

# Sequential Multilayer Tattoo Removal With Fractat Strategy

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## SUMMARY

**Background:** Efficient and complication-free tattoo removal strategies are highly requested by patients due to the large number of tattoo procedures performed worldwide. Virgin multicoloured and previously treated “resistant” tattoos might be quite challenging to “clear” using conventional laser approaches. Recently sequential multilayer laser techniques and picoseconds lasers have been proposed to “revitalize” tattoo removal procedures. QS laser systems, working within a timeframe of 4-10ns have been considered the gold standard option to remove tattoos since the 1980s and their technology has been progressively improved. Tattoo removal adopting a single pass QS laser approach requires “exhausting” numbers of sessions and extremely long time since a minimum of 2-3 month interval is to be considered between treatments. Pushing laser energy and pulse tacking to the limit has proven to be less than ideal generating consistent number of complications and side effects without improving tattoo ink removal. Ablative fractional lasers (2940nmEr:YAG and 10600nmCO<sub>2</sub>) have been used to destroy exogenous dermal pigments independently from their colour, proving particularly useful in allergic reactions to tattoo chemical components. The original R20 method consisting in 4 sequential QS laser passes spaced 20-min apart during the same procedure was quite long and cumbersome to be reproduced even if tattoo pigment clearing was increased particularly after the second pass. Third and fourth passes did not add significant advantages to justify their implementation – the fourth being the less effective. We nevertheless liked the idea of performing multiple laser passes – up to three - following a sequential energy layering protocol but without waiting the 20-min required for the QS-related sub-epidermal gas bubbles to be spontaneously absorbed. We thought to “prime” tattoos with a single 2940nm Er:YAG pass in order to obtain two results: colour-blindly destroy a fraction of dermal pigment and “drill” 250-micrometer channels for QS-induced gas bubbles to escape through. This preliminary fractional priming did not visually interfere with visual perception of tattoo design allowing operators to precisely follow tattoo colour tracks with full beam QS laser. Two or three full beam QS laser

passes were subsequently layered at 5-minute intervals. Clinical results were extremely favourable leading to 60-to-80% tattoo clearing after a single session. With the advent of fractional QS technology we thought to compare it with 2940nm Er:YAG laser fractional priming and clinical results showed to be similarly good. Presently we are using just a QS laser platform (Fotona QX Max) combining a fractional priming with 2-3 full beam passes spaced 5-min apart.

**Study:** 30 subjects, 19-42 years of age, Fitzpatrick phototype II-III, with monochromatic and polychromatic previously untreated professional tattoos underwent one full multilayer QS laser. Treatments were performed with a QS flat-beam emitting laser platform (QX Max - Fotona, Slovenia) at 1064nm Nd:YAG (5mm x 5mm fractional handpiece able to produce a perfect array of 25 MAZ – MicroAcousticZones) 4mm spot 12.7J/cm<sup>2</sup> 5Hz setting stack5 - followed by two 1064nm (3-5mm spot 6-6.8 J/cm<sup>2</sup> 4-5Hz) /532nm (3mm spot 3J/cm<sup>2</sup> 4-5Hz) full beam QS laser passes (QX Max - Fotona, Slovenia). Post-operative primary dressing was performed with Flaminal sterile alginate gel (Flen Pharma, Belgium). Standardized digital photographs were taken at baseline, 1 month and 3 months. Subjects were evaluated for tattoo clearing, and texture improvement (rating scale 1-5, 1=no effect, 5=excellent 100% clearing).

**Results:** Highly significant improvements were observed regarding pigment clearing and skin texture in all treated subjects. Mean post-op recovery time was 7-10 days. No scarring and/or infections were observed.

**Conclusion:** A multilayer sequential combination of fractional and full beam QS laser can safely and effectively reduce intradermal tattoo pigment improving skin texture as well.

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