

Podiatry Case Report

Case No 1401



Treatment of Onychomycosis Using a Hand Held 1064nm neoV Laser.

Onychomycosis is a chronic fungal nail infection that affects a significant portion of the population and can have serious consequences to the elderly, diabetics, and immunocompromised individuals.

Current treatment options for Onychomycosis include a wide array of potential therapies including nail excision, chemical or surgical avulsion, topical treatments, oral treatments as well as device based approaches. Treatment approaches may combine one or more of these regimes. Topical drug treatment for onychomycosis is not usually successful because of problems to penetrate the nail plate and rapid recurrence can occur after discontinuing use. Oral systemic interventions may be more effective yet may present side effects, such as liver related toxicity, loss of taste, and potential interactions with other drugs, thus limiting its use. Contraindications prohibit the medication in numerous cases.

In recent years, the use of lasers, and specifically the 1064 Nd:YAG laser for the treatment of Onychomycosis has been suggested and reviewed in literature with promising results. During 2014 our clinic has treated multiple patients for onychomycosis with a new 1064nm laser (neoV1064-10, neoLaser, Caesarea, ISRAEL, Fig A) with good results. Here we present a specific case report of a 53 year old male patient, treated for bilateral onychomycosis with involvement of both great toes (Fig E1, E2). It is our preference to treat patients with a combined treatment approach involving 2 or 3 modalities to increase probability of success. In this specific case, a combination of laser and topical treatment was utilized to achieve a significant improvement in nail clearance.



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PATIENT PROFILE

53 year old male patient with onychomycosis. Bilateral disease involving both great toes. Culture from nail tested positive for Trichophyton Rubrum..

TREATMENT RESULTS

4 laser treatments over 2 months with addition of topical agent and anti-fungal powder. Clearance of fungal infection in both nails evident during follow up, 4 months after last treatment (Fig F1, F2)

TREATMENT COURSE

The patient, a 53 year old male, presented with bilateral disease of onychomycosis of both great toes (Fig E1, E2). Presence of onychomycosis fungal infection was verified to be Trichophyton rubrum. The patient was assigned treatment involving laser, anti-fungal cream, and anti-fungal powder. The laser used was the neoV1064-10 laser system, which delivers energy at 1064nm, using a semiconductor diode source, with output power up to 10Watts.

The nail was debrided to improve energy transmission into the nail plate (Fig B). The laser was set to 10Watts peak power, 20msec pulse on time, 10msec pulse off time, resulting in a repeat pulse transmission at 33.3Hz and effective average power of 6.7Watts to the nail (see Fig C). Energy was delivered to the patient through a dual connector 400 micron, silica/silica fiber with NA 0.22, proximally connected to the laser and distally connected to a treatment focusing hand piece (see Fig D).

The focusing hand piece, utilizing distance setting metal prongs, provides a 1mm spot size at the focal plane, providing power density of 25.5J/cm2 to the nail at the settings provided above.

In each treatment session the beam is scanned in constant motion across the nail until the patient declares he has reached his pain tolerance limit. This procedure is repeated between 3-6 times per nail, depending on how long the patient may tolerate each pass. The entire nail area is irradiated as well as the surrounding border of the nail.

The patient went through 4 laser treatments over the course of 2 months, per the settings above. Between consecutive treatments, the patient was instructed to use topical cream (Cremolan Nail, Gebro Pharma, Switzerland), as well as anti-fungal powder inside the shoes.

Images of fungal involvement of the nails were documented before the first treatment and 4 months after the last laser session, to allow nail growth showing healthy growth of a clear nail (Fig F1, F2).



Figure A: neoV1064 Laser System by neoLaser



Figure B: Nail Fungus Continuous Scan Mode Settings



Figure C: Nail Fungus Focusing Hand Piece



Figure D: Nail Debridement Prior to Laser Treatment



Figure E1: Right great toe before treatment



Figure E2: Left great toe before treatment



Figure F1: Right great toe after treatment



Figure F2: Left great toe after treatment

DISCUSSION

Onychomycosis presents a chronic and difficult disease for eradication. Given the limitations of existing treatment regimes, the laser adds an important, safe and effective option to the armamentarium of treatment options in our clinic. Having no side effects, the

laser enables a simple, nontoxic and effective treatment. As a result, the neoV1064 system is an important addition to our clinic for ongoing treatment of onychomycosis patients.