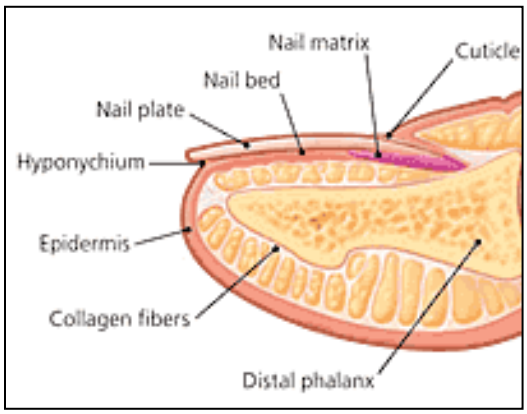
Complete Restoration of a Toenail Compromised by Onychomycosis, Using a Novel 0.65 millisecond Pulsed Nd:YAG 1064nm Laser

Boris Raginsky, DPM, Toenail Laser Centers of New Jersey, Fair Lawn, NJ

Background and Objective:
A male patient aged 74 presented with a toenail on the left foot that was affected by Onychomycosis and fully compromised. Laser therapy was selected because previous treatments by other modalities were not effective.

Materials and Methods:
The 1064nm laser modality has been proven to be effective in clearing Onychomycosis, as long as the pulse duration is in the submillisecond range and the fluence is at least 40-50 joules per square centimeter. Such a submillisecond Nd:YAG laser (the LightPod Forte laser from Aerolase, Tarrytown, NY) was used to treat this patient. The nail bed was cleaned and dried, and laser energy was applied at a spot size of 5mm, fluence of 41 j/cm^2 and 0.6 millisecond pulse duration, with two complete passes applied to the full nail bed including the nail matrix area and surrounding skin. Two treatments were performed, spaced three months apart.



One of the key aspects of eradicating Onychomycosis is to achieve penetration of the laser energy into the nail matrix, which can be 2mm deep beneath the nail. This area needs significant heating to ensure the fungal material is destroyed, thus requiring a deep-heating and powerful laser. The submillisecond Nd:YAG 1064nm laser is ideal as it is well established in the field of laser medicine as being a much deeper penetrating modality than diode lasers, or Q-switched Nd:YAG lasers which energy is absorbed superficially on the surface of the skin and can not travel deep into skin tissue.

Results:
A new, healthy and clear toenail grew in within 6 months after the first treatment session. No side effects were observed.

Before First Tx (Dec. 23, 2011)

3 Months after 2nd Tx (June 1, 2012)