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Clinical Technique

Verifying Occlusal Reduction During Tooth Preparation

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Obviously, it is important to obtain and verify adequate occlusal reduction during tooth preparation. Failure to do so can lead to a number of potential problems. The resultant restoration may be difficult for the technician to fabricate easily with an appropriate functional and esthetic occlusal surface. The restoration may be thin and/or weak as a result of the thickness itself or attempts by the clinician to equilibrate high spots prior to luting. Over time, inadequate thickness in excursive areas may lead to occlusal wear and loss of integrity (ie, holes).

Attempts by clinicians to verify adequate occlusal reduction usually rely on visual assessment, which can be inaccurate. Occlusal guides such as leaf gauges or tabs of known thickness are sometimes used (Figure 1) but do not always easily reveal the exact location of inadequate reduction on the occlusal surface. Since many clinicians like to accomplish occlusal reduction as a first step in crown preparation, this can be a problem as it is not as easy to judge the reduction when the axial surfaces have not been prepared.

The technique described here is quick and reliable and requires no special equipment or instrumentation but allows the clinician to verify adequate occlusal reduction in centric occlusion as well as excursive movements.

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OCCLUSAL REDUCTION AND VERIFICATION TECHNIQUE

Proper occlusal reduction is accomplished by clinicians in a variety of ways with the aid of depth cuts, hemi-prep techniques, and reduction matrices. Once the initial occlusal reduction is made, a visual inspection with the teeth in centric occlusion is used to verify the result. Unfortunately, limited access intraorally can lead to a discrepancy between what actually exists and the amount of reduction the technician needs. Once the occlusal reduction is finished, the remainder of the preparation is completed (axial reduction and margination) without further verification of the occlusal reduction. Therefore, it is important to verify the reduction at the initial stage of preparation or as the last step in the process.

Using blue periphery wax (Sturgident Periphery Wax, Heraeus Kulzer LLC), a small ball of wax is

Figure 1. *Various products that can be used to aid in the assessment of occlusal reduction.*

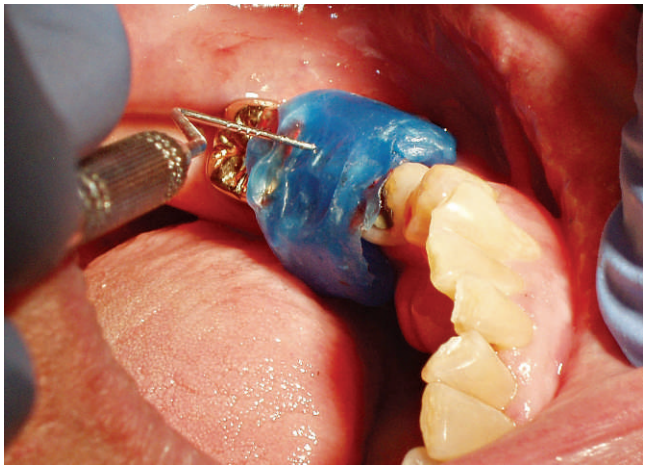

Figure 2. *Through a functionally generated wax index, a periodontal probe is used to check for minimally reduced areas.*

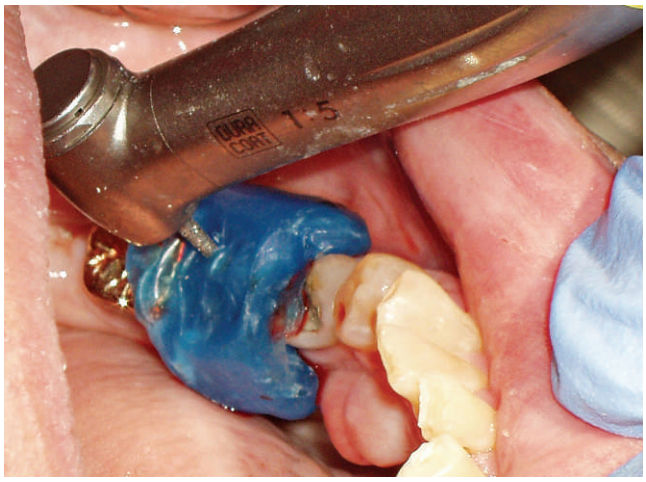

Figure 3. *Through the wax index, a diamond bur is used to create a divot in the exact spot on the prepared tooth deemed to have inadequate occlusal reduction.*

placed over the tooth and the patient is instructed to close together into centric occlusion. Many clinicians use this (or similar techniques) to check centric occlusion clearance. The wax is removed from the mouth to inspect for thin spots. An approximation is made regarding the area needing the reduction, and the process is repeated. An inherent problem is trying to estimate exactly where this under-reduced area is once the wax is out of the mouth.

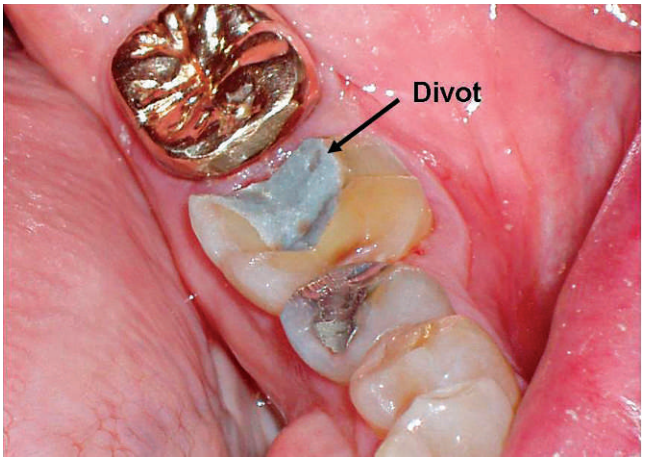

Figure 4. *Wax index is removed and the area needing more reduction is clearly marked.*

In the technique advocated here, after closing into the wax in centric occlusion, the patient is then guided through excursive movements, which produces a functionally generated wax index over the teeth (Figure 2). Without removing the wax from the mouth, a periodontal probe (Williams periodontal probe - Hu-Friedy) with millimeters marked in black is used to test and identify areas of minimal reduction. A rounded-end diamond burr (Brassler 856-018) that is used for occlusal reduction is used (through the wax) to create a divot approximately the depth needed for additional reduction (Figure 3). The wax is removed from the mouth, and the exact spot is identified for further reduction (Figure 4). Once accomplished, the remainder of the preparation can be completed with the assurance that excess adjustment of the restoration will not need to be done at the delivery appointment nor will the opposing dentition need to be altered.

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