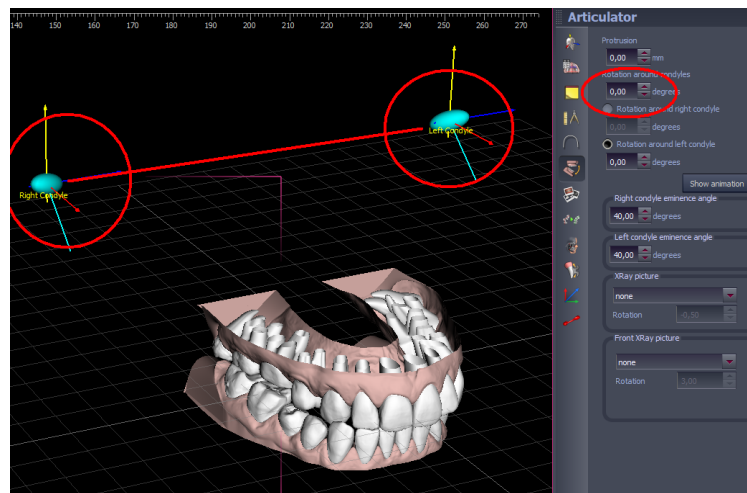


Methods for Determining the 3D Spatial Position of Condyles in DDP-Ortho Software Without a Facebow for First Occlusion Articulation

This article explores methods for defining the three-dimensional spatial position of condyles within the DDP-Ortho software. These methods do not require the use of a facebow and are intended to facilitate articulation in the first occlusal range, characterized by the rotation of the mandible around the condylar axis. The DDP-Ortho software enables mandibular articulation through rotation around the axis defined by the condyles, offering various approaches for inputting condylar positions.



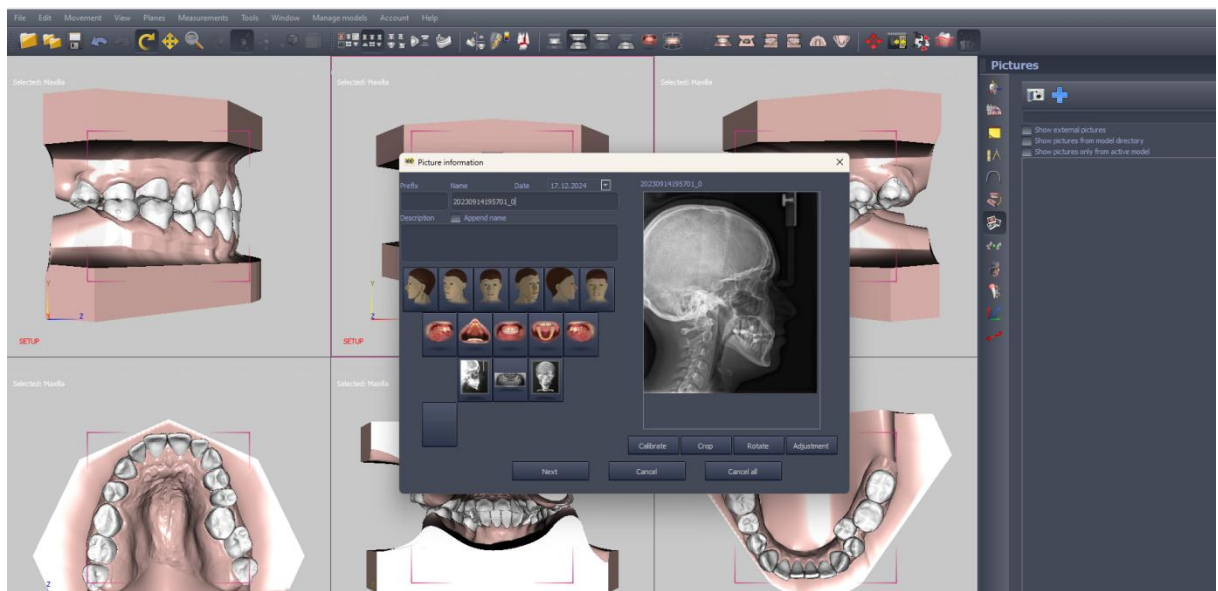
The DDP-Ortho software allows users to articulate the mandible by defining its rotation around an axis determined by the condyles. This process is critical for accurate occlusal analysis and simulation.

