Healing Of High-Grade Shoulder Supraspinatus Tendon Injury By Low Level Laser Therapy (LLLT)

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Citation

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Abstract

Introduction

This clinical case series revealed sucessful healing of high-grade shoulder supraspinatus tendon tear by low-level laser therapy(LLLT) administered for 24 weeks 3 times per week, healing of tendon was confirmed by serial MRI examinations

Materials & Methos

This prospective clinical case series consisted of 3 patients average age 39 with high-grade supraspinatus tendon injury of the shoulder being the sole injury, who refused operation. LLLT was administered by GaAIA semi-coductor laser and serial MRI was used to assess the degree of healing if any. Serial VAS pain scale was used to monitor pain level

Results

All 3 subjects had complete healing of the high-grade supraspinatus tendon tear at the 24 week mark. All subjects had complete resolution of pain. All were satisfied with this non-invasive treatment of tendon injury

Conclusion

LLLT if administered properly can aid in actual healing of tendon tear and not just providing adequate pain relief

INTRODUCTION

It was shown by previous clinical studies (1) that LLLT that can have positive effects in all 3 phases of tendon healing, and the author has previously shown LLLT is effective in treating Achilles Tendon Tendinitis (2) but the question remains whether LLLT can be helpful in high grade tendon tear as well which form the basis of the current study.

MATERIALS AND METHODS

This represents a prospective unselected cohort case series of 3 patients spanning 2018 to 2022 suffering from high-grade shoulder supraspinatus tendon injury confirmed by MRI who refused operation and treated solely by low-level laser therapy LLLT. The mode of administration of LLLT is same as the other published papers by the author. LLLT of 810 mm wavelength emitting from GaAIAs semiconductor laser device with 5.4 J per point, power density 20 mW/cm2 was employed. The treatment regime consisted of three sessions per week for 24 consecutive weeks. Each treatment session lasted 180 seconds, administered by scanning mode. MRI was repeated for each subject to assess the status of the tendon healing if any. Figure 1 shows the MRI of one patient at initial presentation, Figure 2 shows the MRI of the same shoulder upon completion of therapy, the MRI report shows healing of the supraspinatus tendon as well as marked decrease in the inflammatory process. We also monitor serially the level of pain by VAS pain scale and note the degree of satisfaction of the subjects to this non-invasive therapy.

Figure 1

MRI before therapy

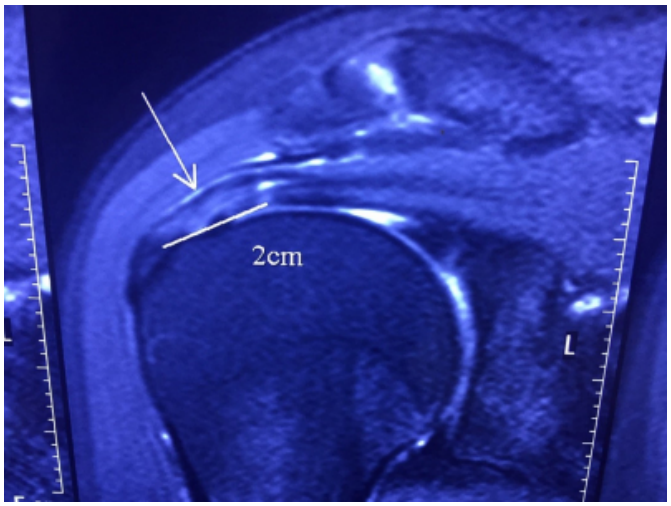
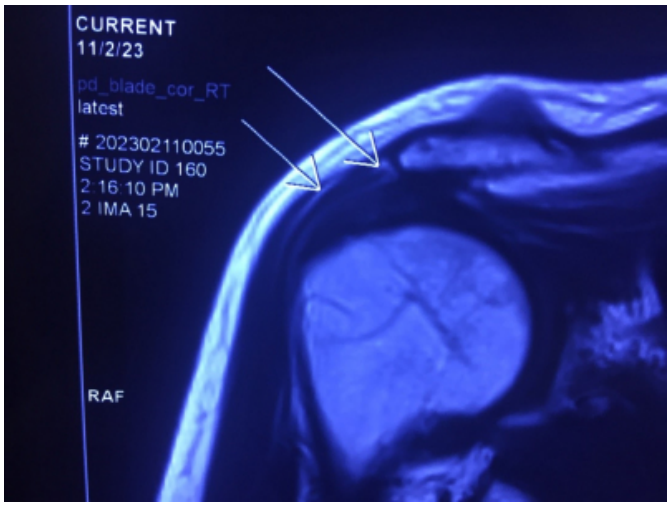


Figure 2

MRI after therapy



RESULTS

The average age of the 3 subjects was 39 (range 33 to 43) and all were females. The average VAS was 8/10 at presentation, the average VAS was 1/10 upon completion of therapy All 3 subjects had complete healing of the high-grade supraspinatus tendon tear upon completion of the study. All subjects were completely satisfied with this non-invasive method of tendon healing. All subjects were followed up for 12 months, and all subjects were satisfied with the clinical result with pain resolution, as well as satisfactory tendon healing.

DISCUSSION

Traditionally patients with high grade supraspinatus tears who refused surgery are being given non-steroidal anti-inflammatory medication, and standard physiotherapy like ultrasound, electrical stimulation therapy, or even other modalities like platelet rich plasma, but none of these regimens have confirmed complete healing or near complete healing of the tendon after treatment. This represents the first ever study to proof by serial MRI examination that LLLT can be employed to promote the healing of these highly injured tendons. LLLT has been shown to have anti-inflammatory effects (3) as well as improvement in micro-circulation (4) as well as up- regulation of several genes involved in energy metabolism and oxidative phosphorylation thus stimulating an increase in ATP production, which in turn regulates other cellular processes leading to normalization of biological functions at the cellular level (5). This is in sharp contrast to traditional physiotherapy methods like ultrasound that do not possess bio-modulation effects (6)

CONCLUSION

Based on the very positive clinical result of the current prospective case study, LLLT can be considered as a viable non-invasive treatment method to aid in the healing of high grade supraspinatus tendon injury in that LLLT not only reduces the level of pain, but actually can heal the injured tendon as well.

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