

A Comparative Study of the Effectiveness of Immediate Versus Delayed Photobiomodulation Therapy in Reducing the Severity of Postoperative Inflammatory Complications

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Abstract

Objective: The aim of this study was to compare the immediate versus the delayed application of photobiomodulation (PBM) therapy following odontectomy of horizontally impacted mandibular third molars, and assess which application method is more effective at reducing postoperative complications. **Background data:** Surgical removal of horizontally impacted mandibular third molars is a common surgical procedure, usually associated with postoperative complications such as pain, swelling, and trismus. Several attempts have been made to minimize these complications. One such method is the use of PBM therapy. **Methods:** Eighty patients with horizontally impacted mandibular third molars with no inferior alveolar canal approximation were recruited for this study. They were divided into two groups. The immediate group received PBM therapy immediately after surgery and on the 3rd day postoperatively. Subjects in the delayed group received PBM therapy on the 2nd and 4th days postoperatively. All subjects received 2 min of treatment using a 4 W laser beam, during which 171 J were delivered via a 2.8 cm² spot size. **Results:** Clinical and statistical results showed a significant reduction in pain, trismus, and swelling in the immediate PBM therapy group compared with the delayed PBM therapy group. **Conclusions:** Immediate PBM therapy is more effective than delayed PBM therapy in minimizing the complications associated with mandibular third molar removal surgery.

Introduction

IMPACTED TEETH ARE DEFINED AS those teeth that are prevented from eruption into their normal position because of lack of space or other impediments.^{1,2} They are considered a pathologic condition that requires management in the form of surgical removal. The surgical procedure, however, involves the manipulation of both soft and bony tissues and is, therefore, associated with postoperative complications such as pain, trismus, and swelling.³ These complications are a manifestation of the inflammatory processes that ensue following surgical trauma.^{4,5}

Throughout the literature and over the years, authors have recognized the value of comprehensive treatment planning in minimizing postoperative complications, because it allows surgeons to modify their surgical technique accordingly. Preoperative assessment should include a detailed history of the case, a thorough clinical examination, and

adequate imaging examination in order to accurately classify the impacted tooth and localize it in relation to neighboring vital structures.^{6–8} Imaging examinations usually consist of a panoramic radiograph that may be supplemented with intraoral periapical radiographs. However, these images are limited by their two dimensional (2D) nature. More recently, cone beam computed tomography (CBCT) has become the preferred imaging modality for assessment of impacted teeth. It offers many advantages such as submillimeter spatial resolution and relatively low radiation doses when compared with multidetector CT.

Prescribed medications such as corticosteroids and nonsteroidal anti-inflammatory drugs (NSAIDs) are an integral part of a surgeon's armamentarium to relieve pain, trismus, and swelling following third molar surgery. However, these medications carry side effects and may be contraindicated for some patients. Therefore, there is a pressing need to find an alternative with no side effects. Photobiomodulation

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