DentiqGuide1.0

Implant surgical planning solution

3D Industrial Imaging

(Sillim-dong, Institute of Computer Technology), 138-412, 1 Gwanak-ro,

Gwanak-gu, Seoul, Korea

Tel. +82-70-8766-9192

Fax. +82-2-877-7555

Service. +82-07-8766-2390

Website. www.3dii.net

Contents

1 Introduction

DentiqGuide is a pre-operative planning software used to plan the placement of one or more implants based on CT and 3D scan data. The implant library that includes authenticated implants are supported. User can export the aligned implant and scan data as STL file. The use of this software requires having the necessary expertise in implant dentistry.

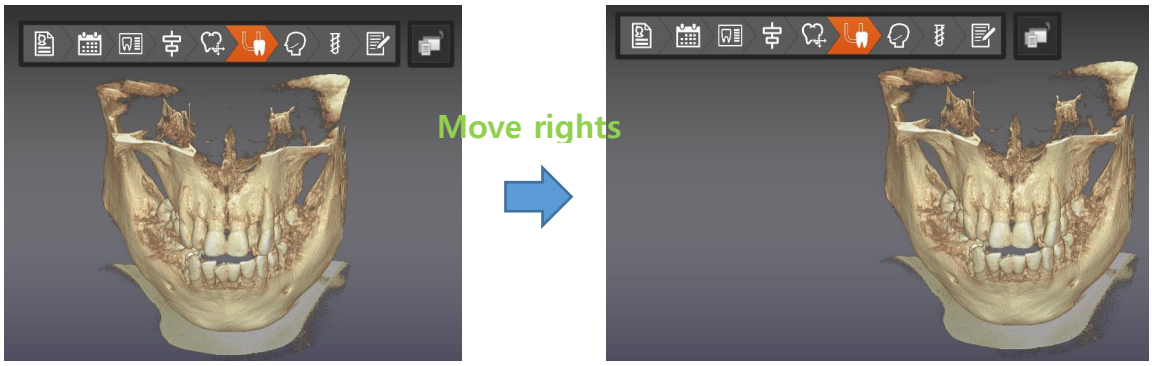
2 System requirements

	Minimum System Requirements	Recommended
OS	Windows Vista, 7, 8, 10 (64bit)	Windows Vista, 7, 8, 10 (64bit)
RAM	2GB	6GB or more at least three times as big as the data size
Graphics Card	Graphics card compatible with DirectX 10.1	High end graphic card compatible with DirectX 11 or higher GPU-dedicated memory 1GB or more
CPU	Intel i3 Dual Core	Intel i5 Quad Core or higher
HDD	2GB free space	2GB free space or more three times as big as the data size

