THE JOURNAL OF PROSTHETIC DENTISTRY

DENTAL TECHNIQUE

Adhesive residue on the CAD-CAM surgical guide sleeve: A technical report

Phillip Roe, DDS, MS,[a] Kitichai Rungcharassaeng, DDS, MS,[b] Joseph Y. Kan, DDS, MS,[c] and Armand Putra, BDS, MSD[d]

ABSTRACT

Computer-aided design and computer-aided manufacturing (CAD-CAM) surgical guides can be used by the clinician and dental technician to create a definitive cast before surgery, thereby allowing an indirect interim restoration to be fabricated. However, the accurate transfer of the interim restoration from the laboratory to the surgical site requires a precise interface between components. This article reports the prosthetic significance of adhesive residue on the intaglio surface of the CAD-CAM surgical guide sleeve, which can create errors in the implant analog position of the definitive cast. A technique for identifying the presence of residue and its careful removal are also introduced. (J Prosthet Dent 2019;121:746-8)

For many years, 3-dimensional (3D) data from computed tomography have provided essential information (bone volume and vital structures), thereby improving treatment planning.[1] Today, computer-guided surgery has allowed clinicians to virtually plan implant positions based on the proposed prosthetic design, using computed tomography data along with computer-aided design and computer-aided manufacturing (CAD-CAM) and treatment planning software.[2] Because CAD-CAM surgical guides can precisely control implant placement in 3D, an indirect interim restoration can also be fabricated before implant surgery.[3,4]

A key component in the CAD-CAM surgical guide (NobelGuide; Nobel Biocare) armamentarium that facilitates this process is the guided cylinder with pin (Guided Cylinder with Pin; Nobel Biocare) assembly. This laboratory component helps to maintain a geometric relationship between the surgical guided sleeve and the implant analog, which allows the clinician and technician to produce a definitive cast for the fabrication of an indirect interim restoration. Vertical accuracy of the implant position, however, relies on the complete adaptation of the laboratory components to the guide sleeve.

The purpose of this article was to discuss the prosthetic significance of adhesive residue on the intaglio surface of the surgical guide sleeve. A straightforward technique is introduced for identifying and removing any adhesive residue.

TECHNIQUE

The following is a technique for identifying and removing any adhesive residue:

1. Verify the fit of the surgical guide to the teeth on the original cast to ensure complete adaptation.
2. Inspect the intaglio surface of the surgical guide sleeve for traces of adhesive residue under magnification (Fig. 1). When adhesive residue is not apparent, attach the laboratory components to the surgical guide sleeve and evaluate the degree of component adaptation (Fig. 2). If this interface is not accessible to visual inspection, use a radiograph to confirm adaptation (Fig. 3).

[a]Assistant Professor, Department of Restorative Dentistry, Loma Linda University School of Dentistry, Loma Linda, Calif, and Private practice, Edmonds, Wash.
[b]Professor, Department of Orthodontics and Dentofacial Orthopedics, Loma Linda University School of Dentistry, Loma Linda, Calif.
[c]Professor, Department of Restorative Dentistry, Loma Linda University School of Dentistry, Loma Linda, Calif.
[d]Fellow, Advanced Education in Implant Dentistry, Loma Linda University School of Dentistry, Loma Linda, Calif.

Figure 1. Adhesive residue on intaglio surfaces of surgical guide sleeves.

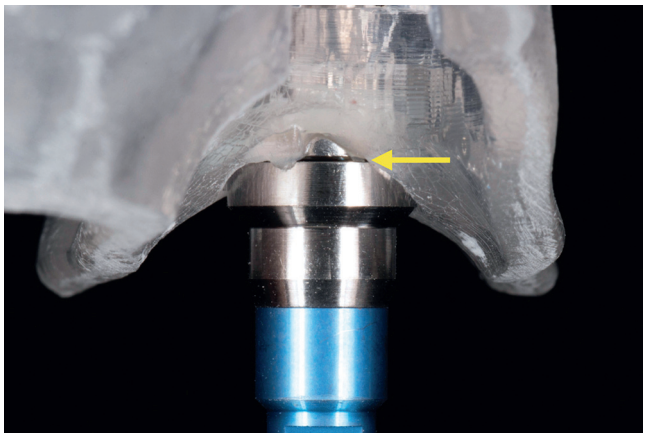

Figure 2. Incomplete adaptation of laboratory components to surgical guide sleeve.

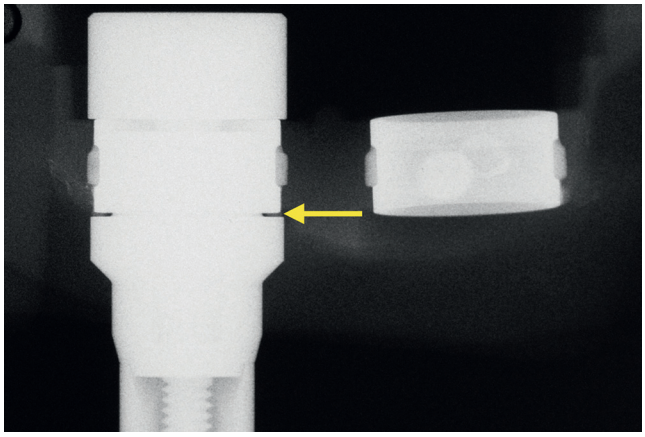

Figure 3. Radiograph confirming incomplete adaptation.

