



LASERS & TENS

Class 4 Laser Therapy for a Rotator-Cuff Injury: Case Study

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WHAT YOU NEED TO KNOW

- Rotator-cuff injuries, ranging from tendinopathies to tears, affect a significant portion of the population.
- Conventional treatments range from conservative approaches, such as physical therapy and non-steroidal anti-inflammatory drugs (NSAIDs), to surgical interventions.
- However, recent advances in therapeutic modalities have introduced class 4 laser therapy as a potential alternative.

Rotator-cuff injuries are a common cause of shoulder pain and functional impairment.¹ Various treatment modalities² are available to manage these injuries, with class 4 laser therapy emerging as a promising non-invasive option. This case study explores the application of class 4 laser therapy in the rehabilitation of a patient with a rotator-cuff injury, analyzing its effectiveness, safety and implications for clinical practice.

Background

Rotator-cuff injuries, ranging from tendinopathies to tears, affect a significant portion of the population, particularly individuals engaged in overhead activities or repetitive motions.³ These injuries can lead to pain, reduced range of motion and diminished quality of life.

Conventional treatments range from conservative approaches, such as physical therapy and non-steroidal anti-inflammatory drugs (NSAIDs), to surgical interventions. However, recent advances in therapeutic modalities have introduced class 4 laser therapy as a potential alternative for

managing rotator-cuff injuries.⁴⁻⁵

The Case

“Jack,” a 42-year-old male, presented with complaints of persistent shoulder pain, limited range of motion, and difficulty performing daily activities following a traumatic fall. Magnetic resonance imaging (MRI) revealed a partial-thickness tear in the supraspinatus tendon of his right shoulder. Physical examination indicated pain and weakness during abduction and external rotation.

Jack’s treatment plan comprised an individualized combination of chiropractic adjustments to the upper thoracic and cervical spine, class 4 laser therapy, and instruction on proper home exercises. Laser was integrated into the plan due to its reported benefits in reducing pain and promoting tissue healing.⁶

Class 4 laser therapy involves the application of red and infrared laser wavelengths to stimulate tissue healing and modulate inflammation. It works through the process of photobiomodulation,⁷ in which photons are absorbed by cells, leading to enhanced cellular metabolism, increased circulation, and reduced pain proprioception.⁸

Over the course of six weeks, Jack underwent 14 class 4 laser therapy sessions, each lasting around 10 minutes. A laser probe emitting laser wavelengths of 650, 810, 915 and 980 nanometers (nm) was applied to the cervical spine and cervical nerves extending into the brachial plexus, and targeted the supraspinatus muscle and supporting structures of the affected shoulder.

Treatment was delivered from all angles to target all affected tissues. The laser was set at a power output of 9.2 watts, delivering continuous-wave and various pulse frequencies.⁹ Outcome measures consisted of the following:

- *Visual Analog Scale (VAS)*: Jack’s pain levels were assessed using the VAS, with scores recorded before and after each laser therapy session.
- *Range of Motion (ROM)*: Shoulder abduction and external rotation were measured using a goniometer to evaluate improvements in range of motion.
- *Strength Testing*: Isometric strength of the supraspinatus and deltoid muscles was assessed using a handheld dynamometer.
- *Patient-Reported Outcome Measures*: Functional assessments¹⁰ were used to evaluate improvements in daily functioning and quality of life.

Results and Clinical Takeaway

After the six-week treatment period, Jack exhibited significant improvements in pain reduction, range of motion, and strength. The VAS scores consistently decreased after each laser therapy session, indicating a reduction in pain levels. His ROM increased by approximately 30% in both abduction and external rotation. Isometric strength testing showed a 20% improvement in supraspinatus and deltoid muscle strength. Moreover, the DASH¹¹ score decreased from 52 to 18, suggesting enhanced functional ability and quality of life.

The positive outcomes observed in this case study align with previous research on class 4 laser therapy for rotator-cuff injuries.¹²⁻¹³ The mechanism of photobiomodulation has been shown to accelerate tissue repair by promoting cellular metabolism, collagen synthesis and angiogenesis.¹⁴ The analgesic effect of laser therapy may contribute to improved range of motion and muscle

activation, as observed in Jack's case.

The non-invasive nature of class 4 laser therapy offers several advantages, including minimal side effects and the potential to reduce reliance on NSAIDs or invasive procedures. However, the optimal dosage parameters, such as wavelength, power and treatment duration, remain areas of ongoing research and discussion.

This case study highlights the potential benefits of integrating class 4 laser therapy into the chiropractic treatment plan for rotator-cuff injuries. The observed improvements in pain reduction, range of motion and muscle strength suggest laser therapy could serve as an effective adjunct.

As the field of laser therapy continues to evolve, it has the potential to revolutionize the management of musculoskeletal injuries, offering patients non-invasive options for pain relief and functional improvement.

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