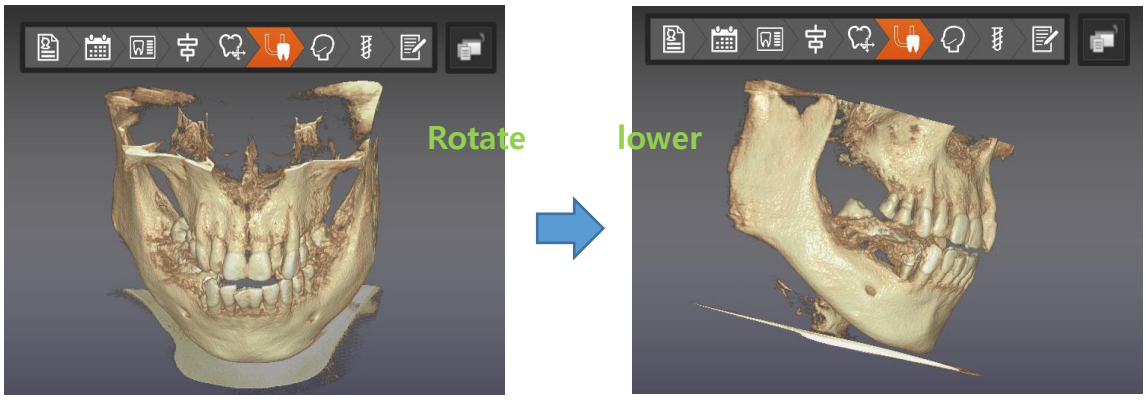
3 Basic operations

3.1 Mouse operations on 3D panel

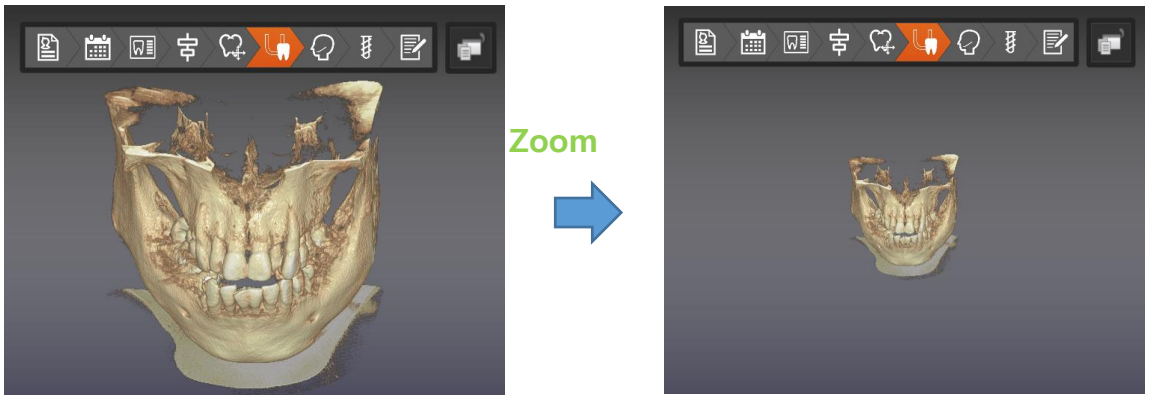
(1) Panning : Drag mouse wheel button



(2) Rotation : Right click and drag

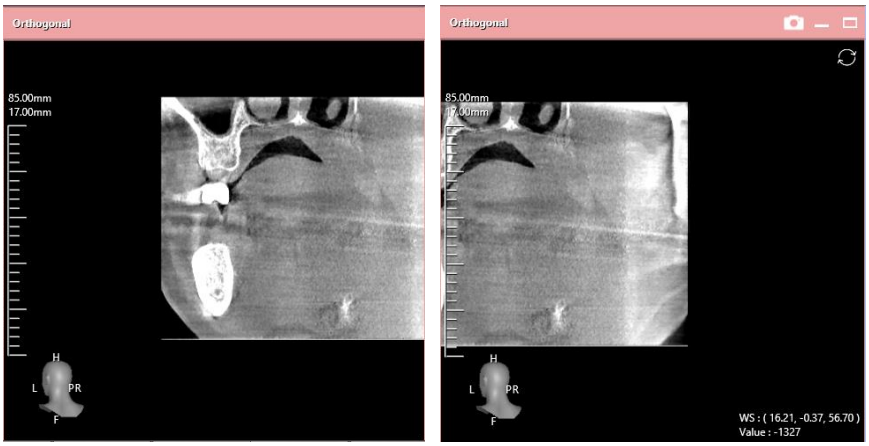


(3) Zoom in/out : Scroll mouse wheel

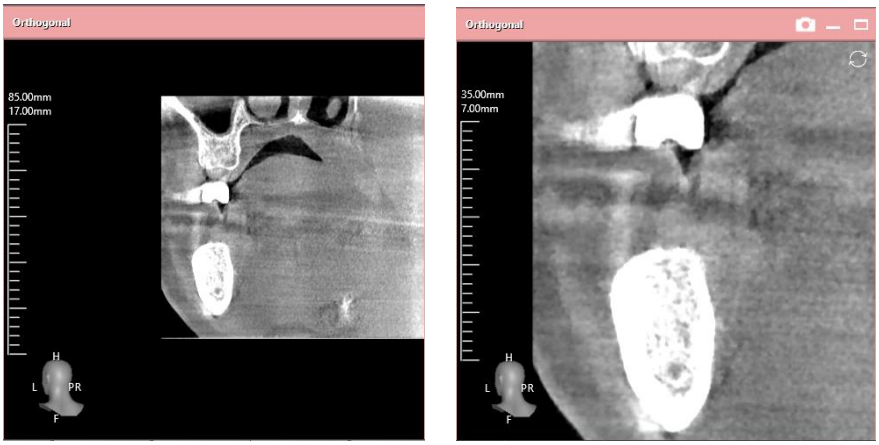


3.2 Mouse operations on 2D panel

(1) Panning : Drag mouse wheel button



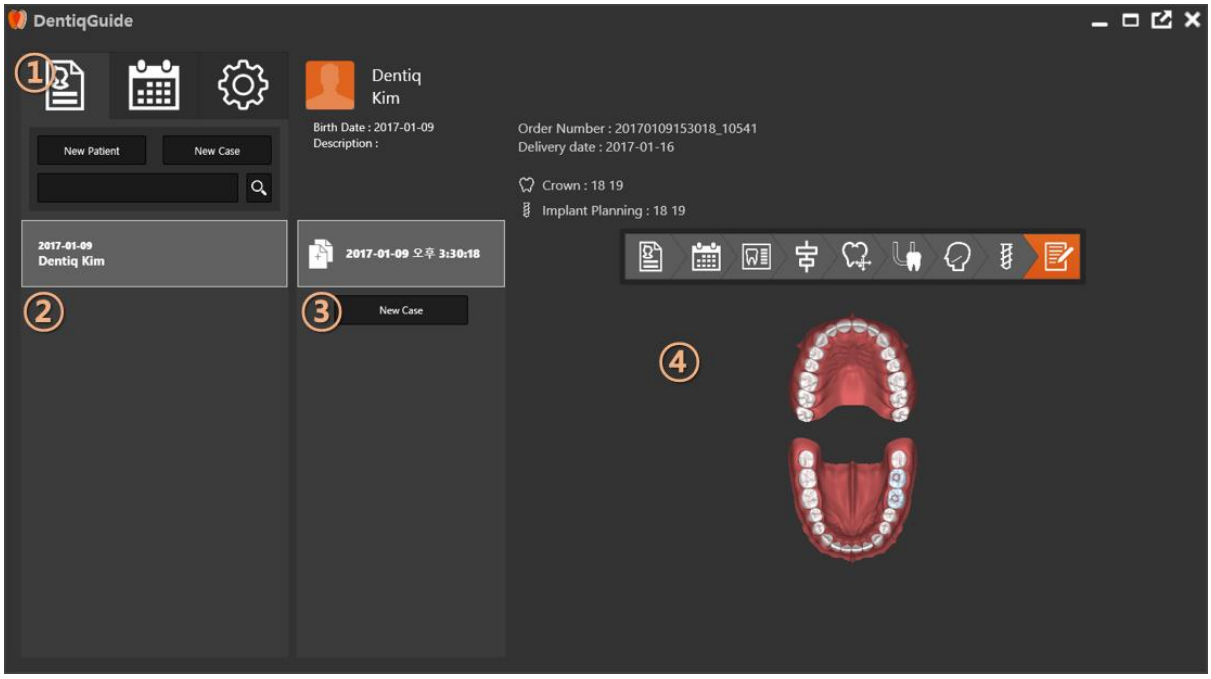
(2) Zoom in/out : Right click and drag up/down