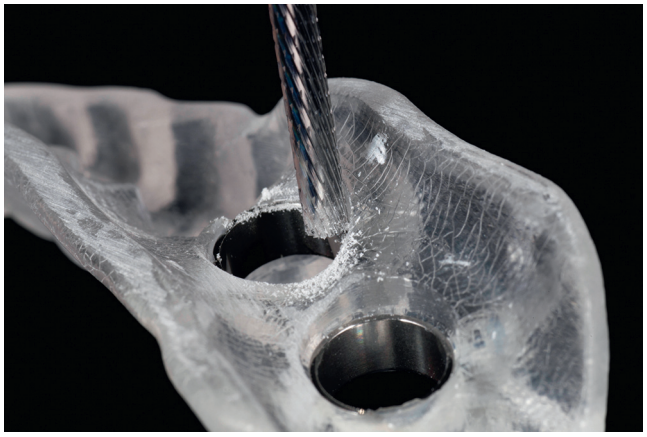

Figure 4. Careful preparation of surgical guide adjacent to surgical guide sleeves.

Figure 5. Adhesive residue removed from guide sleeve with carver.

Figure 6. Intaglio surface of surgical guide sleeves after removing adhesive residue.

3. Remove residue by preparing the walls of the surgical guide adjacent to the guide sleeve with a side-cutting, flat, non-cutting, end carbide rotary instrument (H364E; Komet USA) at 1000 to 2000 rpm to offset the guide wall approximately 0.75 to 1.0 mm from the guide sleeve (Fig. 4). This offset will ensure that the laboratory components will not bind to the wall of the surgical guide.

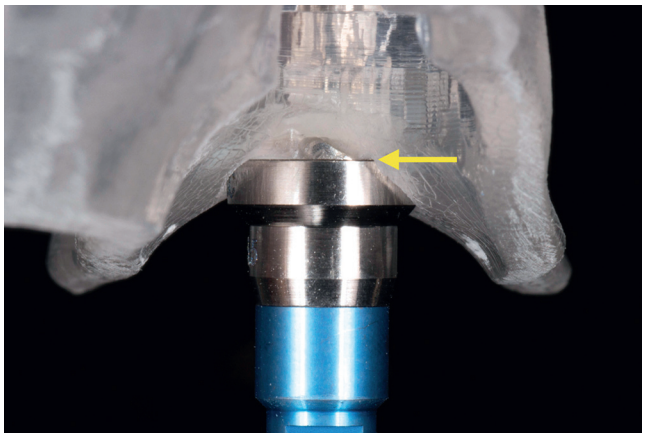

Figure 7. Complete adaptation of laboratory components to surgical guide sleeve.

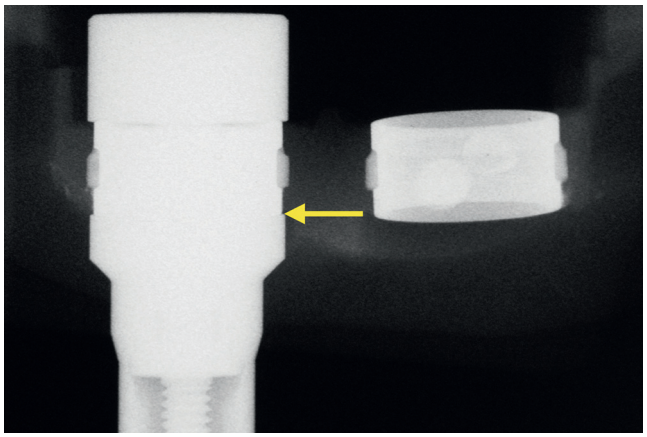

Figure 8. Radiograph confirming complete adaptation.

4. Use a sharp hand instrument (½ Discoid-Cleoid Carver; Hu-Friedy) to remove the adhesive residue on the intaglio surface of the guide sleeve (Fig. 5).
5. After selective adjustments have been made to the surgical guide, the intaglio surface of the surgical guide sleeve should be clear of adhesive residue (Fig. 6).
6. Verify complete adaptation of the laboratory components to the intaglio surface of the surgical guide sleeve visually or with a radiograph (Figs. 7, 8).

DISCUSSION

Placement of a dental implant in the correct position is necessary for both esthetic and functional outcomes of the subsequent restoration.[5] The advent of the CAD-CAM surgical guide has improved the predictability of the surgical placement of implants, significantly increasing accuracy compared with conventional implant placement.[6] These CAD-CAM surgical guides can also be used by the clinician or technician to create a definitive cast, thereby allowing an indirect interim restoration to be fabricated before the surgery.[4] The benefits of an indirect interim restoration include an overall increase in material strength and therefore a reduction in prosthetic complications during the healing phase. In addition, it serves to minimize the time involved in chairside reline procedures and/or adjustments. A precise interface between laboratory components is essential to the fabrication of the definitive cast and the success of the subsequent interim restoration. Adhesive residue on the intaglio surface of the surgical guide sleeve can create a disparity between the spatial orientation of the implant analog in the definitive cast and the implant in the clinical situation. These disparities would result in vertical discrepancy between the laboratory fabrication and clinical placement of the immediate interim restoration and should be minimized or eliminated.

SUMMARY

Adjusting the CAD-CAM surgical guide to ensure complete adaptation of the laboratory components to the surgical sleeve is a straightforward procedure requiring little time and a basic armamentarium. The described selective adjustments will ensure complete removal of the adhesive residue, producing an accurate definitive cast from which the indirect interim restoration can be fabricated.

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Corresponding author:
Dr Phillip Roe
21701 76th Avenue W, Suite 204
Edmonds, WA 98026
Email: philroe@icloud.com

https://doi.org/10.1016/j.prosdent.2018.03.010