

The Efficacy of Class IV Laser Treatment for Epicondylitis: A Randomized Controlled Trial



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Abstract

Low level lasers (LLLT) have been shown to decrease PGE₂ levels (Bjordal et al, 2006), increase nitric oxide synthase activity (Samoilova et al 2008) and collagen turnover (Lopes-Martins et al, 2007). Previous studies have used class IIIb lasers with power outputs of less than 0.5W; here we evaluate a dual wavelength (980/810 nm) class IV laser with a power output of 10W. **PURPOSE:** To determine the efficacy of class IV laser therapy to alleviate the pain and dysfunction associated with chronic epicondylitis. **METHODS:** Fifteen subjects volunteered for a double blind randomized study using laser therapy (LT) (LiteCure LCT 1000), or an identical sham. Subjects underwent clinical examination (pain, range of motion, strength and ultrasonic imaging) to confirm chronic tendinosis of the extensor carpi radialis brevis tendon followed by eight treatments of 10 J/cm² over 18 days. The exam was repeated at 0, 3, 6 and 12 months post-treatment. **RESULTS:** No differences were seen between the two groups prior to treatment. In the year following treatment pain and strength measures consistently improved significantly in the LT group but not in the Sham group.

Table 1. Post-LT pain and strength scores. Mean±SD

Handgrip (kg)		Initial	Post-treat	3 mo-post	6 mo-post	12 mo-post
	Sham	29±9	26±10	28±11	29±11	
	LLLT	27±11	28±11	32±13	41±11	41±10
Functional impairment (1-5, 5 = useless)						
	Sham	2.3±1	2.3±1	1.9±1	2.2±1	
	LLLT	3.0±1	2.1±1	1.6±0.5	1.0±1	0.7±0.5
Pain Handgrip (VAS 1-10)						
	Sham	4.3±3	4.0±3	2.3±3	2.7±2	
	LLLT	4.4±2	3.6±2	1.3±1	0.9±1	0.8±1
Pain Lateral Palpation (VAS 1-10)						
	Sham	5.1±2	3.4±3	3.3±3	4.1±2.5	
	LLLT	5.8±2	4.5±2	3.1±2	1.4±1.5	0.9±1
Pain Extension Middle Finger (VAS 1-10)						
	Sham	5.3±1	4.4±1	3.7±2	3.4±2	
	LLLT	5.3±2	3.8±2	2.6±1	0.4±1	0.1±0.1

CONCLUSION: These findings suggest that LT is efficacious for the long term relief of the symptoms associated with chronic epicondylitis. The potential for a fast, safe and effective treatment warrants further investigation.

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Introduction

When administered correctly the cellular and clinical evidence for the effectiveness of LLLT in the promotion of tissue healing is strong (Pires et al 2011, Tumilty et al 2010). However, until recently these treatments were limited by the low power of the class IIIb lasers (0.5 W) and the long exposure required to achieve an effective dose (45 min). Here we report on the effects of a dose of 10 J/cm² administered directly to the extensor carpi radialis brevis tendon and surrounding area in only minutes, using a powerful new class IV Laser (10W), on chronic lateral epicondylitis one year following treatment.