The following methods are available for specifying condylar positions in DDP-Ortho:

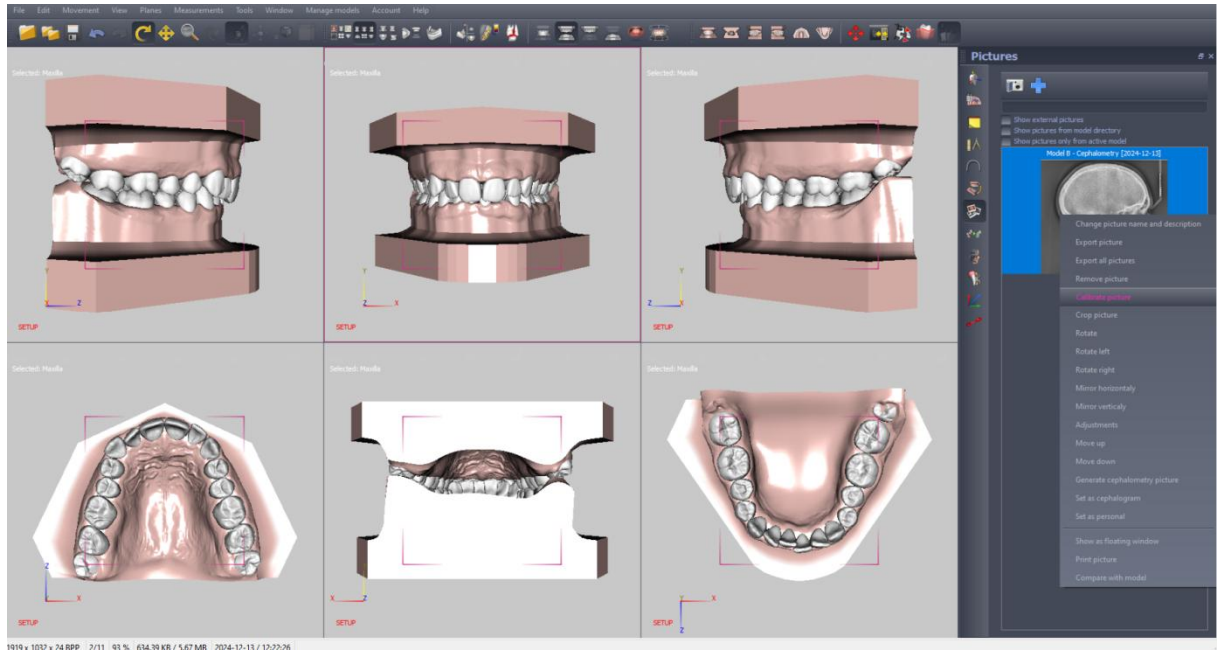
- Manual positioning: Based on the operator's decision.
- Axjoprisa integration: Using Axjoprisa software to aid condylar positioning.
- Radiographic data: Utilizing cephalometric and PA X-ray images.

