

# Low-level laser therapy in neurosensory recovery – case series in dental and maxillofacial rehabilitation

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**Results:** The group featuring BIS-Silane with longer application time (G1T2) presented a mean  $\mu$ TBS value ( $32.4 \pm 19.6$  MPa) significantly higher to all other groups ( $p < .001$ ). Monobond Plus registered the lowest mean  $\mu$ TBS value (G3T1 –  $18.5 \pm 7.3$  MPa) and (G3T2 –  $17.3 \pm 5.8$  MPa). The type of silane coupling agent has shown to have a significant influence on the microtensile bond strength ( $p = .001$ ;  $\eta^2 = 0.16$ ).

**Discussion and conclusions:** Some authors have previously suggested that silanization could benefit from longer application times, but seldom research has been found featuring this variation protocol [3,4]. Silanes require a hydrolysis process in order to establish chemical bonds. Two-bottle systems show the highest bond strength results and may benefit from longer application times. The addition of 10-MDP seems to have no significant advantage over traditional silane coupling agents.

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## Low-level laser therapy in neurosensory recovery – case series in dental and maxillofacial rehabilitation

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### ABSTRACT

**Introduction:** Neurosensory disorders may be considered as a complication from surgical procedures, such as dental implants and mandibular osteotomy [1–3]. In these cases, the orofacial damage can involve general and professional patient impairments. Low-level laser therapy (LLLT) has been reported to be effective in reducing neurosensory recovery time, while promoting nerve regeneration [4,5]. This study aimed to analyse the LLLT impact on postsurgical neurosensory recovery, namely for dental and maxillofacial surgery patients.

**Materials and methods:** Patients previously submitted to dental and/or maxillofacial rehabilitation at Centro Hospitalar Universitário de Coimbra/Faculty of Medicine, University of Coimbra, were selected. Anamnesis, examination and neurosensory evaluation were performed to determine the presence and location of neurosensory disorder. The elected orofacial area was irradiated using a continuous wave diode laser at 660 nm (SIROLaser Blue; Sirona, Bensheim, Germany) in two sessions per week, until satisfactory results were achieved. The measure of health-related quality of life was performed by EQ-5D-5L questionnaire, before and after the LLLT treatment. This study was approved by the ethics committee of Faculty of Medicine of the University of Coimbra and the informed consent document was performed.

**Results:** Two patients (both Female, Age 22) were selected. Treatment lasted approximately 1 month in both cases. The mean score before and after treatment (0–100 scale), of the EQ-5D-5L questionnaire was 70.0–95.5. The recovery of the neurosensory disorder allowed the quality improvement in all 5 dimensions: mobility, self-care, daily activities, pain/discomfort and anxiety/depression. No reactions or side-effects were reported.

**Discussion and conclusions:** 5 dimensions of health quality were analysed and the severity level degrees were related with the corporal/patient impairment. The results supported the use of LLLT as an effective treatment option by accelerating the recovery of postsurgical neurosensory disturbances, improving the patient's health.

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## Marginal microleakage of flowable resin composites used to adhere Semi-Direct restorations

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### ABSTRACT

**Introduction:** Conservative Dentistry has gradually replaced traditional invasive procedures with minimally invasive techniques that rely on adhesion to tooth substrates [1]. Due to these recent developments, indirect restorations are increasingly used in contemporary practice. In order to bond these restorations, a vast choice of materials exist, and these include flowable resin composites [2,3]. However, studies featuring these materials are seldom found [3]. The aim of this *in vitro* pilot study was to evaluate and compare the microleakage of indirect restorations luted with a flowable composite and different luting agents.

**Materials and methods:** This study was approved by the Ethics Committee of Egas Moniz, CRL. Thirty human molars were randomly divided between 3 groups ( $n = 10$ ) according to the luting agent used: resin cement Bifix QM (VOCO GmbH, Cuxhaven, Germany) (G1), pre-heated resin composite Z100 MP Restorative (3M ESPE) (G2) and flowable composite GrandioSO Flow (VOCO GmbH, Cuxhaven, Germany) (G3). Standardised class V cavities were prepared in the buccal surface and immediate dentine sealing was carried out with Optibond FL (Kerr). Composite restorations were made using a semi-direct technique with GrandioSO (VOCO GmbH, Cuxhaven, Germany). After 24 h cavities and restorations were pre-treated and adhesively luted according to the groups. After finishing and polishing, specimens were stored in distilled water at 37 °C for 24 h. After thermal aging (500 cycles at 5–55 °C) teeth were sealed and immersed in 0.5% basic fuchsin dye for 4 h. Each specimen was then sectioned vertically and microleakage was assessed and classified for both occlusal and cervical margins according to ISO/TS 11405:2015. The results were statistically analysed by Kruskal–Wallis (KW) test and binomial data analysis, at a significance level of 5% (SPSS 24.0).

**Results:** There were no significant differences in microleakage scores between the tested groups ( $p > .05$ , KW). All the groups scored more leakage in cervical margins. Binomial analysis confirmed that the success rate was material and margin dependent. The probability of failure of a cervical margin bonded to Z100 (G2) and to GrandioSO Flow (G3) using a semi-direct technique was significantly higher than 50% ( $p = .021$ ) and ( $p = .002$ ) respectively. Z100 had 100% failure rate in the cervical margin.

**Discussion and conclusions:** Longevity of a bonded interface is determined by sealing and microleakage. When this interface is compromised, failure of the restoration may happen [4]. Microleakage occurred in composite restorations made semi-directly the same way amongst the different materials used for bonding. However, cervical margins bonded with resin composites carry a greater chance of failure.

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