



The Potential Benefit of PBM in the Treatment of a Late Post-operative Complication Subsequent to Open Reduction with Internal Fixation of Ankle Fractures

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Introduction:

Pain is the most frequent reason for consulting a physician in North America. The most common reason for missing school or work is musculoskeletal pain. Presently the most common treatments include NSAID medications, possible steroid therapy, opioids and surgery. These therapeutic modalities each carry different risks with potential limited benefit. The ideal treatment for musculoskeletal pain would need to be effective and carry low risk.

Laser	Fotona LightWalker ATS		
	Broad Biomodulation	Targeted Biomodulation	Broad Biomodulation
Wavelength	Nd:YAG 1064 nm	Nd:YAG 1064 nm	Nd:YAG 1064 nm
Handpiece	Genova	Genova	Genova
Spot size	1 cm ²	1 cm ²	1 cm ²
Power / Power density	0.5 W/cm ²	0.5 W/cm ²	0.5 W/cm ²
Mode/Pulse	MSP	MSP	MSP
Frequency	10 Hz	10 Hz	10 Hz
Passes/Repeats	2x60 s quick broad coverage of lower leg	60 seconds targeted over the fixture sites (two specific areas)	2x60 s quick broad coverage of lower leg
Sessions	1 session of all steps every other day for 10 days		



Dr. Douglas Hanson attended Laurentian University from 1985-1988, completing his BSc, and subsequently attended the University of Toronto Faculty of Dentistry with his DDS degree in 1992. He began his professional practice in June of 1992. Dr. Hanson completed his fellowship at the Las Vegas Institute for advanced dentistry in 2014. In 2019 he received his second fellowship in the International Association of Physiologic Aesthetics. He is a clinical instructor and part time lecturer at the Las Vegas Institute. He is also the Canadian chapter President of the international Association of Physiologic Aesthetics. In 2021 he completed the didactic component of LAHA's Mastership in laser dentistry.

CLINICAL CASE:

The patient is a 55 year old, healthy, Caucasian male who sustained a Bimalleolar fracture of his right ankle in March of 2007. Immediate open reduction and internal fixation was completed within 4 hours of the traumatic injury. Initial healing, recovery and rehabilitation were unremarkable. The patient had quickly returned to normal life and did not experience problems for 14 years post surgery. In February of 2021, mild spontaneous swelling and moderate pain set in, 600 mg of ibuprofen was taken for several days and the symptoms resolved. The pain reappeared in July of 2021 and was significantly more severe, in fact, various NSAIDS were tried with very little success. Diagnostic investigation and possible therapeutics were considered and the decision to try Low Level Laser Therapy, also known as Photobiomodulation, was made.

The treatment proposed included fixture removal, which included significant potential morbidity along with a limited prognosis of resolution. The second alternative proposed involved control of symptoms with pharmacological agents. Laser Photobiomodulation was proposed and the decision to attempt this was based on limited down side along with potential positive outcome. The time and cost were not factors as the patient had easy access to the laser technology and service required. The treatment involved a protocol of every other day for a total of five sessions. Each session involved 6 minutes of active Photobiomodulation broken down as follows; 2 minutes of broad coverage of the lower leg and ankle as shown in the photo series, this was immediately followed by two 60 second applications directly over the two fixture sites that represented the focal point of the acute pain. To complete each session, a second two minute broad application of energy was performed covering the lower portion of the leg and ankle again. The patient experienced some immediate relief with each session. The sessions were repeated five times over a ten-day period. The patient reported almost complete resolution of the symptoms subsequent to the third session. Sessions four and five were completed and the patient has remained pain-free at the 4-week follow up.

The literature supporting the benefits of Photobiomodulation is extensive. This application provided almost immediate relief and has allowed the return to previous activities without the need for ongoing treatment or pharmacological agents.

The simplicity, the minimal potential morbidity as well the extensive support in the literature touting the benefits of photobiomodulation make this application a very good option for treating these types of problems.



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