(3) Orthogonal/Sectional plane movement : Mouse wheel

(4) Plane rotation to implant center axis implant (It is possible only when camera is aligned to implant center axis.) : Ctrl + Mouse wheel

4 Create Patient



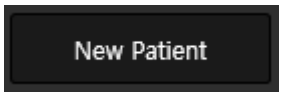
① Menu tab

② Patient list

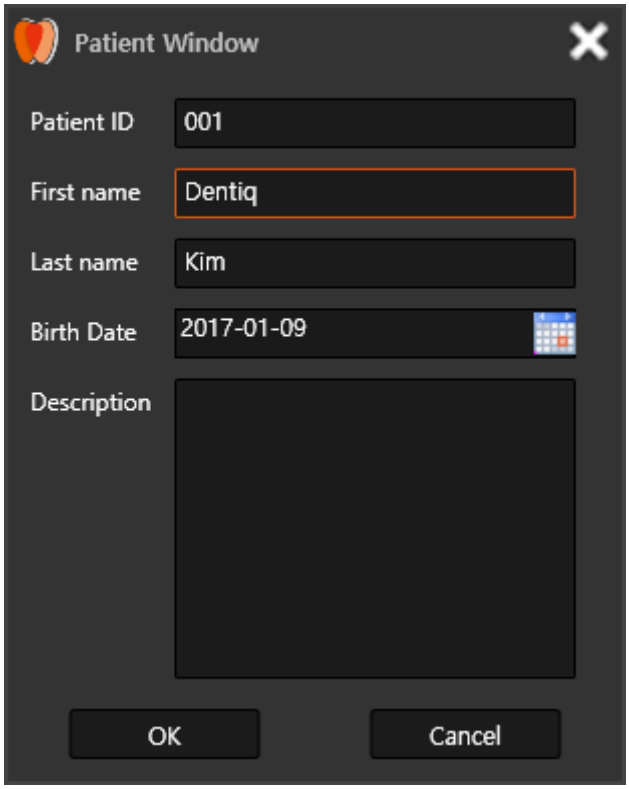
③ Case list

④ Project information panel

4.1 Create new patient



Click New Patient button.



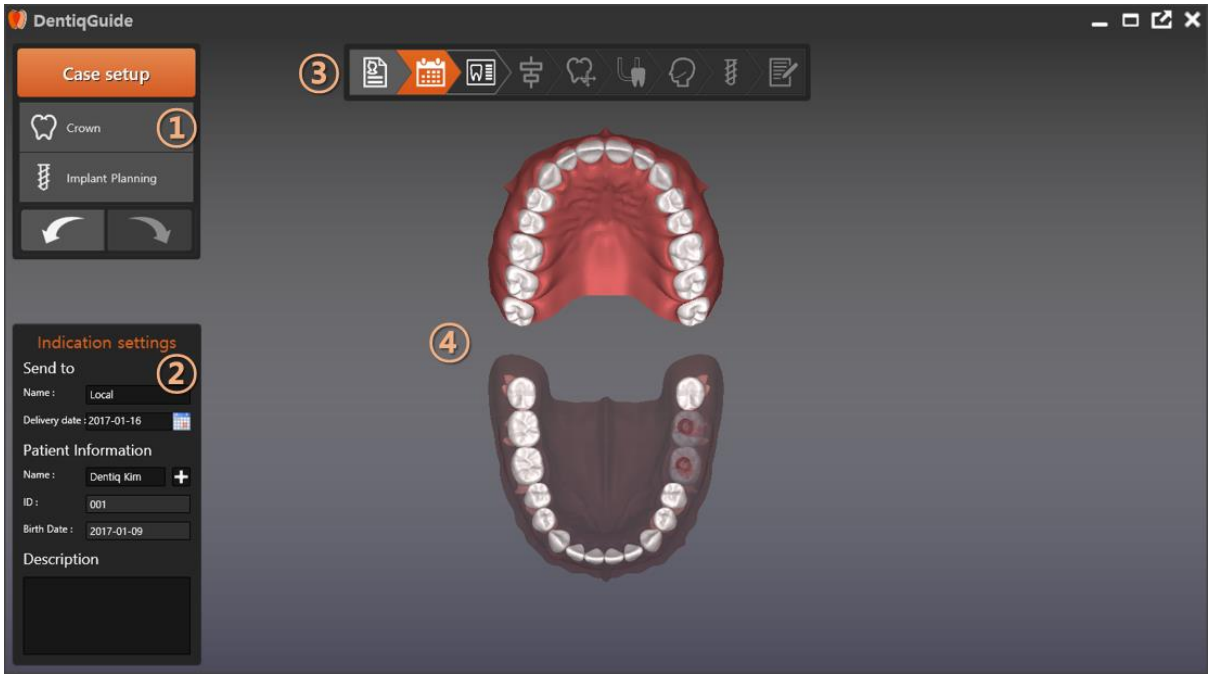
Enter patient information on Patient Window and click OK button.

