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Annals of Medicine

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/iann20

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To cite this article: Inês de Sousa Correia, Inês Caetano Santos, Luís Proença, Mário Polido & Ana Azul (2021) Marginal microleakage of flowable resin composites used to adhere Semi-Direct restorations, Annals of Medicine, 53:sup1, S52-S53, DOI: 10.1080/07853890.2021.1897362

To link to this article: https://doi.org/10.1080/07853890.2021.1897362

Published online: 28 Sep 2021.

Acknowledgements

The authors acknowledge APEX, Dentsply Sirona and the Forensic Dentistry Laboratory of the Faculty of Medicine of University of Coimbra for their many useful contributions to this work.

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DOI: 10.1080/07853890.2021.1897361

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 (3 M 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 fuchsine 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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Acknowledgements

The authors acknowledge the material funding from VOCO GmbH, the Biomaterials Laboratory of the IUEM and Clínica Dentária Egas Moniz.

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DOI: 10.1080/07853890.2021.1897362

Multidisciplinary team in temporomandibular disorders

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ABSTRACT

Introduction: The temporomandibular disorders (TMD) are one of the main concerns regarding orofacial pathologies and there are an ascending number of cases. They are characterised as a group of pathological conditions that may affect the temporomandibular joint (TMJ), the masticatory musculature and/or other adjacent anatomical structures, leading to pain and dysfunction [1]. The multifactorial aetiology of TMD affects a relatively large number of the world population and requires a multidisciplinary evaluation and diagnosis by the clinical team [2]. Among the various elements that constitute the multidisciplinary team we highlight the dentist and the physiotherapist. The dentist as a first-line professional, most of the time is responsible for the identification of patients potentially at risk and for the follow-up of those who already present the disease [3]. On the other hand, the physiotherapist aims to reduce musculoskeletal pain, promote muscle relaxation, reduce muscle hyperactivity, improve function by restoring the quality and quantity of mandibular movements and maximise joint mobility [4].

Description of the clinical case: A 24-year-old female patient with a history of temporomandibular disorder and bruxism she presented an non-assisted mouth opening (UMO) of 28 mm and an assisted mouth opening with pain in the masseter and TMJ bilaterally of 29 mm, after the clinical assessment with the DC/TMD protocol we arrived at a diagnosis of disc displacement without reduction (DDwR) with limited opening, degenerative joint disease in the left TMJ, arthralgia (II), myofascial pain (III) in the masseter with pain referred to other anatomical regions. All the assumptions of the Helsinki Declaration have been fulfilled and an informed consent for clinical case of Clinica Dentária Egas Moniz approved by the ethic commission of Instituto Universitário Egas Moniz. The treatment plan consisted of cognitive behavioural therapy (CBT), prescription of muscle relaxants, occlusal splint especially for reduction of overload due to bruxism, infiltration with 1 ml of hyaluronic acid of high molecular weight in the TMJ bilaterally followed by articular mobilisation techniques and neuromuscular and myofascial techniques. The patient was instructed to continue with the physiotherapy.

Results: The follow up was made 2 months after with 8 sessions of physiotherapy and 1 more hyaluronic acid infiltration bilaterally as protocoled session, we could observe an absence of temporomandibular joint pain, UMO of 42 mm, decreased crepitation, decreased intensity of myofascial pain (I) and (DDwR) without limited opening.

Discussion and conclusion: The multidisciplinary dentist-physiotherapist team combines inputs from different professions with the aim of promoting the best patient care and represents an added value for the management of the signs/symptoms of patients with temporomandibular dysfunction.

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Acknowledgements

The authors would like to acknowledge the patient that participate on the study.