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**Biological assessment of 3D printed resins for interim restorations
using an organotypic model of oral mucosa cells**

**Avaliação biológica de resinas impressas em 3D para restaurações
provisórias usando um modelo organotípico de células da mucosa
oral**

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ABSTRACT

Biological assessment of 3D printed resins for interim restorations using an organotypic model of oral mucosa cells

Statement of the problem: 3D printed resins are a new class of materials for making temporary restorations with great commercial appeal; however, little is known about the parameters of the confection technique that can influence the biological compatibility with oral tissues. **Purpose:** The objective of the present study was to evaluate the effect of the post-cure time on the cytotoxicity of two resins for printing interim restorations in a 3D organotypic model of the oral mucosa. **Material and methods:** Cylindrical samples were prepared with conventional acrylic resin (AR) and CAD-CAM resin (CC), composite resin (CR), and two biocompatible resins for 3D printing (3DP), submitted to post-curing in a UV light chamber for 1, 10 or 20 min (90 W, 405 nm). Standardized samples of the materials were incubated for 1, 3 and 7 days in close contact with an organotypic model of keratinocytes (NOK-Si) in co-culture with gingival fibroblasts (HGF-1) in a 3D collagen matrix, or directly with 3D HGF cultures with viability (Live / Dead n = 2) and cell metabolism (Alamar blue n = 4) being evaluated. Spectral scanning of the culture medium was performed to detect the release of resin components (n = 6) (ANOVA/Tukey; $\alpha = 5\%$). **Results:** Severe reduction in metabolism (> 70%) and viability of keratinocytes was observed for 3DP resin post-cured for 1 min in all periods of analysis in a time-dependent manner. This cytotoxic effect was moderate for the 3D culture of HGFs in both experimental models, being correlated to the intense leaching of components in the culture medium. The post-cured resins for 10 and 20 min promoted a mild-moderate cytotoxic effect in the period of 1 day, similar to AR; however, recovery of viability was observed at 7 days. The 3DP resins submitted to post-cure for 20 min showed a pattern similar to CR and CC at the end of the experiment. **Conclusions:** It was concluded that the cytotoxic potential on oral mucosa cells of the tested 3DP resins is influenced by post-printing processing, which may be related to the leaching of residual components.

Key words: cytotoxicity, 3D printing, oral mucosa cells