4.2 Create operation plan

Choose a patient on Patient list to create operation plan.

Click New Case button.

5 Case setup



① Operation plan option (Crown/Implant Planning)

② Indication settings

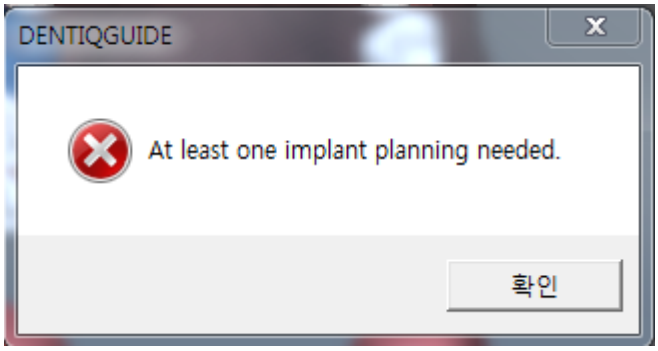
③ Progress stage

④ Main panel

5.1 Operation plan setting

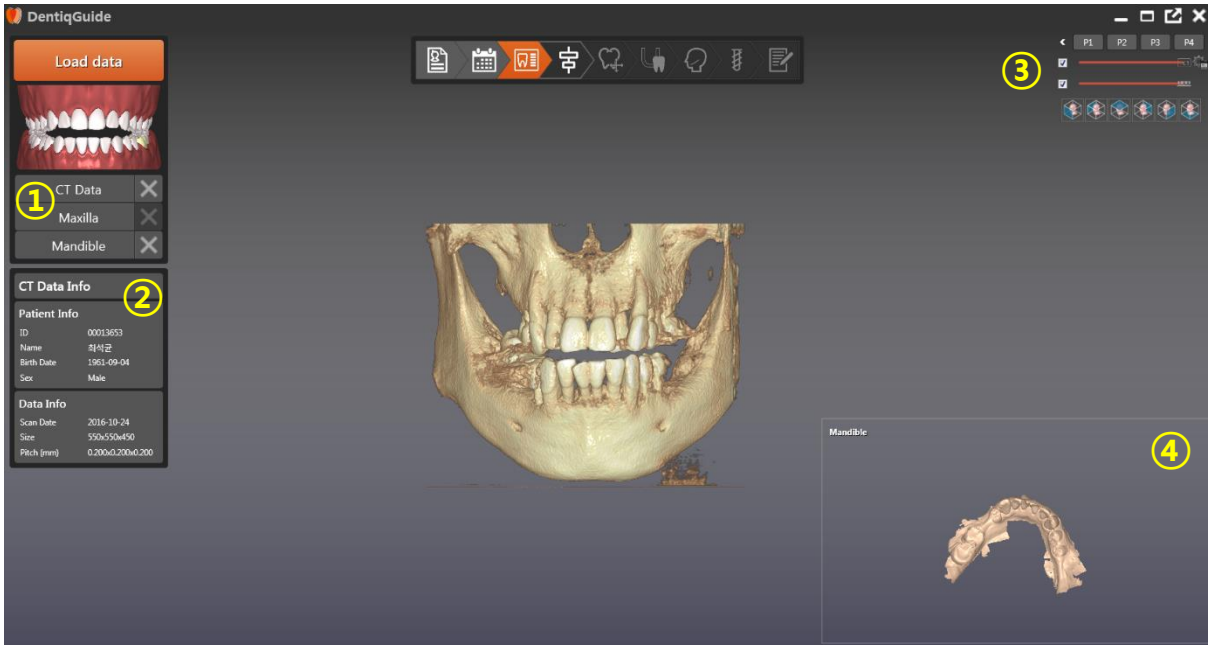
Step 1: Choose teeth to be operated on Main panel.

Step 2: Set crown and implant planning on Operation plan option. Progress stage are changed according to the option that user set. If user choose crown option only, the following window will be pop up and user can't move on to the next step.



Step 3: If there is no patient to be chosen, Click button to add new patient or search patient name to choose existing registered patient.

6 Load data



① Load data

② CT Data Info

③ Visualization option panel

④ Data visualization panel

6.1 Load data

Click 

button to open DICOM file.

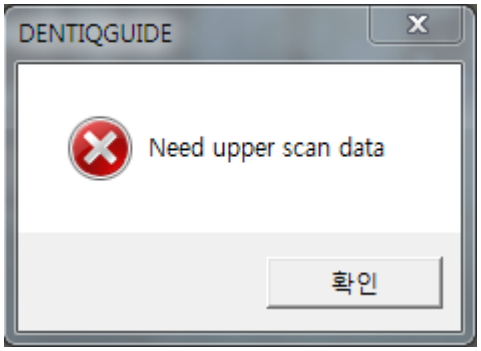
If one folder includes 2 or more series, the following File Analysis Window is popped up. Click the data that user want to choose and click Open button.