Results

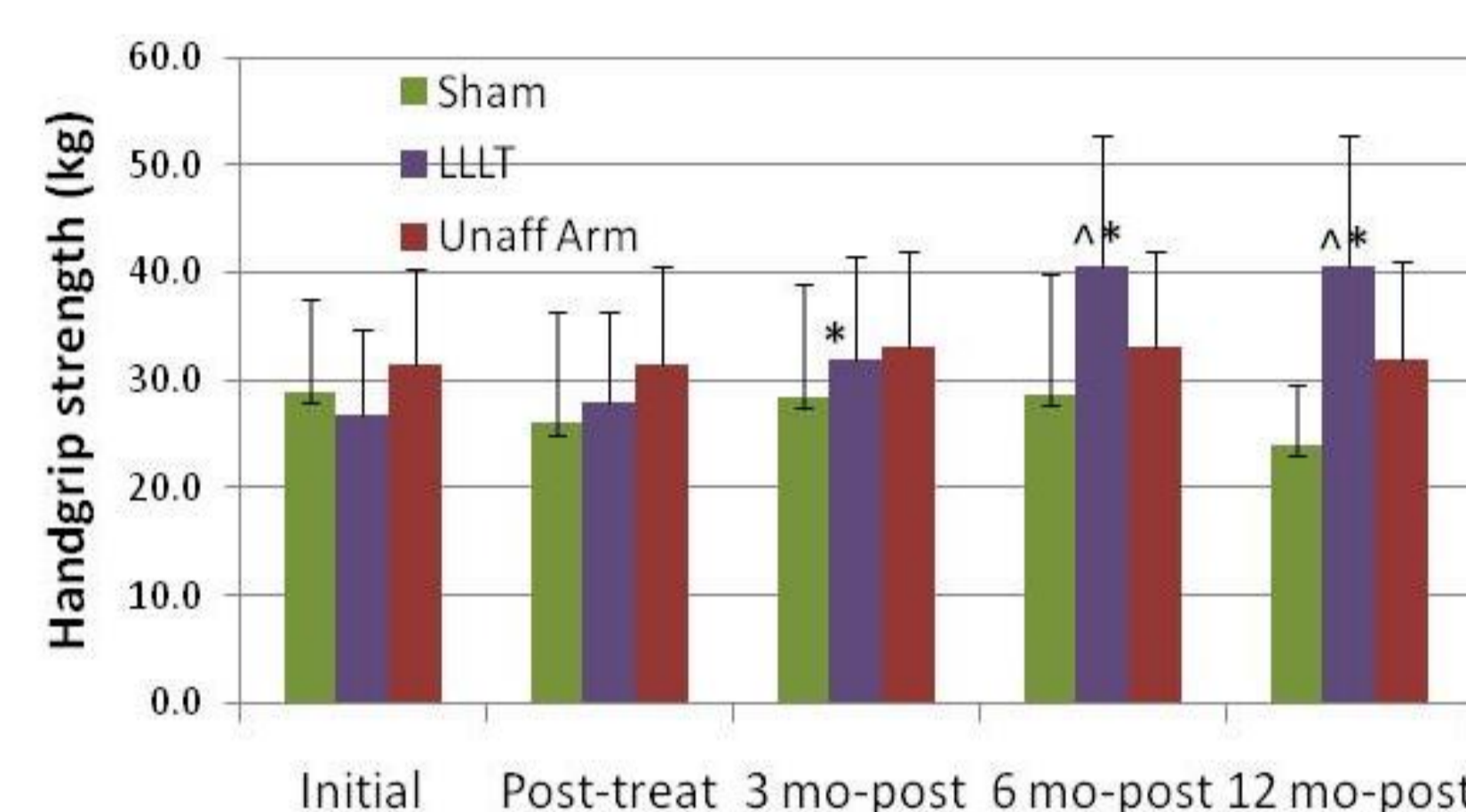


Figure 1. Handgrip strength
*Significantly different from pre-treatment
^Significantly different from sham group.
p<0.05

