

·基础与临床研究·

冷热循环对 CAD/CAM 树脂陶瓷复合材料表面粗糙度及形貌的影响

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【摘要】目的 研究冷热循环对 CAD/CAM 树脂陶瓷复合材料表面粗糙度及形貌的影响。**方法** 以树脂陶瓷复合材料 LU (Lava Ultimate), CE (Cerasmart), HY (Hyramic 润瓷), VE (Vita Enamic) 为实验组, 以长石质玻璃陶瓷 VM (Vita Mark II) 为对照组, 分别在抛光即刻和经 10 000 次冷热循环后 (冷热循环仪设置高温 55℃, 低温 5℃, 浸水时间为 30s), 测量表面粗糙度 R_a 并进行统计学分析, 扫描电子显微镜 (SEM) 观测试件表面形貌。**结果** 在抛光即刻, LU、CE、HY 和 VE 组的 R_a 值在 0.095~0.106 μm 之间, 组间差异均无统计学意义 ($P > 0.05$)。VM 组 R_a 值最小, 为 $(0.054 \pm 0.014) \mu\text{m}$, 与其他 4 组相比差异具有统计学意义 ($P < 0.05$)。经冷热循环后, 各组材料 R_a 值均增大, 但与抛光即刻相比差异无统计学意义 ($P > 0.05$)。老化后, VM 组 R_a 值仍小于其他 4 组, 差异具有统计学意义 ($P < 0.05$)。SEM 下表面形貌无明显变化。**结论** 经冷热循环后, CAD/CAM 树脂陶瓷复合材料和玻璃陶瓷表面微结构均较稳定。

【关键词】 CAD/CAM 树脂陶瓷复合材料 冷热循环 表面粗糙度 扫描电子显微镜

DOI : 10.11752/j.kqcl.2022.03.02

Effect of thermal cycling on surface roughness and topography of CAD/CAM resin ceramic composites

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【Abstract】Objective The aim of this study was to investigate the influence of thermal cycling on the surface roughness and topography of CAD/CAM resin ceramic composites. **Methods** Four kinds of CAD/CAM resin ceramic composites, LU (Lava Ultimate), CE (Cerasmart), HY (Hyramic), VE (Vita Enamic), and a feldspathic ceramic VM (Vita Mark II) were used for this study. The surface roughness of these materials were measured after polished immediately and after thermal cycling for 10 000 times (the high temperature was 55℃, the low temperature was 5℃, and the immersion time was 30s), and changes of microstructure were observed under scanning electron microscopy (SEM). The data were statistically analyzed. **Results** LU, CE, HY and VE exhibited statistically similar surface roughness values between 0.095~0.106 μm ($P > 0.05$), VM exhibited significantly lower surface roughness values ($0.054 \pm 0.014 \mu\text{m}$) than the other groups ($P < 0.05$). After 10 000 thermocycles, surface roughness values did not change significantly for all materials ($P > 0.05$). No obvious change of surface topography was observed under SEM. **Conclusion** The surface microstructure of CAD/CAM resin

基金项目: 中国康复研究中心青年基金课题 (编号: 2019zx-Q6)

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