CT Data Information (Patient Info / Data Info) is appeared on the left side of the main window. Click Maxilla button to load upper scan data.

Click Mandible button to load lower scan data. The loaded scan data is appeared on the Data visualization panel, lower right side of the screen.

Click button to delete the loaded data.

If scan data is not loaded, the following window is popped up and user can't move to on the next step.



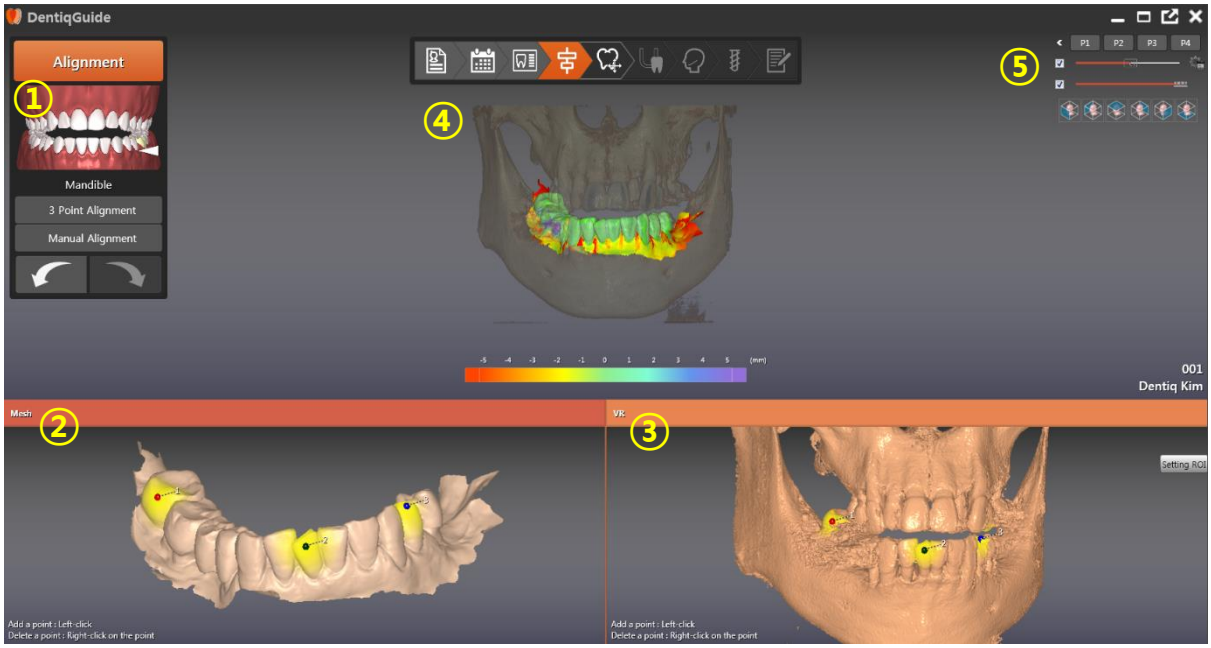
User must load the corresponding scan data between Maxilla/Mandible. If user choose crown on Operation plan option step, lower scan data must be loaded.

6.2 Data visualization panel

Put mouse on Data visualization panel to appear buttons on the upper right side of the panel. Click  button to interchange main visualization panel and data visualization panel. Click  button to enlarge data visualization panel. Click  button to return to its original size.

※ Please refer to Visualization option panel in this manual for more details about visualization option panel.

7 Alignment



① Operation plan panel

② Mesh panel

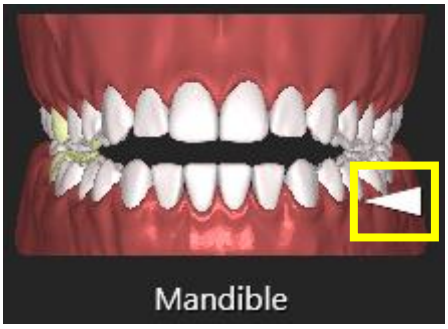
③ Volume Rendering(VR) panel

④ Main panel

⑤ Visualization option panel

7.1 3 Point Alignment

Click on the location of scan data to be aligned between upper and lower on the Operation plan panel. User can choose the scan data by moving arrow button on the Operation plan panel as shown below.



Place three points to align mesh data and volume data. If user places points on the data, the yellow region area that is near the point is appeared. Based on the yellow areas, two data can be aligned. The same colored points of two data must be aligned on the same location of each data. The points can be moved by dragging with mouse left button. Right click to delete the points.

