Three Year Analysis of Digitally Generated Restorations in a Predoctoral DDS Curriculum

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Objectives: The UTHealth Houston School of Dentistry integrated digital dentistry in 2019 and over 1,200 indirect restorations have been fabricated. This study aimed to evaluate clinical outcomes of these restorations from 2019-2022 by comparing type of restoration with (1) restoration status, (2) secondary visit reasons, (3) secondary treatment completed, and (4) return time following cementation.

Experimental Methods: A chart review was conducted for all ceramic crowns, inlays, onlays, and bridges generated through the 'SOD Digital Milling Lab' between August 1, 2019 and July 31, 2022 (n=656). Treatment notes were reviewed to determine restoration status, when and why secondary visits were needed and any treatment rendered (as applicable). Data was deidentified and collected using a REDCap database. Statistical analyses were performed using R statistical software with a p<0.05 and Pearson's chi-square, Fisher's exact, Kruskal Wallis, and Tukey-Kramer tests were completed.

Results: Tests revealed statistically significant relationships between variables 1-3 (p<0.05). Crowns had the lowest failures (5.1%,) while onlays had the highest (15.1%). Patients with pain/sensitivity (n=22), periapical pathology (n=16), or endodontic access (n=9) had significantly higher proportion of failures, while patients with occlusion issues (n=15) had lower and treatment was adjustment (n=25). Patients with periapical pathology (n=11) or endodontic access (n=9) had endodontic treatment without remake. Patients with pain/sensitivity were treated with occlusal adjustments (n=15) or endodontic treatment without remake (n = 15). Only patients with occlusion issues returned sooner (n=140 days) compared to others (188-618 days). Type of restoration showed no effect on return time (variable 4).

Conclusion: Digitally generated crowns had the highest success rate compared to other restorations. Restoration failures were attributed to pain/sensitivity or periapical pathology and treatment rendered were occlusal adjustment or endodontic treatment. Patients with heavy occlusion returned the soonest. The Digital Dentistry program can use these results to improve the curriculum and patient care.

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