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Comparison of dimensional accuracy of conventionally and digitally manufactured intra-coronal restorations

Leila Nasiry Khanlar and Reza Eftekhari Ashtiani
Shahid Beheshti University of Medical Sciences, Iran

Purpose: This study sought to compare the dimensional accuracy of intra-coronal restorations fabricated using digital and conventional techniques.

Materials & Methods: A sound mandibular molar tooth received standard onlay preparation. In group A, the onlays were made after conventional impression and conventional fabrication of resin pattern. In group E, the onlays were made after conventional impression and 3D printing of pattern. In group O, the onlays were made after intraoral scanning by Trios (3Shape) and the resin pattern was produced by 3D printing. Ten specimens were in each group and total 30 specimens were evaluated. Glass ceramic restorations (e.max Press, Ivoclar) were fabricated using the press technique. The replica technique was used to assess the marginal fit. Each replica was assessed in eight points. One-way ANOVA was used to compare the marginal gap among the three groups. Tukey's HSD test was applied for pairwise comparisons of the groups. $P \leq 0.05$ was considered statistically significant.

Results: No significant difference was noted in the marginal gap at the gingival margin among the three groups ($P=0.342$) but significant differences were noted among the three groups in the pulpal ($P=0.025$) and buccal ($P=0.0031$) areas. Comparison of the absolute gap among the three groups revealed that only groups A and E were significantly different ($P=0.020$).

Conclusions: Within the limitations of this study, it appears that restorations fabricated with the three techniques have dimensional accuracy within the clinically acceptable range. However, the conventional method yielded more accurate results

Biography

Leila Nasiry Khanlar has DDS and MS degrees. She has completed her Master of Science in Operative Dentistry from Shahid Beheshti University in 2007. She is an Assistant Professor and Researcher in Dental Materials field and Digital Technology at Shahid Beheshti University of Medical Sciences, Iran.

lana1354@yahoo.com

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