1. Procedure for Condylar Positioning Using X-Ray Images.

1.1. Importing Images:

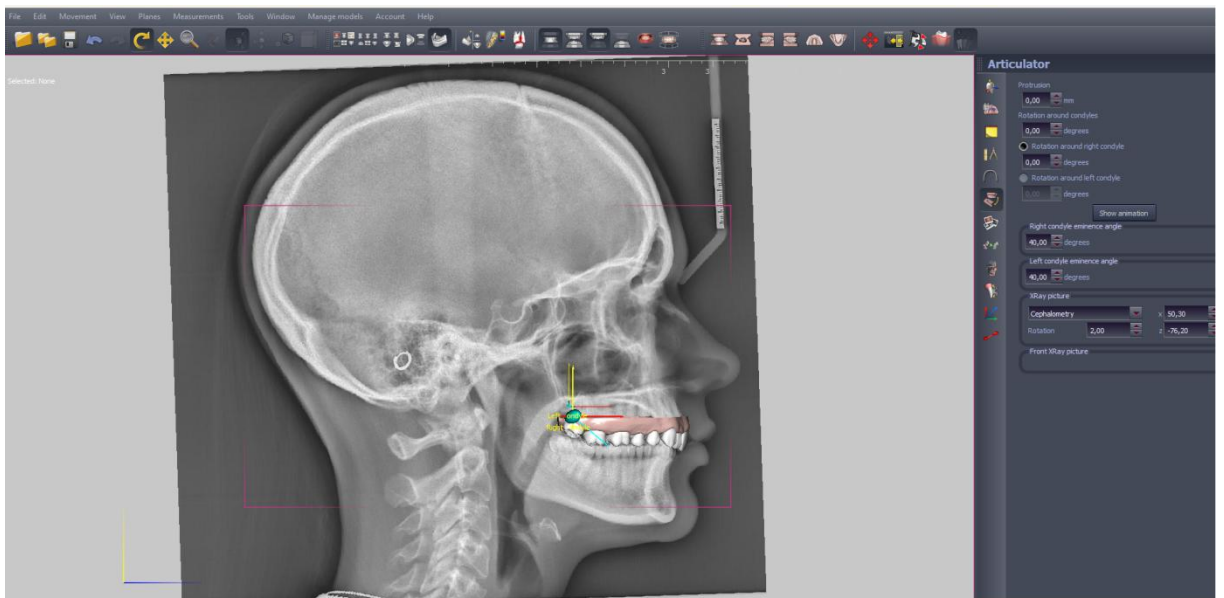
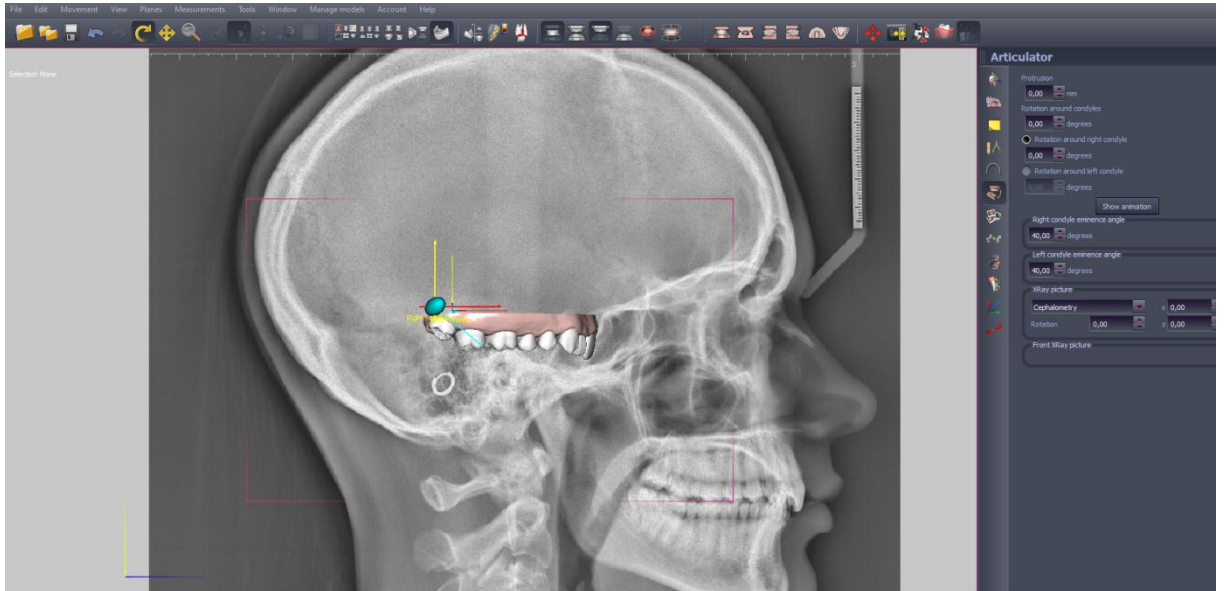


