DTP

DIGITAL TREATMENT PLANNING

DUAL-SCAN CT PROTOCOL

Glidewell Implant Solutions

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DUAL-SCAN CT PROTOCOL FOR FULLY EDENTULOUS CASES

In keeping with Glidewell's restorative-driven approach to implant treatment, it is crucial that digital treatment planning (DTP) cases are created to support the optimal prosthetic outcome. For fully edentulous cases, this requires adhering to the following **dual-arch computed tomography (CT) scan protocol** to ensure that guided surgical implant placement supports an optimal prosthetic design for the planned full-arch restoration.

Material Requirements

- ☑ The patient's well-fitting existing prosthesis **or** a clear acrylic duplicate scan appliance
  Note: The denture must contain no metal or mesh. Wax rims are not acceptable.
- ☑ **Radiolucent** bite registration material
- ☑ Reline material (if existing prosthesis does not fit well; see Step 1 for recommended materials)
- ☑ Fiducial markers (radiopaque stickers or gutta-percha material)
- ☑ Block of foam or Styrofoam

Need help fabricating an acrylic duplicate scan appliance? See our online video tutorial.

glidewell.com/scan-appliance

Step 1: Denture Reline (If Necessary)

If your patient's existing denture is poor-fitting, it is crucial to perform a reline to ensure accurate fabrication and fit of the surgical guide on the soft tissue, and implant positioning that enables proper design, contours and function of the future restoration.

NOTE: To reline the denture, use a chairside hard-reline material or vinyl polysiloxane (VPS) material — Capture® medium body (Glidewell Direct; glidewelldirect.com) is recommended. If soft-reline or other materials are used, the radiodensity of these materials may require additional scans with a recommended material, which can delay your case.

1. Inject a reline material directly onto the intaglio surface of the patient's denture.
2. Guide the patient into proper occlusion and let the reline material set.
3. Remove the denture and trim any excess material from the denture's exterior surface.

Step 2: Bite Registration

A bite registration is needed to establish centric relation, to serve as a bite index to prevent the denture or duplicate scan appliance from moving during scanning, and to correctly position and fixate the surgical guide during guided surgical implant placement.

NOTE: A radiolucent bite registration material, such as Capture Clear Bite Registration (Glidewell Direct; glidewelldirect.com), must be used to ensure an accurate digital treatment plan. If wax or a radiopaque bite registration material is used, additional scans with radiolucent material may be requested, which can delay your case.

1. With the patient's denture or duplicate scan appliance in place, apply a thin layer of radiolucent bite registration material.
2. Guide the patient to close their mouth into centric occlusion and hold that position while the material is allowed to set.
3. Remove the bite registration and trim any excess material. The bite registration will serve as an index during CT scanning to prevent any movement of the denture or scan appliance.
4. Keep the bite registration for use during the surgical appointment to ensure the surgical guide is fully seated when securing the anchor pins of the surgical guide.

Step 3: Radiographic Markers

In order for the CT scan to fully capture the denture or scan appliance, radiographic markers must be added to the denture or scan appliance. For this purpose, use either gutta-percha material or artifact-free radiopaque markers (stickers) for dentures, such as Suremark DentalMark 2.0mm Visionline Ball on Denture Sized Labels.

NOTE: A and B are examples of gutta percha placement, and C and D are examples of radiopaque sticker placement.

Need help placing gutta-percha markers? See our online video tutorial.

glidewell.com/radiographic-markers

1. Apply radiopaque markers — using either stickers or gutta-percha material — to 6–8 different points along the denture or scan appliance. NOTE: Make sure to apply a minimum of 6 markers, including 2 per sextant.
2. Position the markers below the CEJ and avoid the occlusal plane, denture borders and intaglio surface.
3. If using gutta-percha material, create a 1-mm-deep hole with a round bur. Then, pack the gutta-percha material into the hole and ensure the material is flush with the denture's or scan appliance's surface.

Step 4: CT Scan of Denture or Scan Appliance Outside the Mouth

The first scan needed in the dual-arch protocol is taken of the denture or duplicate scan appliance outside the patient's mouth. Note that either a CT scan or CBCT scan is acceptable.

NOTE: Do not remove and replace radiographic markers in-between the scans.

1. Place the denture or scan appliance on a foam or Styrofoam block, so the denture will appear to be floating in space in the scan. *NOTE: Do not scan the denture or scan appliance sitting directly on the plastic stand of the CBCT scanner, which will interfere with the image.*
2. Position the denture or scan appliance in the center of the FOV, ensuring the intaglio surface is resting on the foam or Styrofoam block. If the patient was scanned before this step, it is important that the stickers are **not** removed between the patient scan and denture scan.
3. Scan the denture or scan appliance, using the standard parameters of approximately 0.4–0.5 mm slice thickness or following the dedicated denture scan protocol of the CBCT scanner.

Step 5: CT Scan of Patient

The second of the two scans needed for accurate digital treatment planning and surgical guide fabrication in full-arch cases is taken with the denture or scan appliance in the patient's mouth. Note that either a CT scan or CBCT (cone-beam computed tomography) scan is acceptable.

1. Seat the prepared and marked denture or duplicate scan appliance in the patient's mouth, using the bite registration prepared in Step 2 as an index to ensure correct positioning.
2. Instruct the patient to close their eyes and remain as still as possible during scanning.
3. Scan the patient with the denture and bite index in the mouth, using the standard parameters of approximately 0.4–0.5 mm slice thickness. NOTE: The FOV (field of view) for the maxilla should include opposing dentition to the base of the eye; the FOV for the mandible should include the entrance and exit of the inferior alveolar nerve.
4. Make sure the radiographic markers applied in Step 3 are visible in the scanner FOV, and confirm that the denture is seated properly.

Step 6: Data Transfer

To initiate your digital treatment planning and surgical guide fabrication case with Glidewell, the data must be transferred in uncompressed DICOM file format.

1. Export both scans in DICOM format, labeling scans accordingly as “Patient,” “Maxillary Denture,” or “Mandibular Denture.”
2. To initiate your first case and upload your scans, contact the Glidewell DTP team at 866-497-3692 or DTP@glidewelldental.com.

Notes

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