THE JOURNAL OF PROSTHETIC DENTISTRY

DENTAL TECHNIQUE

An implant impression technique involving abutment transition from interim prostheses to definitive restorations in the esthetic zone

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ABSTRACT

This article presents an impression technique involving transfer of the position of implants and the emergence profile of splinted interim prostheses fabricated on nonindexed interim abutments to definitive single crowns fabricated on indexed abutments. (J Prosthet Dent 2019;121:561-5)

An immediate implant replacement may have insufficient initial stability because of the limited residual bone in fresh extraction sockets.[1-3] Particularly in the anterior maxilla, mechanical leverage over the bone-implant interface is greater with immediate placement because of the palatal positioning.[4] In this situation, a 1-piece splinted screw-retained interim prosthesis may be feasible for multiple adjacent implant-supported prostheses or short-span implant-supported fixed partial dentures. Stabilization of the implants with a splinted interim prosthesis reduces the unfavorable occlusal load distribution and increases the initial stability of the implants.[5]

One-piece splinted screw-retained interim prostheses constructed on nonindexed (NI) abutments allow for the flexibility of implants placed in nonparallel positions, as index-free abutments can be seated in any rotational position.[6,7] Thus, fabricating 1-piece splinted interim prosthesis on NI abutments ensures their fit with implants and maintains the soft-tissue profile of natural teeth[8,9] after immediate placement of multiple adjacent implants.

When proceeding to definitive restorations, fabricating single crowns on indexed abutments for adjacent implants as independent units improves the long-term integrity of the implant abutment junction, and single restorations provide enhanced access for interproximal hygiene and improved esthetics.[10,11] Thus, at the definitive impression appointment, transferring the position of

Figure 1. Preoperative intraoral view.

Support provided by New Clinical Technology Program of Peking University Hospital and Stomatology with the grant PKUSSNCT-16A11.

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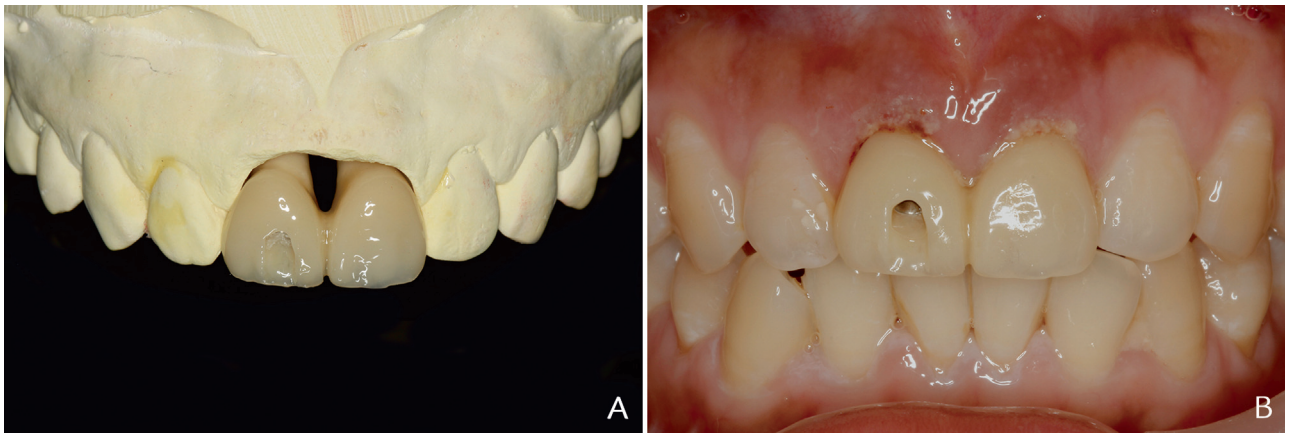

Figure 2. One-piece splinted interim prosthesis. A, On cast. B, Intraorally.