1.2. X-ray images are imported into DDP-Ortho, followed by calibration to match the scale of the virtual model.



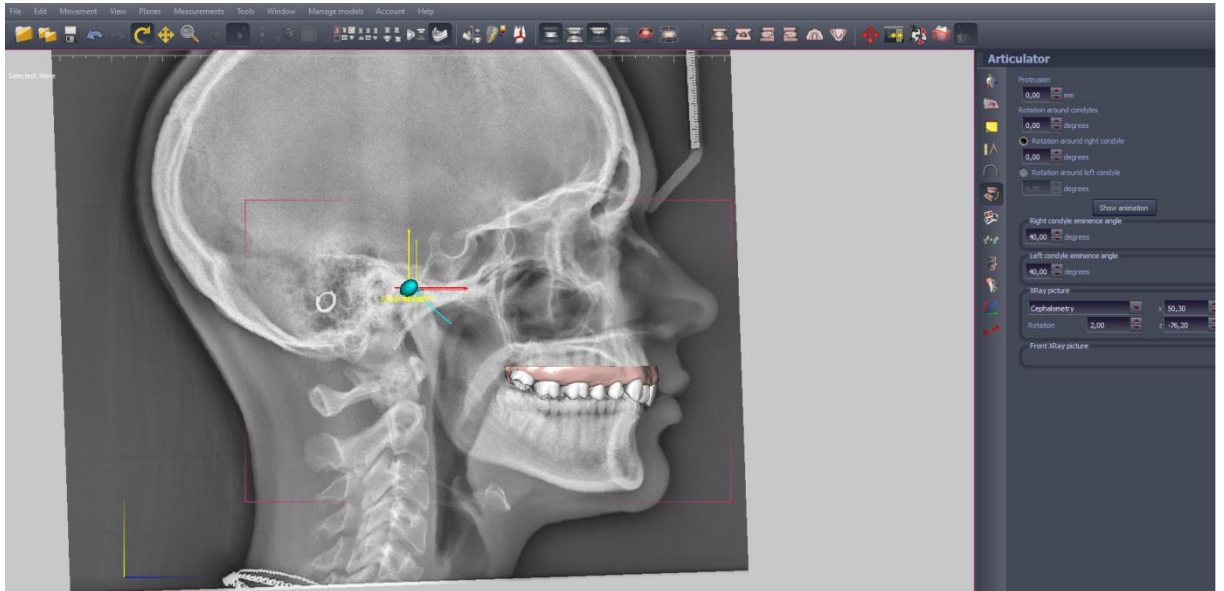
1.3. Image Alignment.

The X-ray images are aligned with the virtual model, enabling the operator to interpret condylar positions directly from the radiographs.



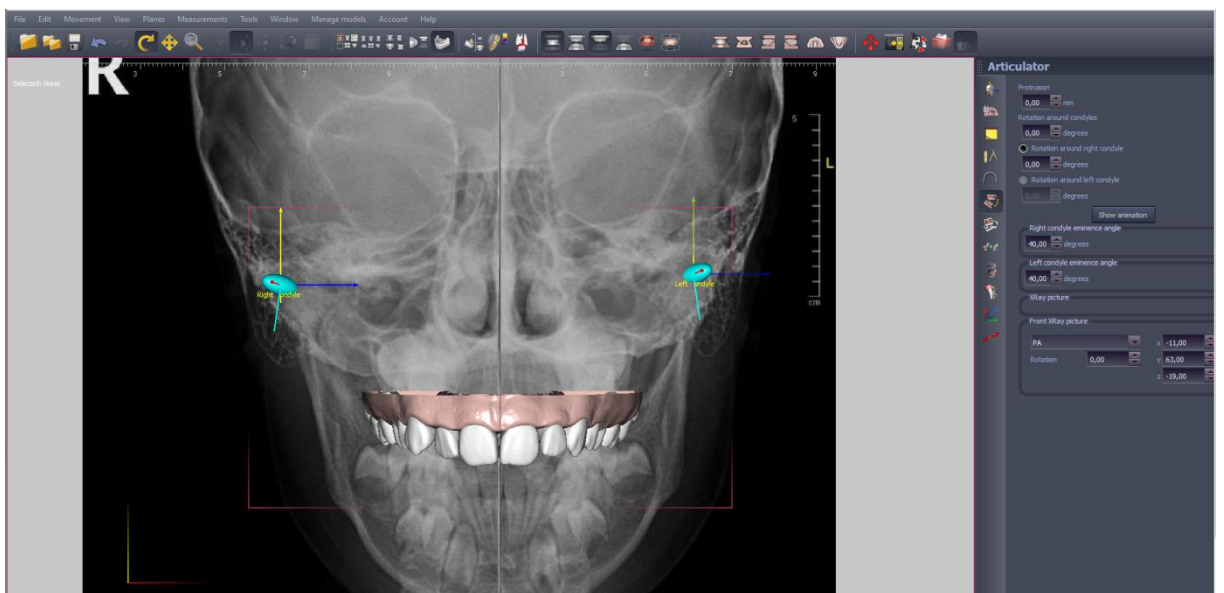
1.4. Condylar Positioning in the Lateral View.

