

## Poster Session

wavelength of 650 nm and 25 mW power for 15 seconds per tooth. The laser was applied to the upper arch (46 teeth), while the lower arch (50 teeth) acted as the control group, at three specific points per tooth: the apical, mesial buccal, and distal buccal levels. Treatment was performed 24, 48, and 72 hours after appliance activation. The Wong-Baker Pain Scale was used to quantify pain levels before and after treatment.

**Results:** Patients reported a significant reduction in pain after each laser session. Moderate to severe pain levels decreased rapidly within 48 hours in the experimental group (upper arch treated with biomodulation), while the control group (lower arch, no laser therapy) experienced slower pain relief. On the Wong-Baker Pain Scale, pain intensity dropped by an average of 2-3 points after each laser session.

**Conclusion:** Biomodulation at a wavelength of 650 nm is an effective and non-invasive method to reduce pain after orthodontic appliance activation. This approach provides a promising alternative to traditional drug-based pain relief, reducing the need for systemic analgesics and offering faster pain management.

### P-038

**Luca Elena Ruxandra, Mariana Miron, Ioana Roxana Munteanu, Anișoara Borozan, Carmen Darinca Todea** (Romania)

**Category:** Original research: Preclinical

**Title:** ALTERNATIVE TECHNIQUES FOR FIXED PROSTHETIC RESTORATION REMOVAL: AN IN VITRO STUDY ON THE Er:YAG LASER DEBONDING EFFECTIVENESS OF 4 DIFFERENT TYPES OF RESTORATIONS AND 2 CEMENTS

**Aim:** The purpose of this study was to analyse the effect of Er: YAG laser radiation in debonding 4 different types of ceramic FPR, cemented with 2 different type of cements. We carried out a comparative analysis between the behaviour of different types of ceramic prosthetic restorations under the action of laser radiation, analysing the integrity of prosthetic restorations and dental surfaces subjected to the action of laser radiation.

**Material and methods:** The study included 16 extracted teeth which were prepared as abutments and their surface was visualised using optical microscope in order to appreciate the surface of the enamel, after which they were

scanned and working models printed of black resin were produced. The study groups were established and four types of ceramic restorations were produced, in accordance to the previously established groups: Monolithic zirconia(MZ), Layered zirconia(LZ), Lithium disilicates(LD) and Feldspathic(F). Measurement of the prosthetic restorations thickness was done in 3 points. For cementation, 2 types of cement were used: Relyx Veneer 3M ESPE and Variolink Esthetic LC. After cementation, ceramic RPFs were prepared for debonding, which was conducted using an Er:YAG radiation. Debonding of the ceramic FPR was done with the Er:YAG Fotona StarWalker MaQX laser, using a R14 sapphire tip, at a distance of 10mm, using parameters of 275mJ, 20 Hz, 5,5W with air cooling (setting 1 of 9) and water, the optimal parameters being determined after testing cemented ceramic materials on a pilot support. The irradiation time needed for debonding to be efficient varied between samples from 17s (LD cemented with Rely X) to 250s (DL and F cemented with Variolink).

**Results:** Following the experiment, 23 ceramic FPR were debonded, of which 12 were intact and the others fractured into two or three pieces. Debonding occurred without damaging the tooth structure, according to the images obtained under the optical microscope. The success rate of different types of restoration resulted as follows: 100% success rate for both LZ and F groups, followed by 87% success rate for LD group, and 0% for MZ. Regarding the type of cement, debonding of ceramic FPR cemented with RELYX was successful in 75% of the cases, in comparison with 69% success rate in case of Variolink DC.

**Conclusion:** In conclusion, Er:YAG radiation has proven to be a successful and conservative method for debonding most ceramic prosthetic restorations.

### P-039

**Ronaldo Tuma, Thayná Vianna da Rocha, Eurydice Castro de Moraes, Fernando Rodrigues de Carvalho, Luciane Hiramatsu Azevedo** (Brazil)

**Category:** Case report

**Title:** PHOTOBIMODULATION THERAPY IN DIFFERENT CONDITIONS RESULTING FROM SEVERE FACIAL TRAUMA - CASE REPORT

**Aim:** Photobiomodulation Therapy (PBMT) for Peripheral Facial Paralysis (PFP); Allodynia in the

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scar region; Limitation in mouth opening (LMO).

**Case description:** A 50-year-old male patient came to the clinic on 05/08/2024 after having undergone surgery on 04/24/2024 to decompress the facial nerve on the right side, in order to reverse the PFP resulting from trauma caused by the impact of a backhoe blade that fractured the temporal bone and injured the left side of the face, causing allodynia in the scar region and significant LMO.

