Egyptian Prosthodontic Association (EPA Newsletter)

POST-SPACE DIGITAL IMPRESSIONS

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THE POTENTIAL TO REPLACE TRADITIONAL IMPRESSION WORKFLOWS

1. The shift from conventional impression techniques to digital dental impressions represents a major paradigm change in contemporary prosthodontics. Digital workflows have introduced improved accuracy, efficiency, and predictability—particularly in the fabrication of customized post and core restorations.

2. Customized post and core restorations produced through direct intraoral scanning of the post space demonstrate superior control of cement thickness when compared with restorations fabricated from scanned conventional impressions. Direct intraoral scanning allows precise capture of the prepared root canal geometry, including fine anatomical details and undercuts, resulting in a highly accurate digital model.

Indirect (Semi-Digital) Workflows

Several indirect digital workflows have been described:

1. Scanning of a wax or resin pattern or a post-space impression, followed by virtual design and milling or printing of the post and core.This technique reduces chairside time and improves work efficiency compared with direct acrylic resin pattern fabrication. . *Al-Qarni, (2022)*

2. Scanning of a scannable stone cast, obtained from a post-space impression, followed by digital design and CAD/CAM milling.

Studies have demonstrated that CAD/CAM post and core restorations fabricated using various indirect workflows—whether by scanning a resin pattern, a cast, or a direct impression—show comparable adaptation values within clinically acceptable limits. *Perucelli et al, in (2021),*

Intraoral Scanning (IOS)Technologies

Current intraoral scanner (IOS) technologies include:

- Three-dimensional (3D) reconstruction
- Confocal imaging
- Active triangulation
- Optical coherence tomography
- Active wavefront sampling

These technologies contribute to enhanced accuracy and reliability in capturing complex intraoral geometries. *Fratila A M, et al, (2025).*

Advantages of the Fully Digital (Direct) Technique

The fully digital workflow—based on direct intraoral optical scanning of the post space—offers multiple advantages:

1. Reduced chairside time
2. Simplified laboratory procedures for post and core fabrication
3. Elimination of inaccuracies related to impression materials, gypsum casts, and pattern materials (resin or wax) *Leven et al., (2022).*
4. Improved marginal and internal adaptation of milled post and core restorations
5. Increased post retention
6. Improved control of cement thickness
7. Reduced nanoleakage
8. A faster and more user-friendly clinical approach. (*Tsintsadze et al., (2018).*

DIGITAL WORKFLOW

1. Case Selection

Treatment decisions and restorative strategies should be based on the most up-to-date materials and evidence-based protocols. *D. R. Falcão Spina et al (2018).*

2. Endodontic Treatment

Access cavity preparation is performed using carbide round burs. Canal instrumentation is carried out with an engine-driven rotary nickel-titanium (NiTi) system using a crown-down technique, with apical preparation up to a 2° taper and a final diameter of 0.4 mm. . *Y. Abdo, (2023).*

3. Post-Space Preparation

Gutta-percha is removed from the root canal using Gates-Glidden drills (sizes 2, 3, and 4) to the desired depth, measured from the coronal reference point. Final post-space preparation is completed using piezoelectric drills (sizes 3–4). Preparation accuracy is verified radiographically. . *A. Hamdy, (2017).*

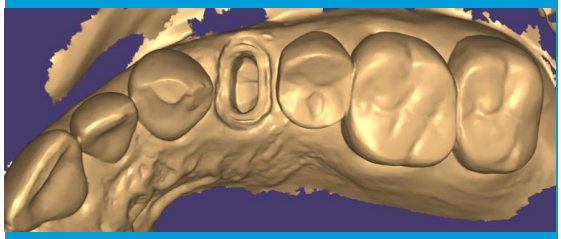

Figure 1: High quality digital impression

4. Post-Space Scanning

The prepared and flared post space is directly scanned intraorally using an IOS according to the manufacturer's instructions. Proper scanner calibration and isolation are essential to ensure accurate digital capture. . *A. Hegazi, et al (2022).*

Direct Digital Impression and CAD/CAM Fabrication

The fully digital workflow involves direct optical intraoral impression of the post space, followed by virtual restoration design and CAD/CAM milling.

Modern scanners offer deep scanning capabilities of up to 20 mm, high accuracy, easy handling, and excellent hygienic safety. These scanners acquire images using structured light without the need for powder application, producing high-precision digital impressions with exceptional image quality. Figure 1, *Jivănescu et al., (2021) & Amira S. Mahmoud et al. (2024).*

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