Using cephalometric images, the condyles are positioned in the lateral view to align with their observed anatomical location



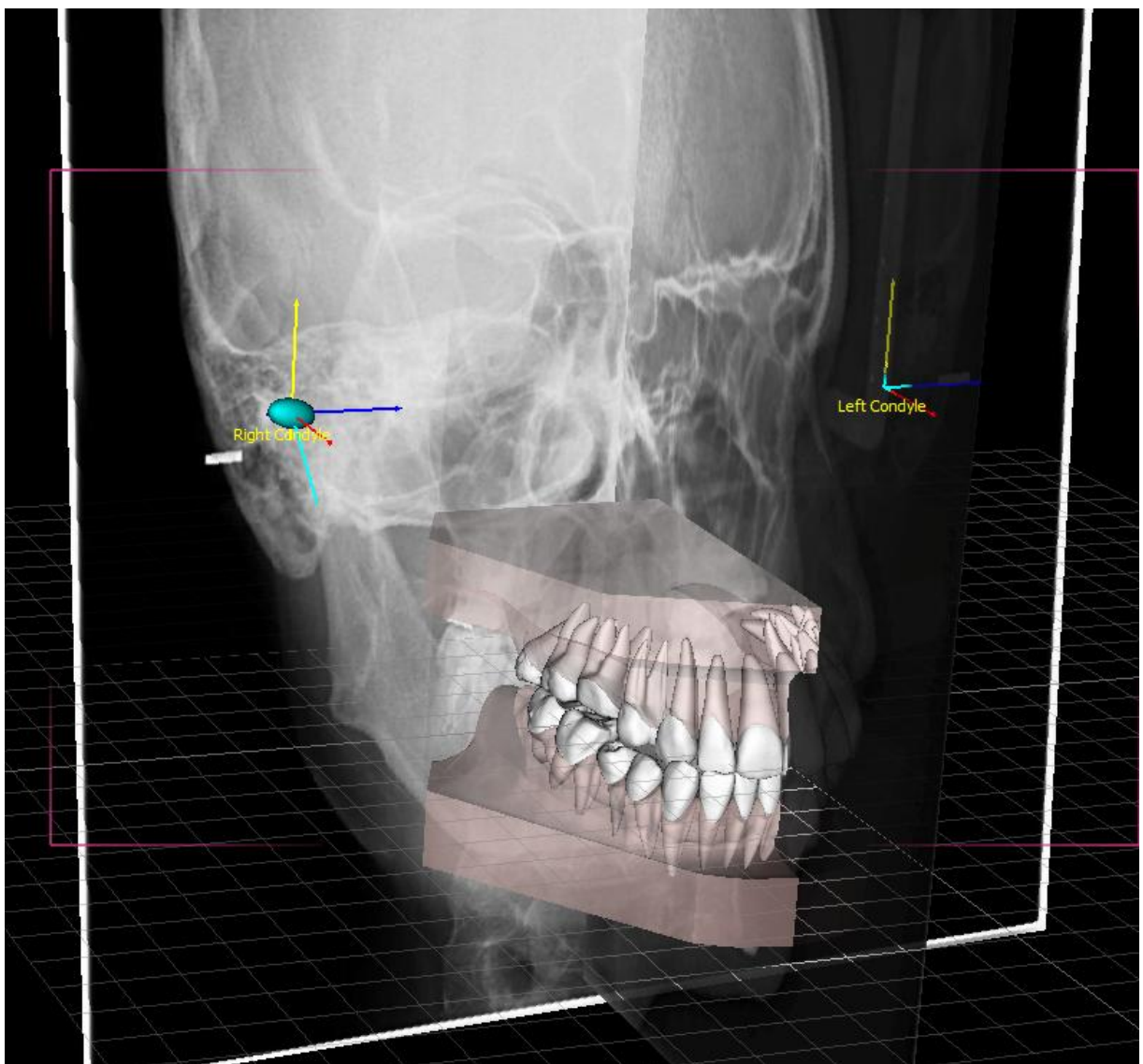
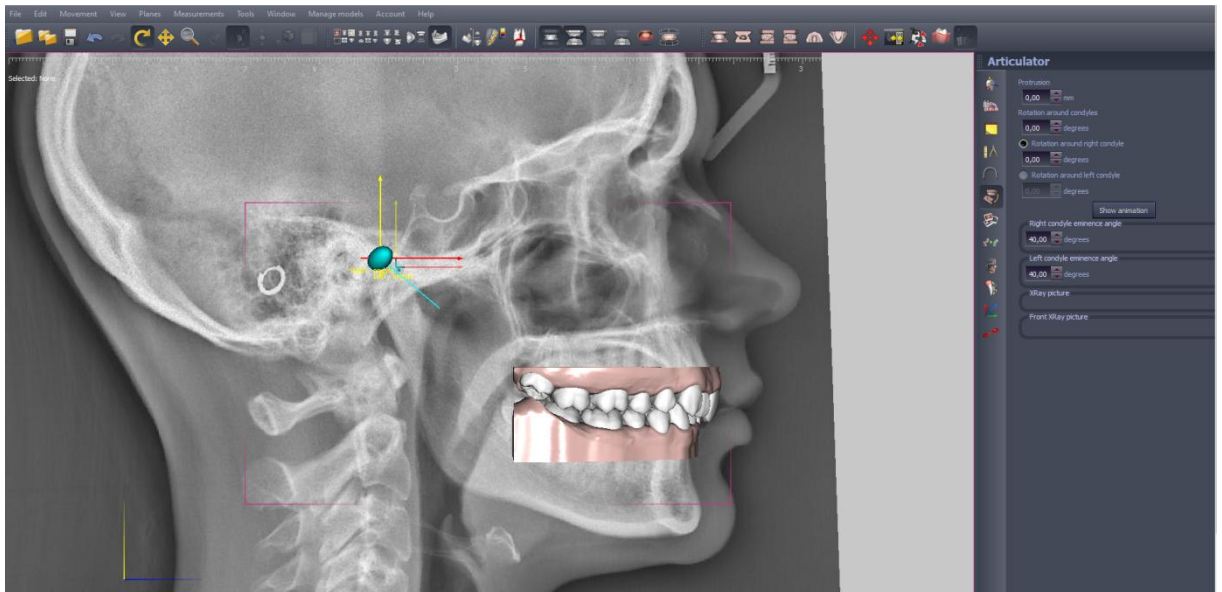
1.5. Adjusting Condylar Position in the PA View.

