

THE IMPACT OF DIGITAL WORKFLOW ON THE ACCURACY OF FIXED PROSTHODONTICS

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Abstract: Digital dentistry has revolutionized the fabrication of crowns and bridges. This thesis explores the comparative accuracy between conventional impressions and intraoral scanning. The research focuses on marginal fit and patient satisfaction.

Keywords: CAD/CAM, Intraoral Scanning, Prosthodontics, Marginal Fit, Digital Dentistry.

Introduction

The transition from analog to digital workflows in prosthodontics aims to minimize human error and enhance patient comfort. While traditional polyvinyl siloxane impressions are the "gold standard," intraoral scanners (IOS) claim to provide comparable, if not superior, precision.

Methodology

Thirty single-unit crowns were fabricated for fifteen patients. For each patient, one impression was taken using high-precision silicone, and another using an 3Shape TRIOS intraoral scanner. The marginal gap was measured using a scanning electron microscope (SEM) after the laboratory phase.

Results

The mean marginal gap for digital impressions was $45 \pm 10 \mu\text{m}$, whereas conventional impressions showed a gap of $62 \pm 15 \mu\text{m}$. Patients overwhelmingly preferred the digital scan due to the absence of the gag reflex and shorter chair time. Furthermore, the laboratory turnaround time was reduced by 30%.

Conclusion

Digital workflows in prosthodontics provide high accuracy that meets clinical requirements for fixed restorations. Beyond technical precision, the digital

approach enhances the patient experience and streamlines the communication between the clinic and the dental laboratory.

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