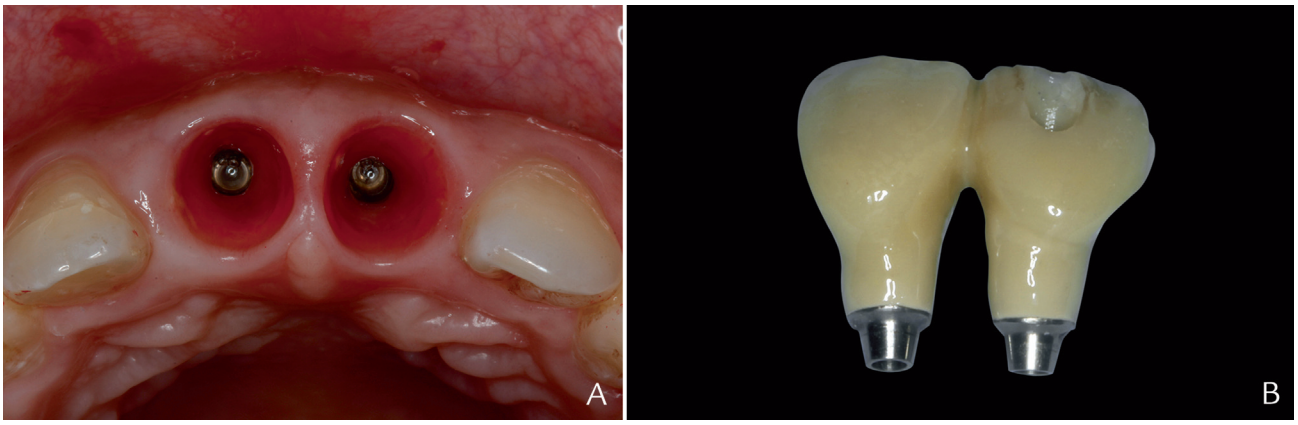

Figure 3. A, Matured soft-tissue emergence profile. B, One-piece interim prostheses on NI abutments. NI, nonindexed.

implants and the emergence profile of 1-piece interim splinted prosthesis to definitive single crowns using antirotational indexed abutments becomes a key issue.

A commonly used method is fabricating a custom impression coping.[11-13] In a conventional fabrication procedure, the mating of analogs and interim splinted prostheses with NI abutments may occur with various spatial relations; therefore, impression copings will rotate at different angles, and accurate fit cannot be ensured.

The technique described involves transferring the position of implants and the emergence profile of 1-piece interim splinted prosthesis on NI interim abutments to definitive single crowns on indexed original titanium abutments bonded to individualized zirconia copings.

TECHNIQUE

1. Evaluate the tissue around 2 unfavorable fractured incisors for signs or symptoms of pathosis (Fig. 1). After flapless extraction of 2 maxillary central incisors, immediately place 2 implants (Astra; Dentsply Sirona) with a primary stability of 35 Ncm.
2. Fabricate a 1-piece splinted screw-retained interim prosthesis from a composite resin (Ceramage; Shofu) on 2 NI interim abutments (Astra; Dentsply Sirona) and fit them intraorally later the same day (Fig. 2). Remove as many centric or eccentric occlusal contacts as possible.
3. Leave the interim prostheses in place for 6 months. Then, remove the interim prostheses and assess the emergence profile (Fig. 3). Connect 2 long indexed impression copings that capture the internal antirotational feature of the implants. Splint 2 copings intraorally using light-polymerized resin (Dentona gel LC; Dentona AG) (Fig. 4A).
4. Remove the splinted impression copings from the mouth and securely fit 2 coping analogs. Place autopolymerizing composite resin (Protemp 4; 3M ESPE) around the 2 analogs (Fig. 4B). Fit the interim prostheses to the splinted analogs (Fig. 4C). Push the interim prosthesis-analog combination into well-mixed laboratory impression putty (Rapid Putty soft; Coltène) and adapt the putty slightly above the gingival margin of the crowns (Fig. 4D). After the putty has polymerized, unscrew and

