



## Picosecond and Nanosecond Laser for Tattoo Removal

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### Introduction:

Tattoo removal is a highly sought-after procedure, given that tattooing has been gaining popularity and tattoo regret is also not uncommon nowadays. 1064 nm lasers have been shown to be the most effective for black tattoo removal in various journals. The aim of this case study is to determine whether the order of 1064 nm nanosecond and 1064 nm picosecond lasers affects the clearance speed of a tattoo.

A 23-year-old female patient with Fitzpatrick type II visited our practice for tattoo removal in the subclavian and postauricular regions. She claimed that the tattoos were made on the same day by the same artist with the same ink. The tattoos were done 3 years earlier.

Laser	Subclavian area (1st treatment)		Subclavian area (2nd treatment)		Postauricular area (1st and 2nd treatment)	
	StarWalker					
	MaQX		MaQX	PQX	PQX	
	1st Step	2nd Step	1st Step	2nd Step	1st Step	2nd Step
Laser wavelength	Nd:YAG (1064 nm)	Nd:YAG (1064 nm)	Nd:YAG (1064 nm)	Nd:YAG (1064 nm)	Nd:YAG (1064 nm)	Nd:YAG (1064 nm)
Handpiece	FS20A	R28	Black F5	Black	Black F5	Black
Mode	MaQX-1	MaQX-1	PICO	PICO	PICO	PICO
Spot size	9x9 mm	4 mm	5x5 mm	4 mm	5x5 mm	4 mm
Fluence	7 mJ/px	7 J/cm <sup>2</sup>	4-5 mJ/px	4.0 J/cm <sup>2</sup>	4-5 mJ/px	4.0 J/cm <sup>2</sup>
Frequency	2 Hz	2 Hz	2 Hz	2 Hz	2 Hz	2 Hz
Pass	1-2 passes	1-2 passes	2-3 passes	2 passes	2-3 passes	2 passes
Endpoint	Pin-point bleeding	Frosting	-	Frosting	-	Frosting
Anesthesia	Topical EMLA/Cool air					
Sessions	5 sessions with 1-month interval					



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## CLINICAL CASE:

For the subclavian area, the first step involved using 1064 nm nanosecond laser with FS20A handpiece, MaQX-1 mode, 7mJ/px, 1-2 passes were done until pin-point bleeding shown. The second step was to use 1064 nm nanosecond laser with the R28 handpiece, 4 mm spot size, fluence of 7 J/cm<sup>2</sup>. Total of 2 passes were done. The area was pre-treated with EMLA and the pain from the laser was reported tolerable. The endpoint was tattoo frosting.

The second session for the subclavian area involved using 1064 nm picosecond laser Black F5 handpiece, 4-5mJ/px, 2 passes were done until pin-point bleeding shown. The second step was to use 1064 nm picosecond laser with the Black handpiece, 4 mm spot size, fluence of 4 J/cm<sup>2</sup>. Two passes were performed. The area was pre-treated with EMLA and the pain from the laser was reported tolerable. The endpoint was tattoo frosting.

For the postauricular area, the same 1064 nm picosecond laser settings were used for both the first and second sessions. The first step is to use Black F5, 4-5mJ/px, 2-3 passes were done. The second step is to use Black 4mm, 4J/cm<sup>2</sup>, 2 passes were done. The area was pre-treated with EMLA and the pain from the laser was reported tolerable. The endpoint was tattoo frosting.

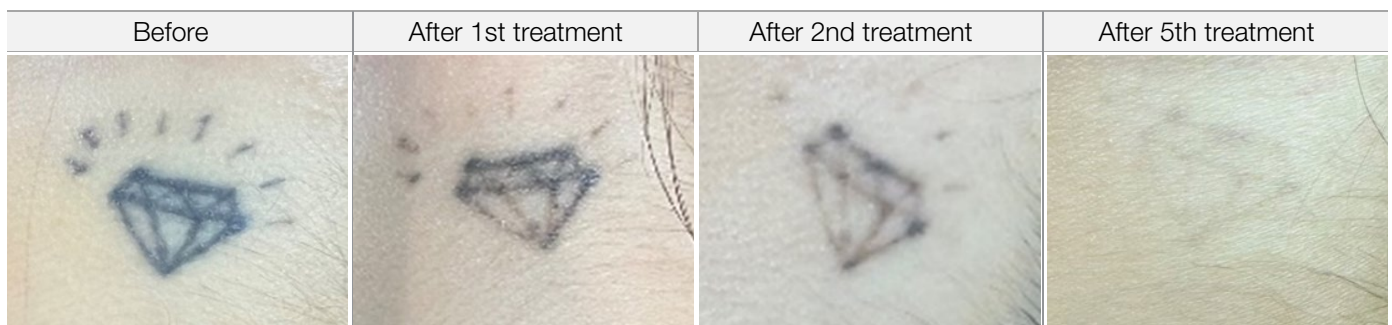
Moisturizer and sunscreen were applied to patient after treatment. Advice given to the patient was to avoid long periods of / extreme sun exposure.

As shown in the pictures, the laser treatments were done with 1-month-interval and total of 5 sessions. No complications were observed. As for efficacy, both tattoos required lesser sessions than the estimation by Kirby Desai scale, indicating that both laser systems are effective in clearing tattoos.

As for safety, there was a difference in downtime between the nanosecond and picosecond lasers reported by the patient. She claimed that there was little to no downtime after the picosecond laser, while on the other hand, after the nanosecond laser treatment there was a week of recovery time, which included redness, swelling and scabbing, all of which resolved spontaneously. There are no long-term side effects noted.

Both photothermal and photoacoustic effect are important mechanism in tattoo removal. Cases here demonstrated that both StarWalker MaQX and PQX are effective in tattoo removal and are performing better than estimation.

The picosecond laser has gained popularity due to its better clearance of pigment or tattoo ink with reduced side effects, as shown here in this case.



Kirby Desai scale for both tattoos

	Skin type	Body part	Ink	Layer	Scar	Color	Total
Subclavian	3	2	2	0	0	1	8
Postauricular	3	1	2	0	0	1	7

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