# Treatment of Melasma with Multi-Pulse Nd:YAG Laser

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Introduction:

Melasma is a chronic pigment disorder with multiple triggering factors, such as sun exposure, hormones, pregnancy and genetics. Management of melasma remains challenging. Traditionally, it has been treated with a combination of photoprotection, control of triggers, microneedling, chemical peeling and topical depigmenting agents (such as hydroquinone) with varying degrees of success and side effects. Recently, new pathways involved in pigment production and melasma pathophysiology are being studied, which enables a better use of technologies. Previous studies demonstrated successful results using very-short-pulse lasers. In this report, we aim to present an efficient and safe treatment of melasma with a multi-pulse Nd:YAG approach.

| Laser | StarWalker | | |
|---|---|---|---|
| | **Step 1** | **Step 2** | **Step 3** |
| Pulse mode | Q-switched MaQX-1 | FRAC3 0.6 ms | Fractional Q-switched MAQX-1 |
| Handpiece | R28 | R28 | FS20A |
| Fluence | 1.8-2.2 J/cm² | 14 J/cm² | 7-9 mJ/px |
| Frequency (Hz) | 10 | 4 | 5 |
| Spot size | 7 mm | 4 mm | 9x9x9 |
| Passes | 10 | 6 | 1 |
| Cooling | yes | yes | yes |
| Sessions | 3-4 sessions every 4 weeks | | |

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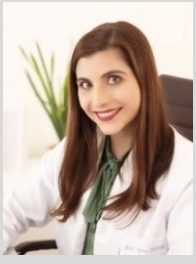

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## CLINICAL CASES:

Four patients aged 42, 40, 39 and 37 (figure 1, 2, 3 and 4, respectively), with bilateral facial melasma despite long-term use of topical therapies, were submitted to 3 sessions of laser treatment.

The treatment consisted of 3 steps, performed with Nd:YAG Laser (StarWalker; Fotona), following a sequence of parameters (table 1). Topical anesthetic cream (lidocaine 23%, tetracaine 7%) was applied to the face 30 min before the procedure and cooling was used for better patient comfort.

In the first step, we applied Q-switched (QS) Nd:YAG with MaQX-1, which is able to destroy melanosomes and to fragment melanin by its photoacoustic effect. Usually 10 passes are adequate, mainly concentrated in the melasma area. The fluence can be adjusted according to the pigmentation intensity, as higher fluences are used for lighter melasma.

The second step requires the use of FRAC3 pulses to reduce inflammatory mediators and the vascular components of melasma. Five to ten passes are performed in the melasma area and are very well tolerated.

In the third step, we select a fractional QS handpiece (FracTAT) to produce a non-thermal rejuvenation of the tissue by promoting skin turnover. One pass is applied on the full face, starting on the front, which has a thicker skin, using 8.0 to 9.0 mJ/px. Depending on the patient and area, we can reduce the fluence to 7-8 mJ/px and perform 2-3 extra passes on the affected areas.

After the treatment, the patient is advised to avoid sun exposure and start use of sunscreen the day after. We usually prescribe a moisture cream daily for a week. It is expected to see erythema and mild edema, with some small crusts, in the first 2-3 days. At least 3 sessions in a 4-week interval are required to achieve good results.

CASE 1

CASE 2

CASE 3

CASE 4