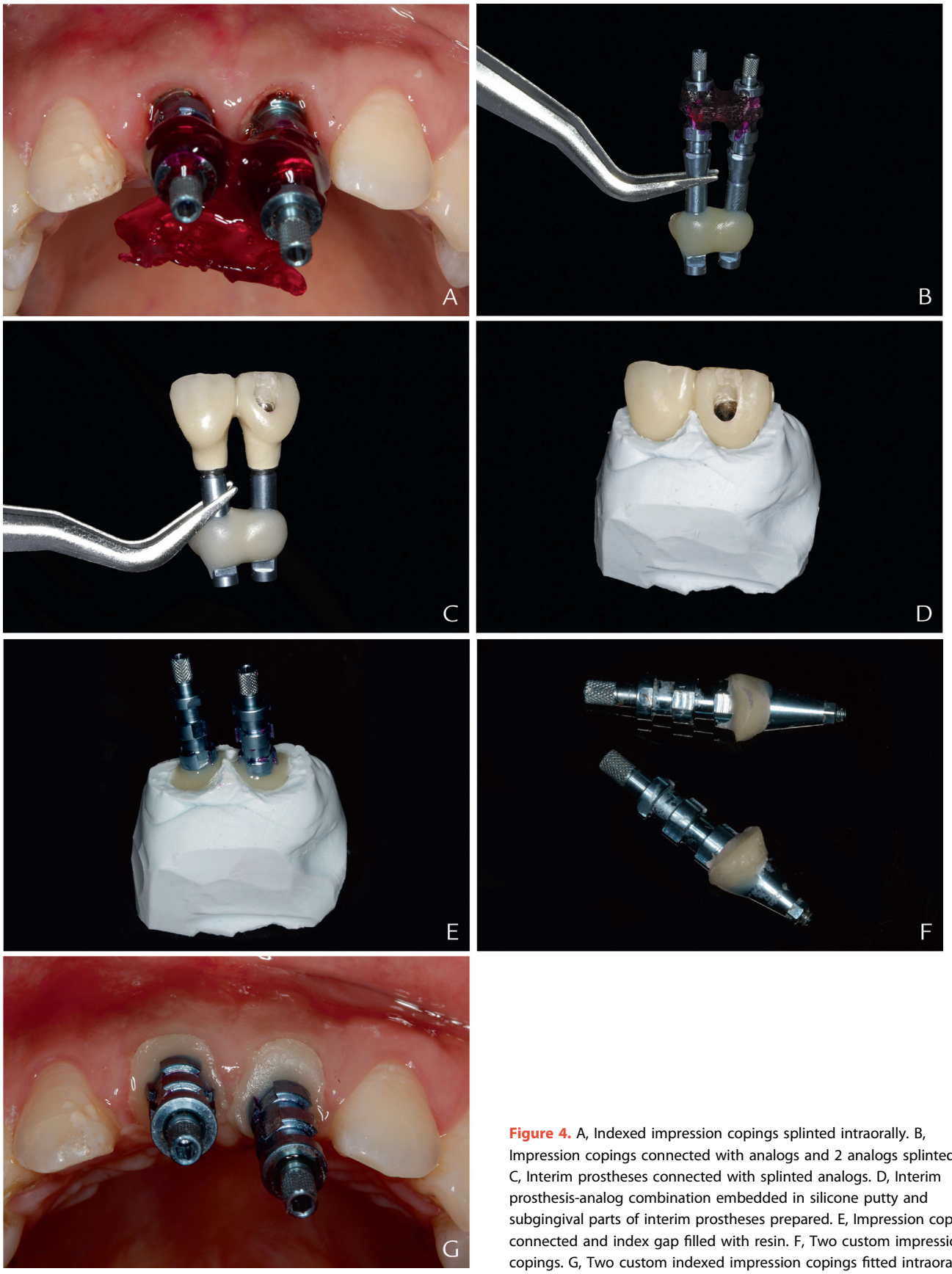

Figure 4. A, Indexed impression copings splinted intraorally. B, Impression copings connected with analogs and 2 analogs splinted. C, Interim prostheses connected with splinted analogs. D, Interim prosthesis-analog combination embedded in silicone putty and subgingival parts of interim prostheses prepared. E, Impression copings connected and index gap filled with resin. F, Two custom impression copings. G, Two custom indexed impression copings fitted intraorally.

