

# Infrared Laser Light Efficacy in the Treatment of Maxillofacial Hemangiomas and Vascular Malformations

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## SUMMARY

Hemangiomas and vascular malformations are a frequent oral and maxillo-facial pathology found in young and old patients who come to our department for medical examination and treatment. A large proportion of these vascular anomalies affect these patients aesthetically and functionally as well as present risks that limit classical surgery.

The aim of our retrospective study was to evaluate the efficacy of infrared laser light in the treatment of maxillofacial hemangiomas and vascular malformations that are located on the oral and maxillofacial areas, using pre- and post-operative Color Doppler Ultrasonography for evaluation of the results.

In our department we have over 15 years of experience in the laser treatment of hemangiomas and vascular malformations localized in the oral and maxillofacial area. All vascular anomalies treated were located on regions with high aesthetic and functional significance for the patient. We use Color Doppler Ultrasonography for diagnostic accuracy. Patients treated in our department (more than 250 patients) received one of the methods of treatment for vascular anomalies, such as hemangiomas and vascular malformations, contact or interstitial laser therapy by photothermal coagulation.

For the treatment of these vascular anomalies we used a 980 nm or 810 nm diode laser (XPulse Line, Fotona, Slovenia) and 1064 nm Nd:YAG laser (LightWalker, Fotona, Slovenia). The diode lasers and Nd:YAG laser have a high absorption in hemoglobin and melanin, so they are well absorbed in vascular tissue. Diode laser parameters used during the procedure were: continuous mode (CW) at a power between 6 W to 8 W, and the energy sent to the tissue was an average of 1000 J per unit area (cm<sup>2</sup>). For the

Nd:YAG laser the parameters used were: SP mode, power of 5 W, 50 to 100 Hz, energy fluence 1000 J/cm<sup>2</sup>, 300-micrometer laser fiber, through the glass plate and with ice cube cooling. We repeated this protocol every 6 weeks until we obtained a good result.

After the laser therapy we achieved a reduction in the size of hemangiomas and vascular malformations in all patients who were treated with such a procedure, and the aesthetic results were favorable. The surface regression of the lesions and the reduction of vascular signal as measured by Color Doppler Ultrasonography varied between 65% and 95%. No reperfusion or recanalization of laser-treated vascular anomalies was observed after an average follow-up of 1 to 7 years.

The infrared laser light (810 nm, 980 nm or 1064 nm) has been proven to be effective in the treatment of hemangiomas and vascular malformations in the oral and maxillofacial area. Laser therapy by photothermal coagulation in the treatment of vascular anomalies was more effective than other procedures.

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