PBMT was performed using a low-power laser. The right hemiface affected by PFP was irradiated with the e-Light at a wavelength of 808nm, 56 points, 4J/point, distributed along the path of the facial nerve and the stylomastoid foramen region. The same equipment was used for allodynia, irradiating 8 points, 4J/point, over the affected region. Regarding LMO, Therapy EC and e-Light were used, both at 808nm, 3J/point, irradiating 17 points bilaterally encompassing structures related to mouth opening. Equipments: Therapy EC, DMC, 100mw - 808nm, light emitting diode, spot 0.0984cm<sup>2</sup>; e-Light, DMC, 120mw - 808nm, light emitting diode, spot 0.029cm<sup>2</sup>.

Parameters used: PFP: PD = 4.138W/cm<sup>2</sup>, ED = 955.862J/cm<sup>2</sup>, Time = 231s, 2 times/week, 808nm; Allodynia: PD = 4.138W/cm<sup>2</sup>, ED = 136.551J/cm<sup>2</sup>, Time = 33s, 2 times/week, 808nm; LMO: Therapy EC - PD = 1.016W/cm<sup>2</sup>, ED = 670.731J/cm<sup>2</sup>, Time = 660s, 2 times/week, 808nm - e-Light - PD = 4.138W/cm<sup>2</sup>, ED = 136.551J/cm<sup>2</sup>, Time 33s.

Total time: 924s (There are common areas during irradiation).

Cumulative dose: 376J per session and 4,136J total over 11 sessions.

Results: PFP - Initial - House-Brackmann classification (H-B) = V (Severe dysfunction), final - H-B = IV (Moderate to Severe dysfunction);

Allodynia - Patient reported absence after 6th session;

LMO - Initial = 28mm; 6th session = 38mm, Final = 42mm (11th session);

The patient continues to be treated for PFP twice a week.

**Discussion:** PBMT has already been used with excellent results in cases of LMO, orofacial pain and PFP.

**Conclusion:** To date, we have concluded that the protocols applied have been successful in improving the patient's conditions and symptoms.

### P-040

**João Victor Rodrigues, Pedro Henrique Petrilli, Amanda Paino-Sant'Ana, Valdir Goveia Garcia, Renato Corrêa Viana Casarin, Leticia Helena Theodoro** (Brazil)

**Category:** Original research: Clinical  
**Title:** ANTIMICROBIAL PHOTODYNAMIC THERAPY AS AN ADJUVANT TO NON-SURGICAL PERIODONTAL TREATMENT IN INDIVIDUALS WITH DOWN SYNDROME: A RANDOMIZED CONTROLLED CLINICAL STUDY

**Aim:** Individuals with Down Syndrome (DS) have an abnormal susceptibility to infections in the oral cavity, which may contribute to the development of periodontal diseases. Some studies have demonstrated a higher prevalence and greater severity of periodontal disease in individuals with DS. The aim of this study was to evaluate the use of a single session of antimicrobial photodynamic therapy (aPDT) protocol as an adjuvant to non-surgical periodontal treatment in individuals with DS.

**Material and methods:** Thirty individuals with DS and stages I and II grade B periodontitis were allocated into the following groups: SI (n=17) – subgingival instrumentation (SI) in a single session; SI+aPDT (n=17)- SI in single session in the pockets with probing depth (PD) ≥4 mm and bleeding on probing (BoP), methylene blue irrigation (100 µg/ml) after 60 seconds, and diode laser (AlGaInP; 660 ± 10 nm; Laser Duo, MM Optics, Ltda, São Carlos, SP, Brazil) for 50 seconds, totaling 166 J/cm<sup>2</sup>, 5 J energy at a power of 100 mW. Periodontal clinical parameters PD, BoP, clinical attachment level (CAL) and immunological analysis interleukin (IL)-17, IL-1B, IL-6, IL-8 were evaluated at baseline and on 60 and 90 days. All data were submitted to statistical analysis (α=5%).

**Results:** A reduction in BoP was observed at 60 and 90 days in the SI+ aPDT group and in the SI group at 90 days. In the SI group, there was a significant reduction in the percentage of PD 4-5 mm at 90 days. In group SI+ aPDT, a reduction in the percentage of PD 4-5 mm could also be observed. In the SI group, an increase in the percentage of CAL ≤2 mm was noted at 60 days to 90 days. Both groups showed a significant reduction in IL-17 levels on 60 and 90 days. The intergroup comparison has revealed no statistically significant differences.