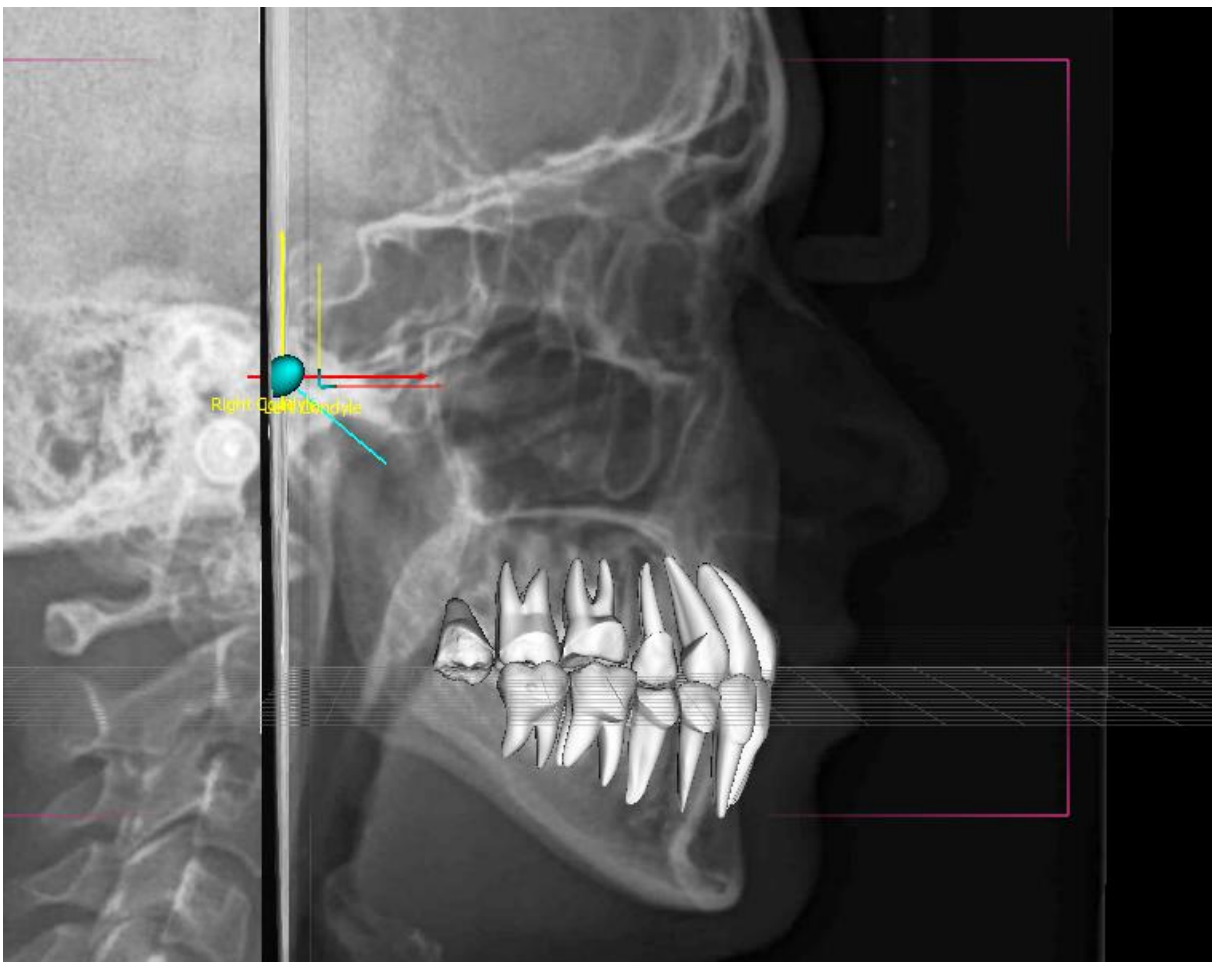
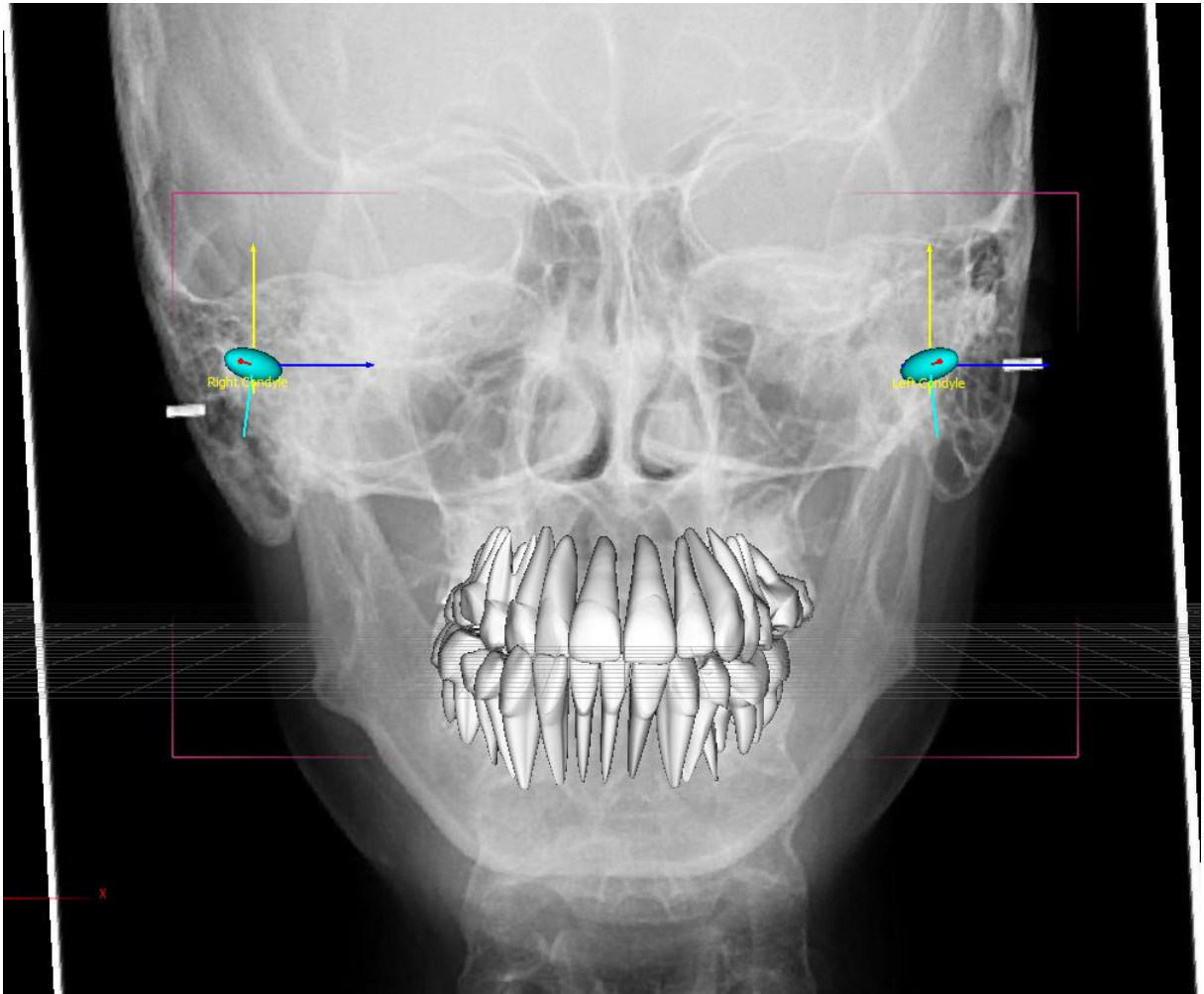
The condyles are fine-tuned in the PA view for accurate spatial representation.