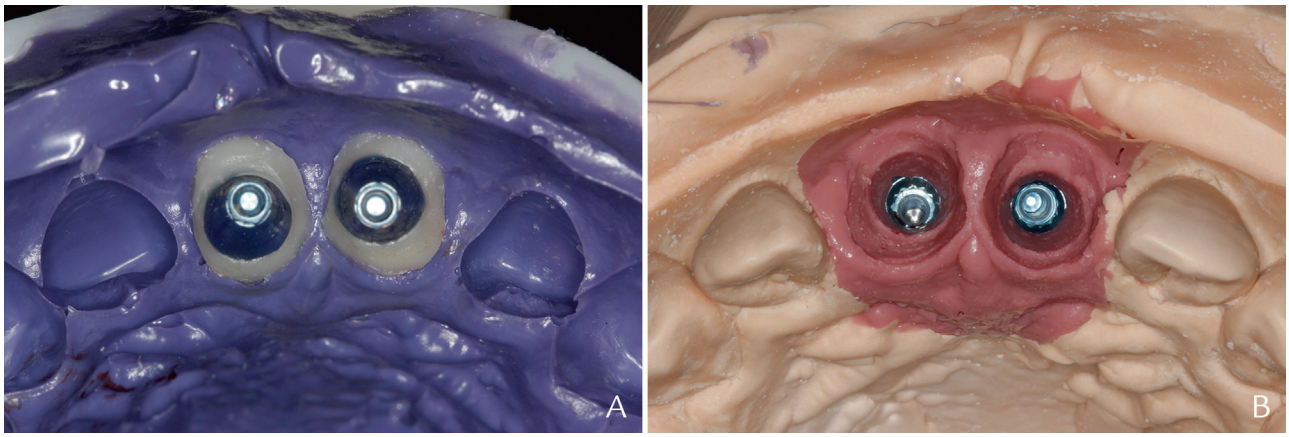

Figure 5. A, Polyether impression using open-tray technique. B, Definitive cast with removable artificial gingiva material.

