Evaluation of alveolar bone preservation after early molar extraction combined with scaffold biomaterial grafting and photobiomodulation: a randomized, blinded clinical study.

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The bone graft added to the dental socket immediately after tooth extraction prevents atrophy and deformity of the bone at the site of element loss, allowing for further rehabilitation with implants. Photobiomodulation is a light-based approach that accelerates bone healing; stimulates blood flow; activates osteoblasts, decreases osteoclastic activity, and improves the integration of the biomaterial with bone tissue. The goal of this study is to develop a protocol for the management and preservation of alveolar bone after the loss of first and/or second permanent molars in pre-teen and teenage subjects between 8 and 17 years, with an indication for extraction. Materials and methods: 60 patients will be randomized and randomly divided into 4 groups, n= 15: Exo (extraction), Exo+Laser (extraction and laser treatment), Exo+Biomat (extraction with biomaterial), Exo+Biomat+Laser (biomaterial extraction and grafting and laser treatment). The biomaterials will be Geistlich Bio Oss Collagen ® and Geistlich Mucograft® (Switzerland), added to the socket immediately after molar extraction. Laser groups (λ = 808 nm, power = 100 mW, radiant energy 3J per point in 3 vestibular, occlusal, and lingual/palatal points), will receive irradiation immediately after the surgery, 48 h and 10 days after surgery, in the Exo and Exo+Biomat, will use a similar laser device without emission of irradiation. Analyzes: computed tomography and intraoral scanning performed preoperatively, 3 and 6 months after surgery; to assess bone volume by measuring the height and width of the socket in each group, trabecular bone, and the interdental space of the teeth lateral to the missing element. The clinical study received approval from the ethics committee and is in the recruitment phase.