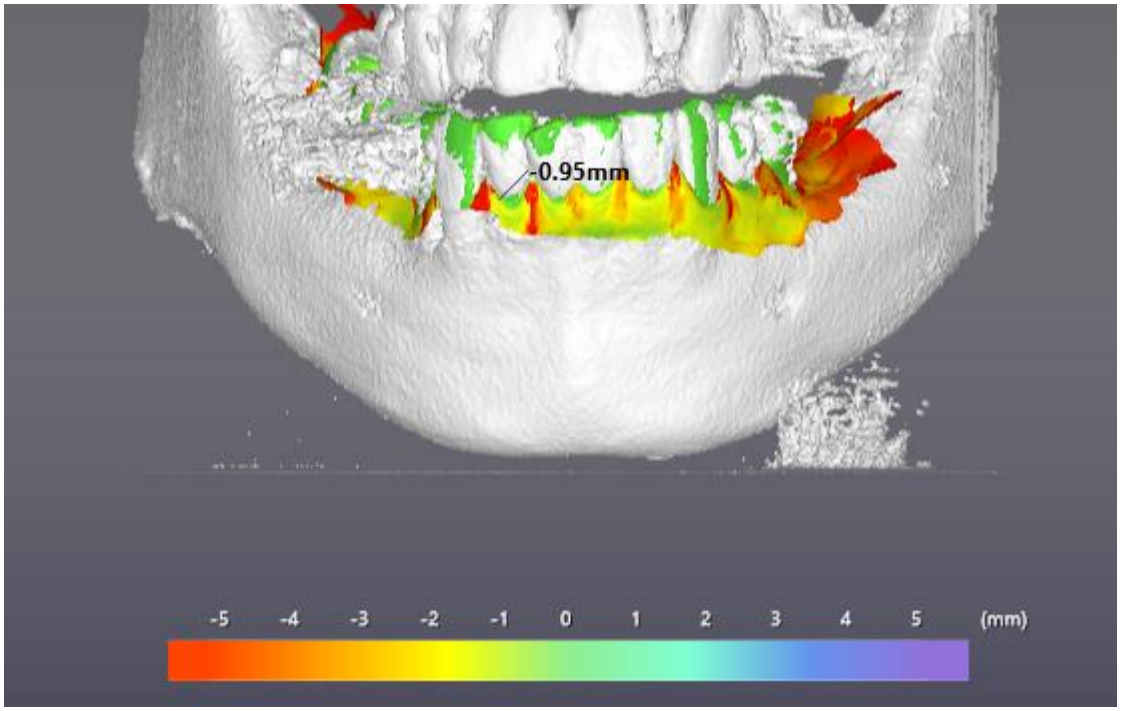
The alignment result is appeared on Main panel. The difference values of mesh data and volume data are visualized as color mapping on mesh data. Place a mouse pointer on the mesh data to check difference value of the corresponding location.

Click  Undo/Redo button to undo or redo the working history. Undo/Redo feature of upper and lower scan is operated separately because the working history of the upper scan and lower scan are segregated from each other.

※ For more information about capture feature, please refer to 'Capture' of this manual.

※ For more information about Visualization option panel, please refer to 'Visualization option panel' of this manual.

Click  button to delete all matching points. Click  button to synchronize mouse events related to camera of Mesh panel and VR panel.

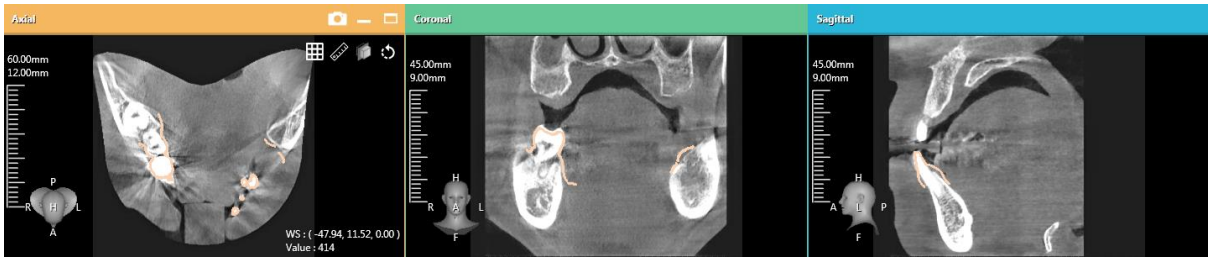


7.2 Manual Alignment

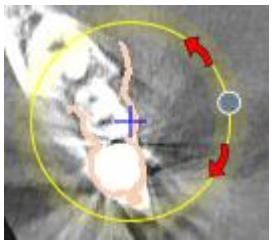
Manual alignment is activated after 3 Point alignment.

Click 

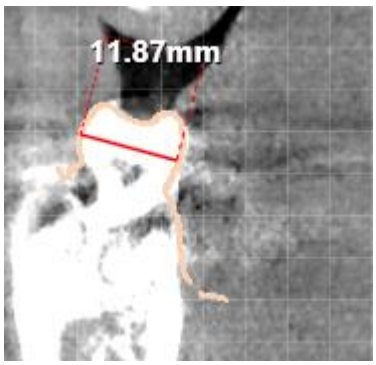
button to appear 2D MPR panel (Axial/Coronal/Sagittal) at the bottom of the screen as below.