1.6. Finalized Model with Condylar Positions.

After completing the steps above, the finalized model includes condylar positions aligned with the X-ray data.





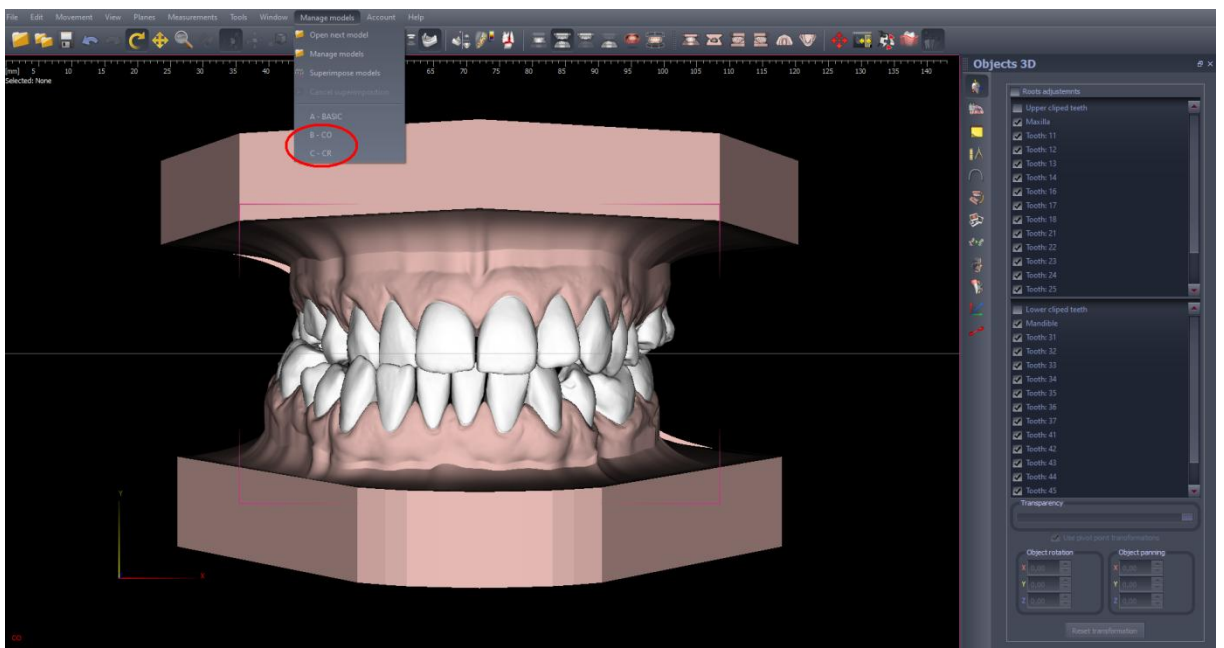
2. Central Relation (CR) and Central Occlusion (CO).

Condyles can be positioned in either central relation (CR) or central occlusion (CO) within the software. Typically, CO is the default reference, as demonstrated in the outlined procedure, where X-ray images and bite registrations were taken in CO.

2.1. Achieving Central Relation (CR).

Obtaining CR requires deprogramming, followed by new cephalometric and PA X-rays and bite registrations. This data is used to create a secondary model.

Both CR and CO models can be stored in a single DDP-Ortho file, allowing users to switch between them as needed.



2.2. Future Improvements.

Future updates to DDP-Ortho are expected to enable seamless switching between condylar positions and mandibular postures (including bite) on a single model, further enhancing workflow efficiency and accuracy.

3. Conclusion.

DDP-Ortho provides versatile tools for defining condylar positions without a facebow. Integration of X-ray data offers a precise and efficient approach for determining condylar locations in CR and CO. Planned software enhancements aim to improve usability by consolidating positional data into a unified model interface.

