowed tissue vaporization and left behind in the tissues some resultant thermal injury. The initial discontinuous systems delivered either short pulses (Ultrapulse laser, Lumenis lasers, Yokneam, Israel) or scanned pulses (Silk-touch and Feather-touch lasers, Lumenis lasers, Yokneam, Israel). Both methods created a short exposure time to ablate tissue (approximately 75–100 μm) and limited the thermal damage (approximately 75–100 μm) that was created with the continuous systems. Spectacular results of eradicating wrinkles and tightening lax tissue were excellent in many patients, but as long-term experience was obtained there was noted to be an unacceptably high hypopigmentation rate. The pigmentary complications, scarring in some patients, and the considerable patient healing period led to the demise of full field carbon dioxide laser resurfacing around the turn of the century.[1]

Erbium:YAG lasers (2940 nm) have a higher water absorption coefficient than carbon dioxide lasers (about 10 times more efficient) and ablate tissue with much less thermal damage (5–10 μm).[2] These lasers were introduced around the end of the carbon dioxide full field era and were initially marketed for superficial resurfacing as the initial machines were low powered and it was

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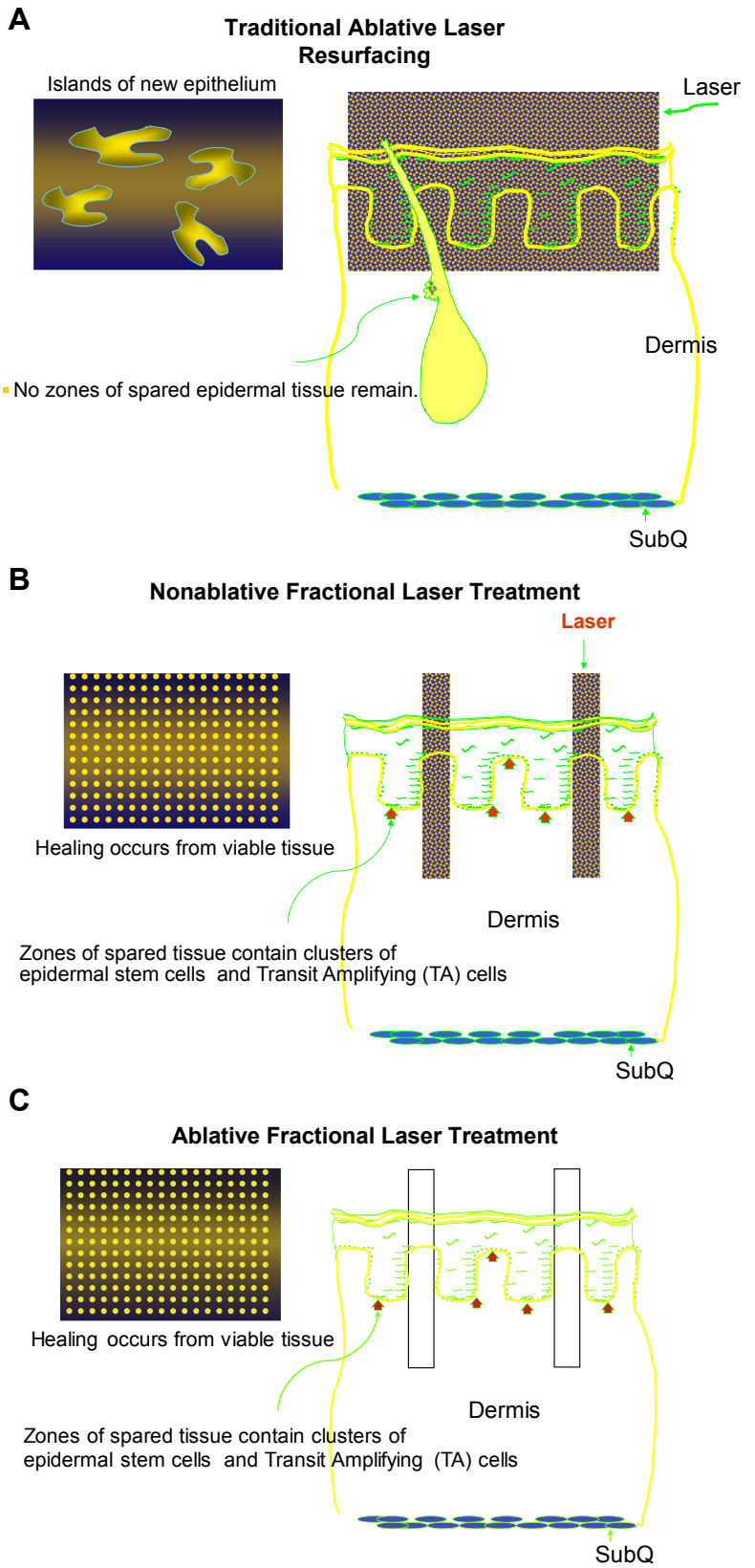

Fig. 1. (*A–C*) Full field versus nonablative and ablative fractional resurfacing. SubQ, subcutaneous.

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