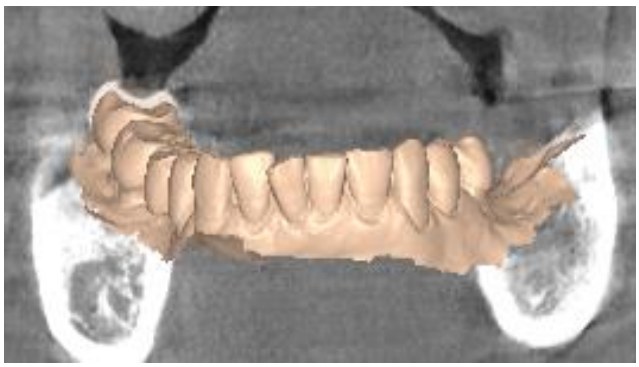


Click  button on 2D MPR to activate controller as below. User can adjust the aligning location of mesh data by rotating the point on the yellow circle.

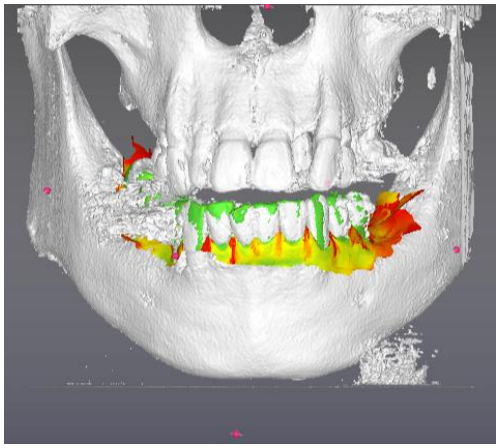


Click button to show grid on MPR image. Click button to measure the length. Click button to visualize mesh data as 3D image on MPR.



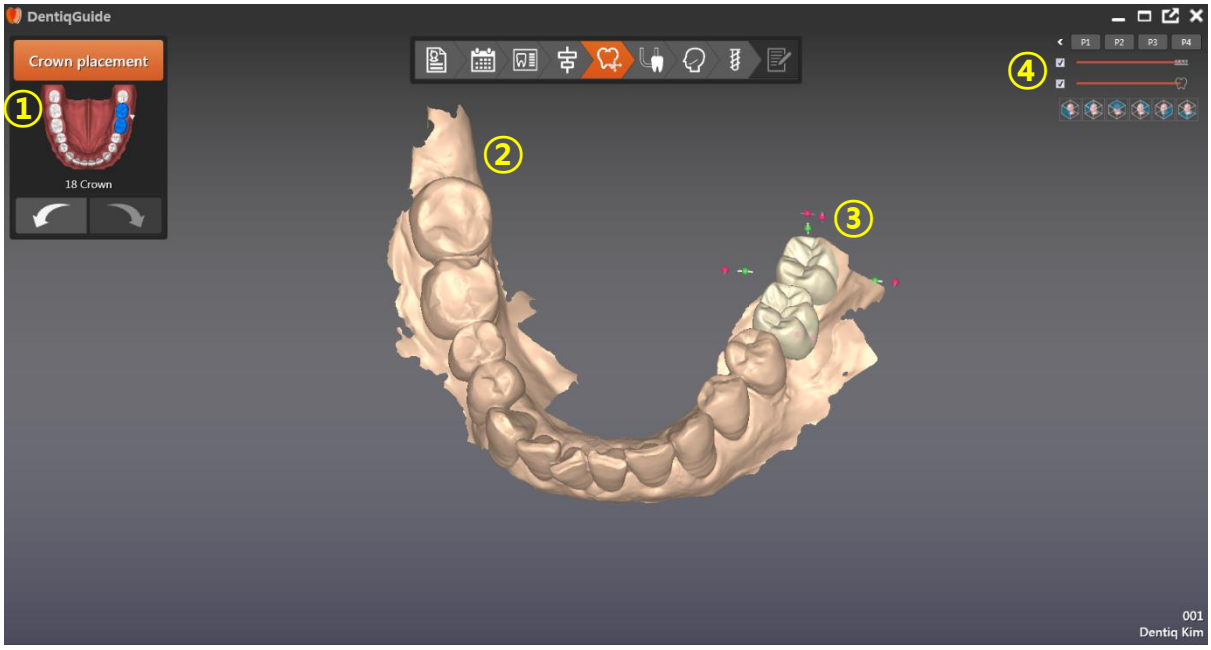


Click scan data on Main panel to activate pink controller as below. User can rotate scan data by adjusting the pink controller. Left click and drag to move scan data as distance that user moves the mouse.



※ For more information about Visualization option panel, please refer to 'Visualization option panel' of this manual.