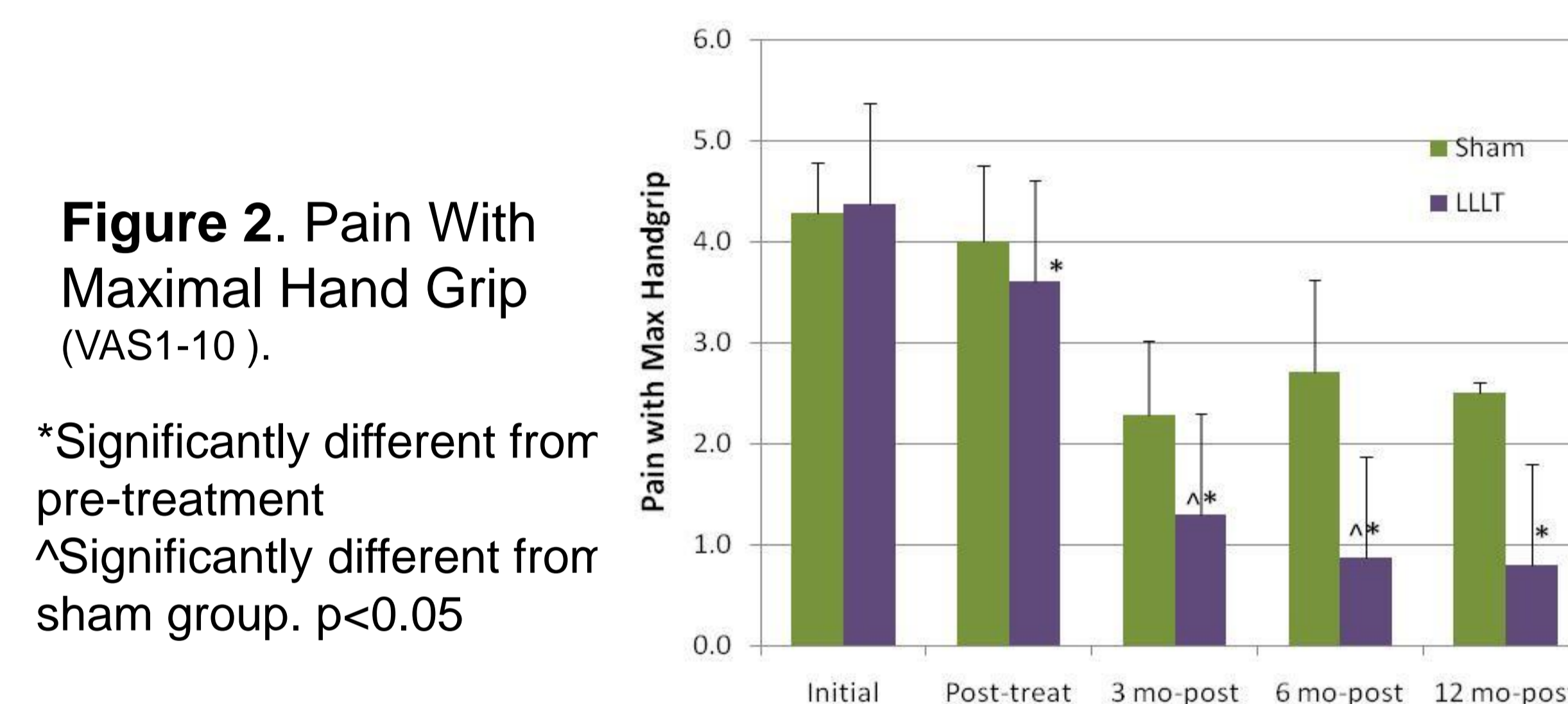


Figure 2. Pain With Maximal Hand Grip (VAS1-10).
*Significantly different from pre-treatment
^Significantly different from sham group. p<0.05

