

## CAN LOW-ENERGY LASERS ELIMINATE THE NEED FOR A LATENCY PERIOD IN MANDIBULAR OSTEODISTRACTION? AN EXPERIMENTAL STUDY

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### ABSTRACT

**Purpose:** The experiment was conducted to evaluate the effect of the application of low-intensity laser irradiation on the healing of distracted dog's mandibles after distraction osteogenesis was applied without a latency period.

**Material and Method:** Eight healthy adult mongrel dogs were used and were subdivided into two equal groups (A & B) that underwent distraction osteogenesis at a rate of 1 mm/day in two 12 hourly increments of 0.5 mm each for a period of ten days. Group A animals received 3 minutes of low-intensity laser irradiation on alternate days for the ten day period of distraction as well as for four weeks of consolidation. Group B animals received the same protocol of distraction but no laser irradiation. One animal from each group was excluded because of spontaneous premature loss of the distraction device. The animals were humanely killed after six weeks from the start of the experiment. Their mandibles were dissected free and each half mandible was measured, examined macroscopically and the distraction areas were prepared for H.&E. histologic examination.

**Results:** The operated upon right sides of the mandibles were longer than the unoperated left sides by an average of 8.566 mm in the laser-irradiated animals and 8.5 mm in the non-irradiated animals, with resulting deviation of the midline towards the unoperated side. Histologic examination revealed bone healing in both groups, with more advanced healing and bone remodeling in the laser-irradiated group.

**Conclusions:** There was no distinct difference in the stability of distraction when no latent period was allowed in both low-intensity laser irradiated and non-laser irradiated groups. Low-intensity laser irradiation following distraction with no latent period, however, manifestly encouraged and accelerated bone healing and remodeling.

### INTRODUCTION

Although distraction osteogenesis, the technique involving the creation of new bone by gradual distraction of two bony fragments following their surgical separation, was initially developed by

Codivilla (1904), it actually owes its widespread application to the pioneering work of Ilizarov in the 1950s (Ilizarov 1971, Lotfy, 2000), who then went on to use the technique for long bone lengthening (1989), after having previously established the basic principles for its use (1988). It is now widely

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