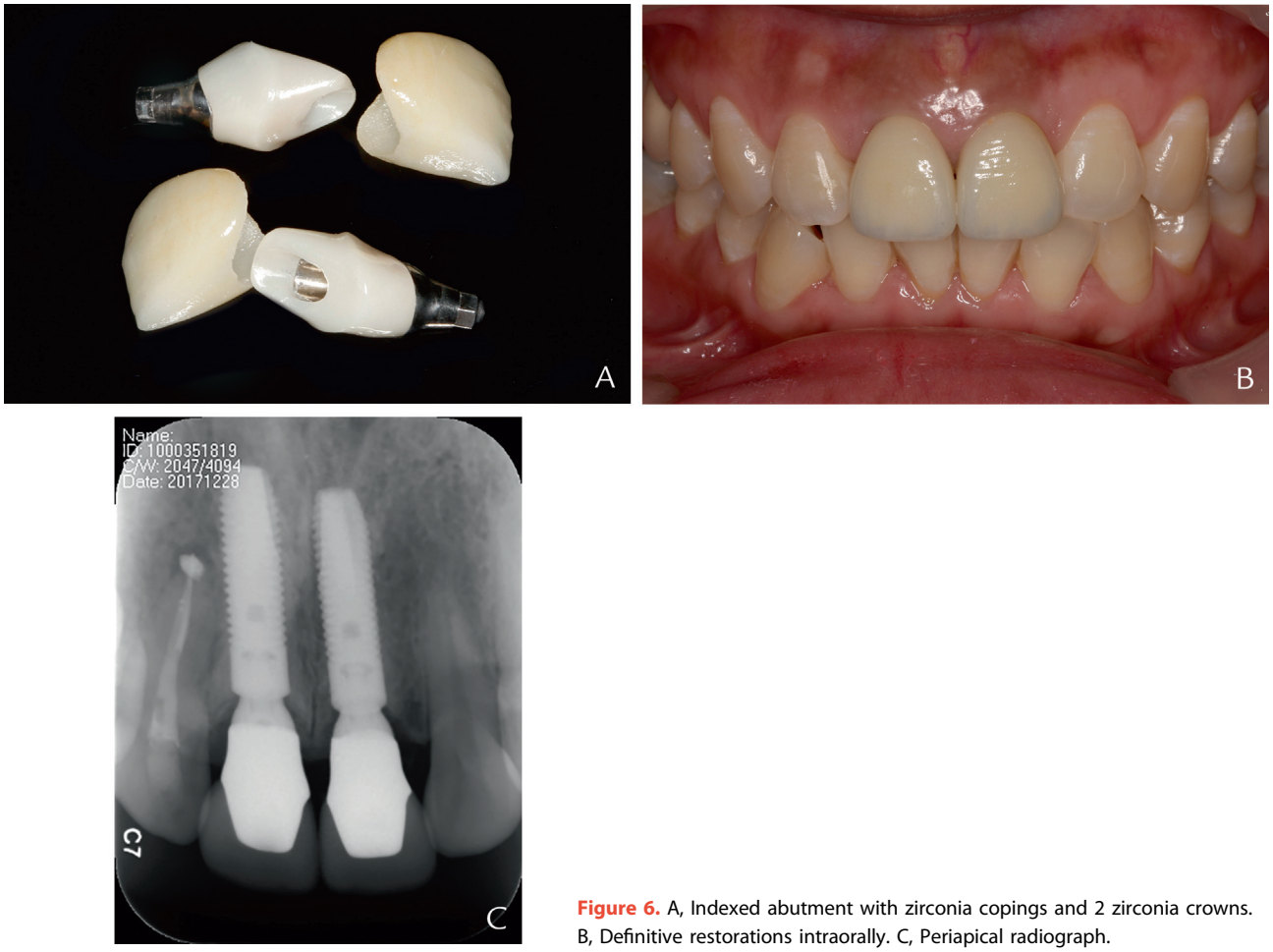

Figure 6. A, Indexed abutment with zirconia copings and 2 zirconia crowns. B, Definitive restorations intraorally. C, Periapical radiograph.

remove the interim prostheses. Refit 2 separate indexed impression copings inside the silicone putty and fill the gap with flowable light-polymerized composite resin (Beautifil Flow; Shofu) (Fig. 4E).

5. Remove the 2 indexed custom impression copings from the putty (Fig. 4F). After trimming excess composite resin, insert the copings into the implant body and engage the antirotational feature (Fig. 4G).
6. Make the definitive impression using a polyether impression material (Impregum; 3M ESPE) with the open-tray technique (Fig. 5A). Refit the implant

analogs to the impression copings and fabricate the definitive stone cast using soft-tissue simulation (Fig. 5B).
7. Fabricate the definitive restorations. Modify 2 indexed original titanium abutments (Astra; Dentsply Sirona) and bond them to individual zirconia copings. Then, design and fabricate 2 single zirconia crowns (Lava Plus Zirconia; 3M ESPE) (Fig. 6A).
8. Place the definitive restorations intraorally to complete the restoration procedure (Fig. 6B). Confirm the occlusion, proximal contacts, and esthetics. The periapical radiograph shows the passive fit of the 2 crowns (Fig. 6C)

DISCUSSION

Splinting multiple single-unit implants during impression making can register the relationship between implants in a rigid fashion.[14] Also, splinting impression copings intraorally and connecting them with analogs extraorally determines the spatial relations of the analogs. Then, connecting the interim splinted prostheses with analogs extraorally makes it possible to record both the position of the implants and the emergence profile of the interim prostheses. The 3 steps of splinting and connection achieved transition from connected abutments to crown abutments for definitive restorations.

Conventional indirect impression transfer techniques cannot determine the positions of the analogs when purely connected with interim splinted prostheses on NI abutments. Various techniques have been proposed to record the positions of multiple adjacent implants and duplicate the soft-tissue contours.[15-17] The direct technique uses the refined interim restoration to record the peri-implant tissue forms.[16-18] However, the direct technique involves pouring the definitive cast immediately after making the impression, which delays the return of the interim prostheses to the patient. The digital technique offers an alternative methodology. It records peri-implant soft-tissue contours and implant positions in 3 dimensions within a merged digital scan.[19] However, digital scans are limited by the line of sight during scanning and the accuracy of the superimposition of digital casts.[20] This modified indirect impression technique offers a straightforward and rapid solution at the definitive impression session for multiple adjacent implant-supported prostheses or short-span implant-supported fixed partial dentures.

SUMMARY

This technique described here is a straightforward and rapid means of transferring the position of implants and the emergence profile of interim prostheses and implementing abutment transitions.

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Acknowledgments
The authors thank Qiao Wang from Dental Laboratory of Department of Prosthodontics, Peking University School and Hospital of Stomatology, for her assistance.

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https://doi.org/10.1016/j.prosdent.2018.06.018