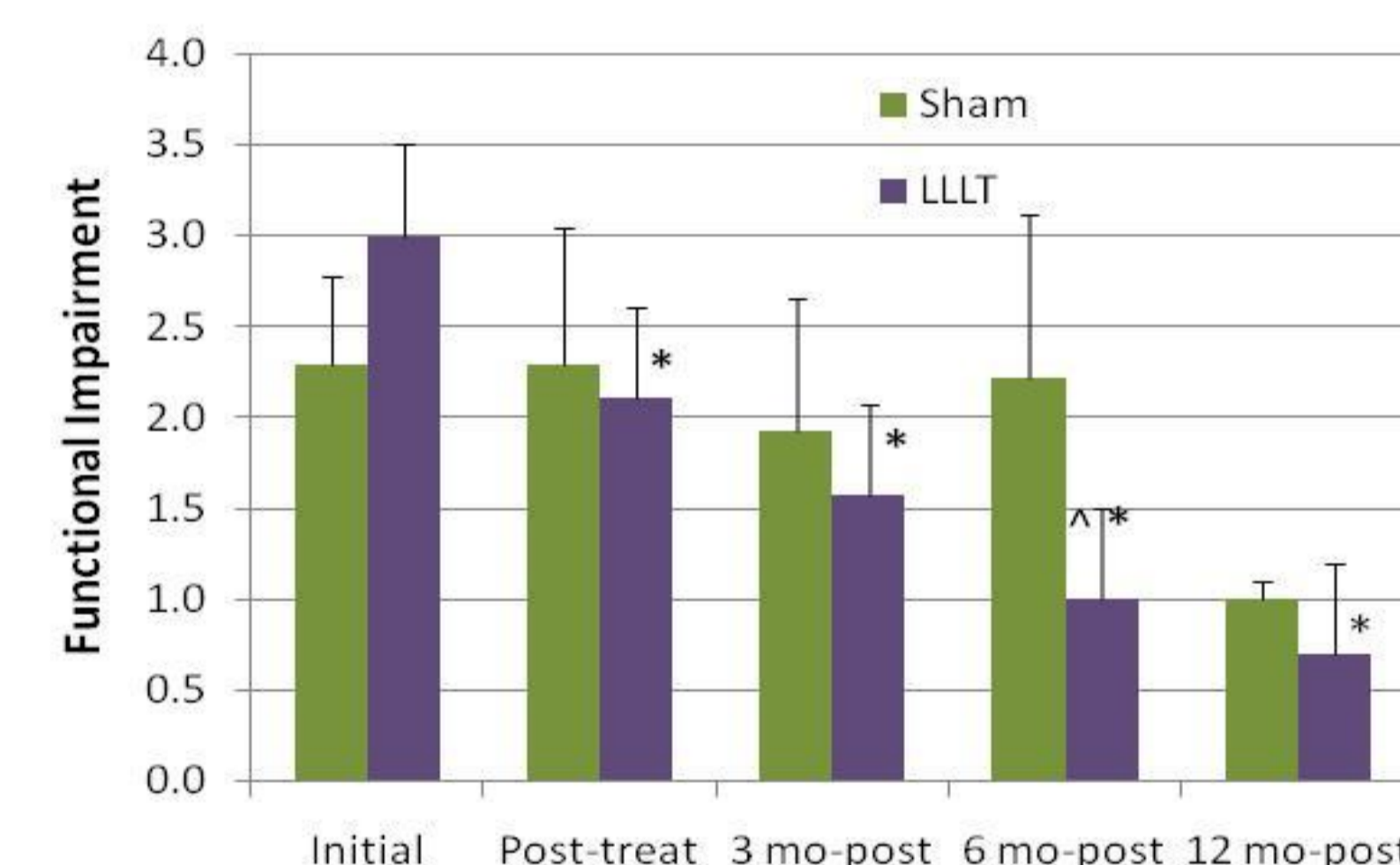


Figure 3. Functional Impairment (1-5, 1 = Useless).
*Significantly different from pre-treatment
^Significantly different from sham group.
p<0.05

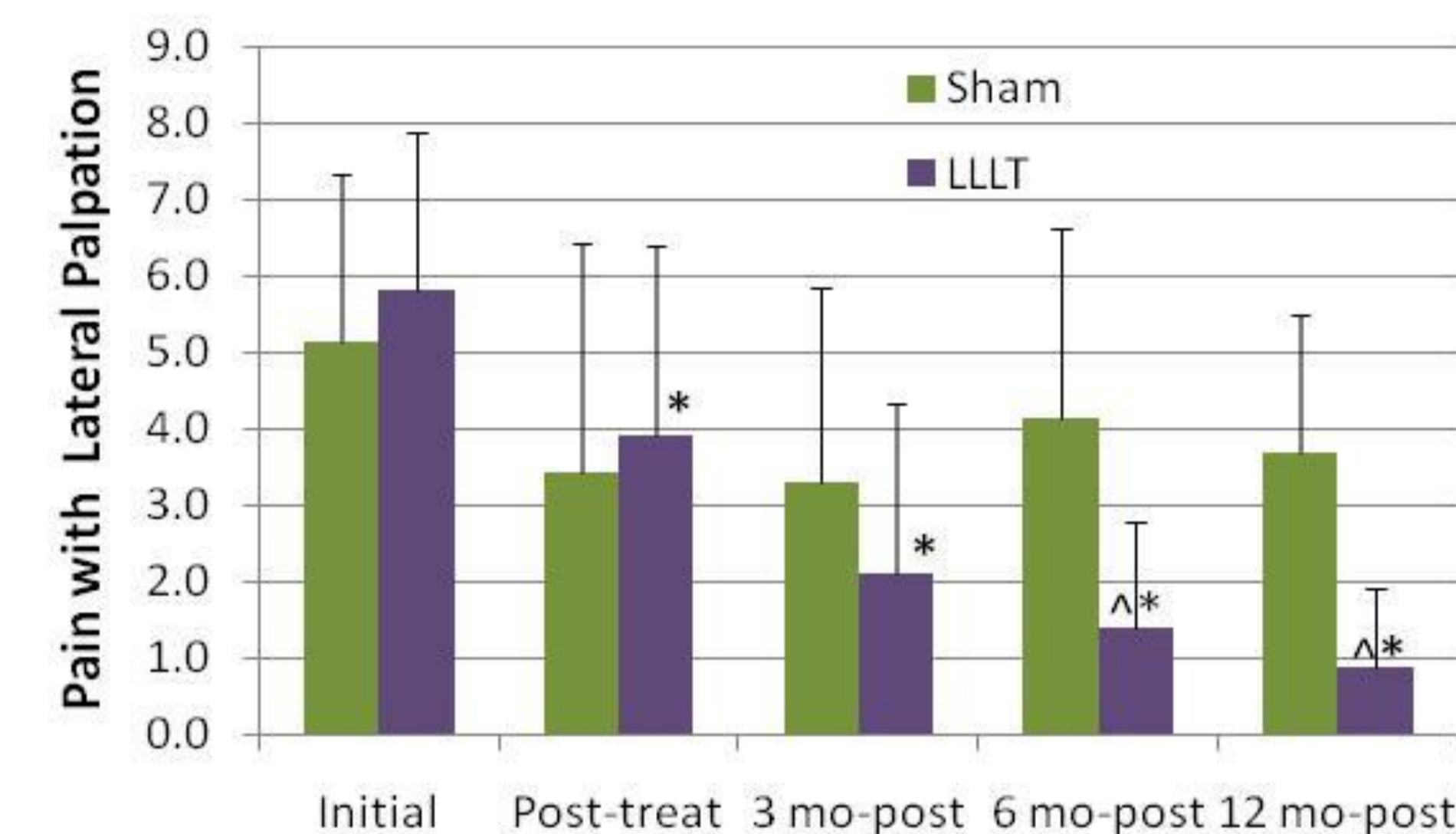
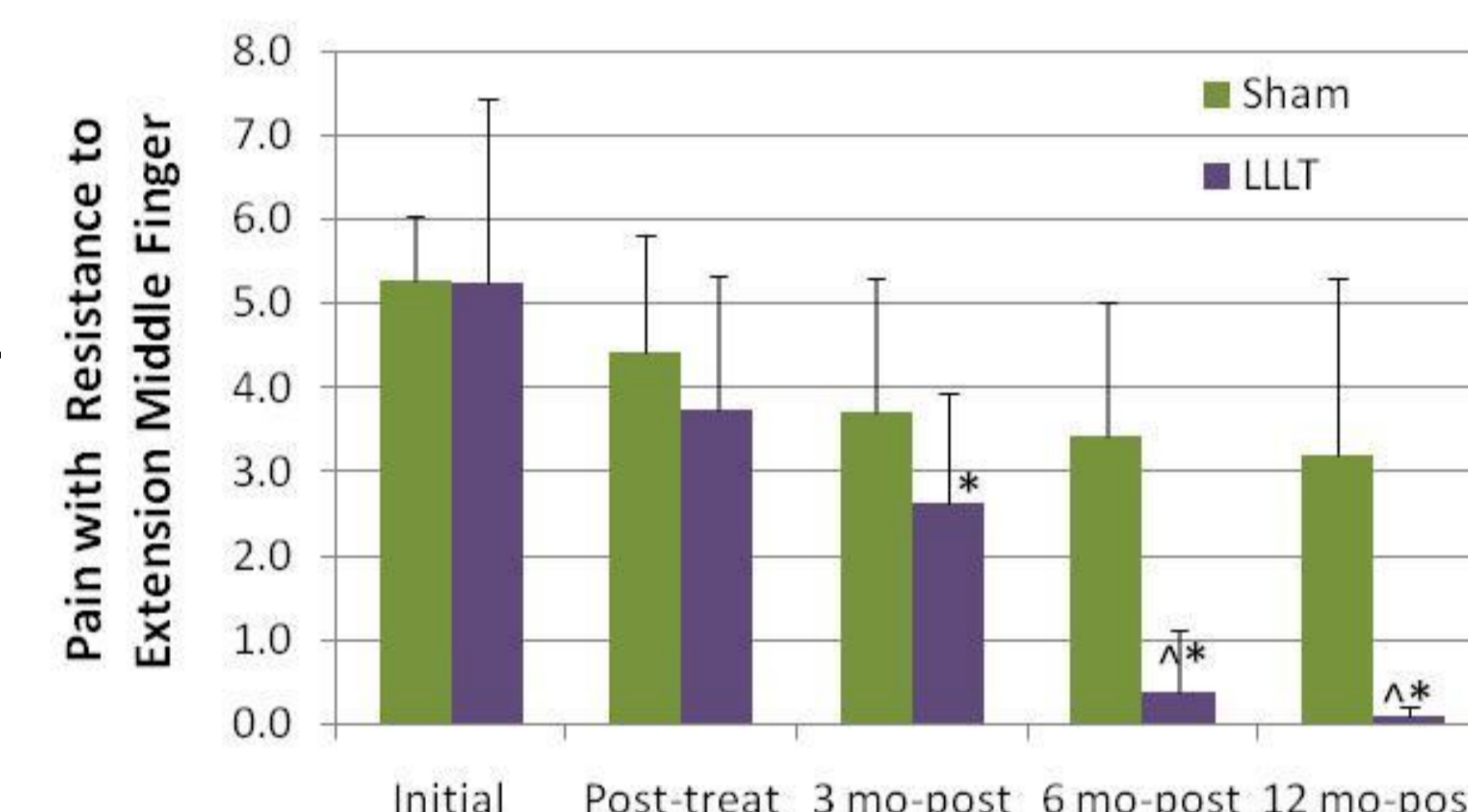
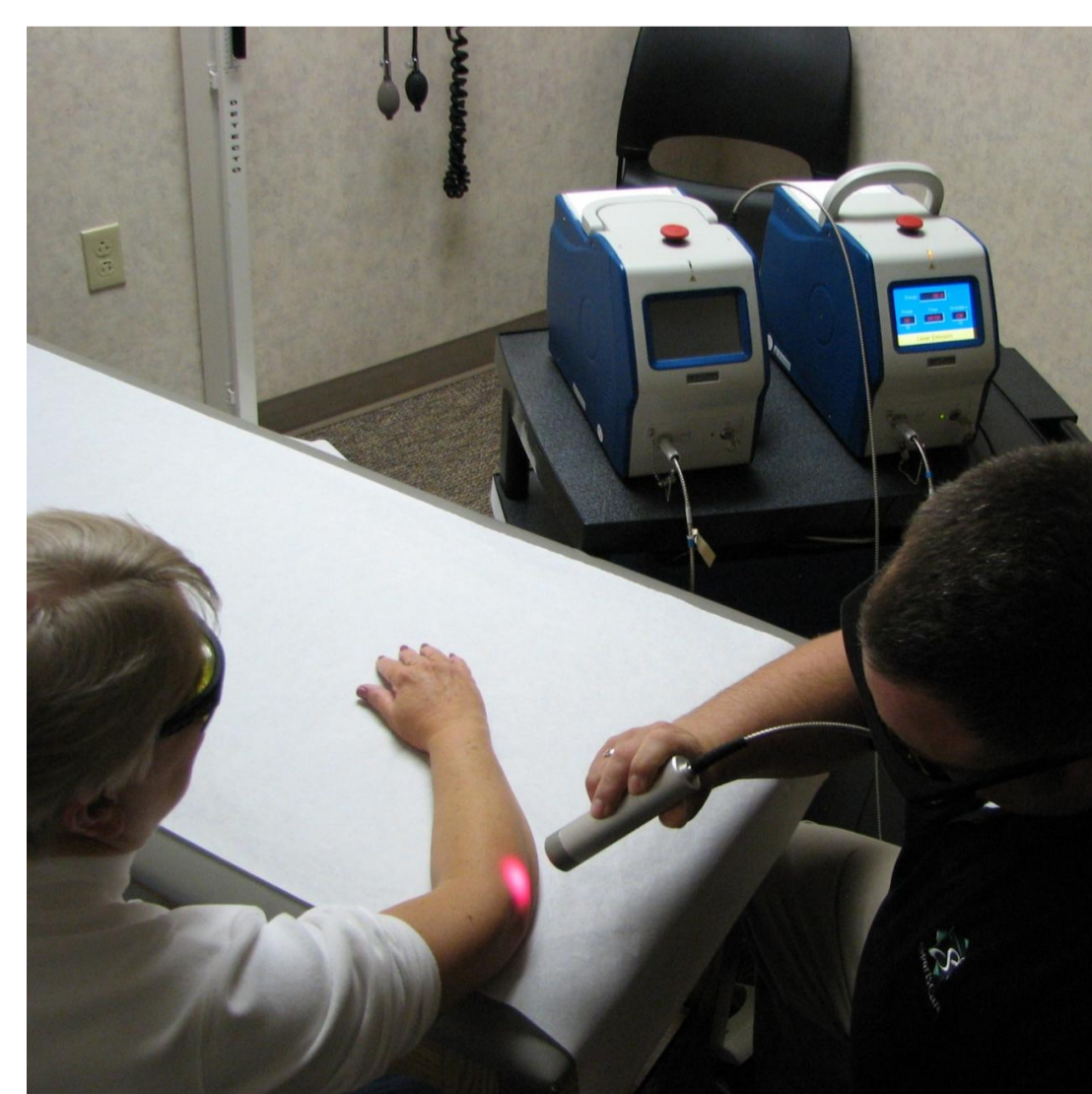


Figure 4. Lateral Pain With Palpation (VAS1-10).
*Significantly different from pre-treatment
^Significantly different from sham group.
p<0.05

Figure 5. Pain With Resistance Extension Middle Finger (VAS1-10).
*Significantly different from pre-treatment
^Significantly different from sham group. p<0.05



Methods



- 15 subjects with lateral elbow pain were randomized into sham or LLLT groups
- Blinded examinations confirmed tendinopathy of the extensor carpi radialis brevis tendon. Pain, range of motion, strength and function were assessed
- Eight 5.5 min treatments (10 J/cm²) were administered over 18 days using either the LCT 1000 or an identical sham instrument
- Reevaluations were made by blinded physicians following final treatment and again at 3,6 and 12 mo.

Conclusions

LLLT using a class IV solid state diode dual wave-length (980/810 nm) laser with a dose of 8 treatments of 10 J/cm² over 18 days was found to be efficacious for the reduction of pain and loss of strength seen with chronic tendinopathy of the extensor carpi radialis brevis tendon. The potential for a fast, safe and effective treatment warrants further investigation.



References

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