8 Crown placement



① Operation plan panel

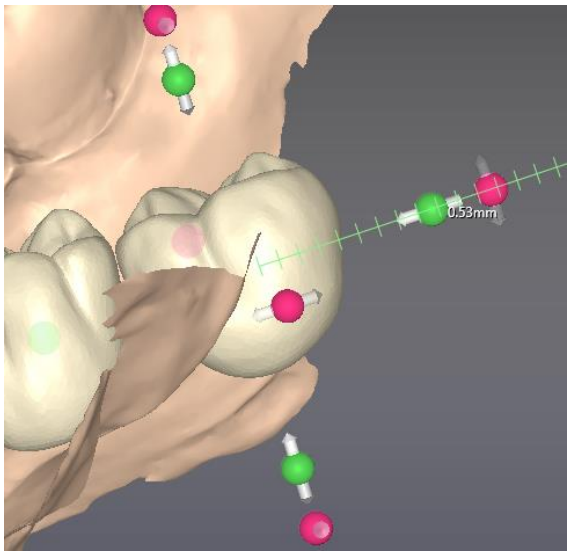
② Main panel

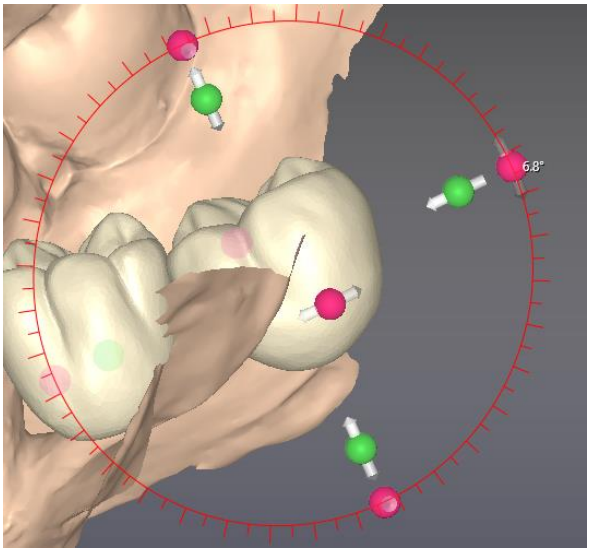
③ Object controller

④ Visualization option panel

8.1 Crown movement, rotation and size adjustment

Click the target teeth to be moved on Operation plan panel or click the target crown to be moved on Main panel. User can choose several tooth and crowns by clicking while pressing Ctrl key. The object controller as below is appeared around the crown. Left click and drag the chosen crown to be moved as the distance that user moves the mouse on Main panel.

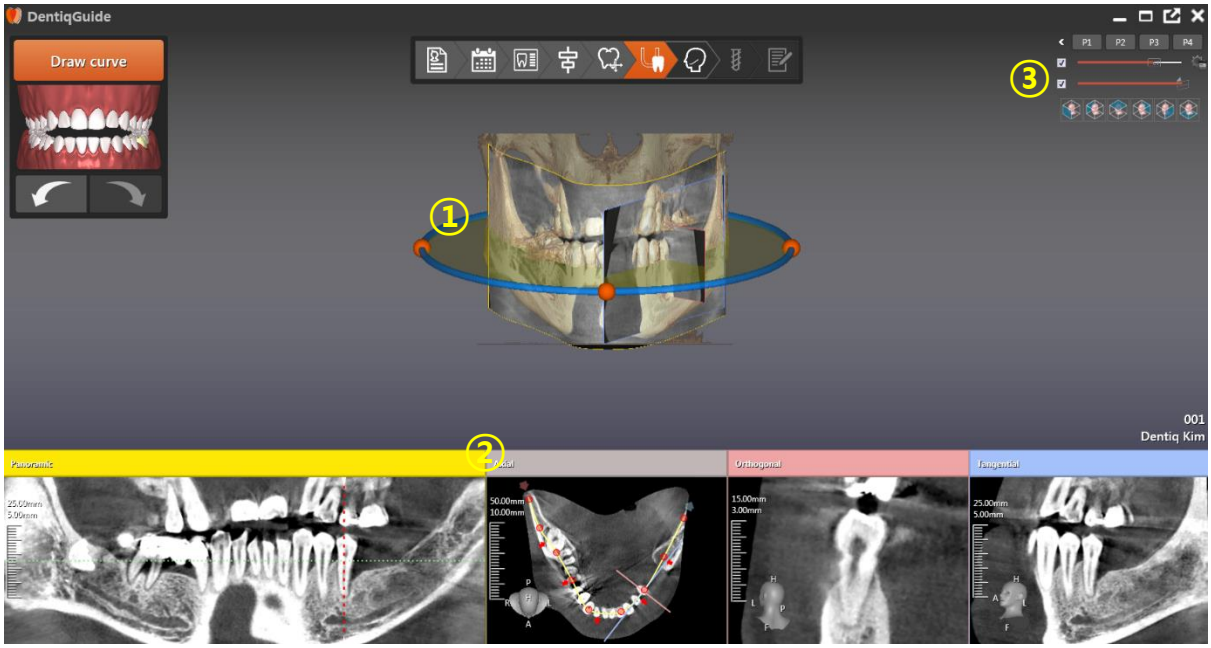




Left drag a green sphere to adjust the crown size as the white-lettered length. Left drag a pink sphere to rotate the crown as the white-lettered angle.

※ For more information about Visualization option panel, please refer to 'Visualization option panel' of this manual.

9 Draw curve



① 3D plane adjustment widget

② MPR panel (Panoramic, Axial, Orthogonal, Tangential)

③ Visualization option panel

9.1 Draw panoramic curve

Step 1: Click the yellow cross section of 3D plane adjustment widget to be parallel-moved to the right place. Put the mouse pointer on the blue circle line to visualize the sphere that shows direction to rotate. Left drag the green or orange sphere to rotate the plane as the distance that user moves the mouse. The yellow cross section that is parallel-moved or rotated is visualized on Axial panel.

Step 2: Left click at the right place on Axial to insert control point and draw curve. Left drag the inserted control point to move and right drag to delete. Double click to exit the drawing curve. Click  button on Axial panel to delete all control points.

※ For more information about capture feature, please refer to 'Capture' of this manual.

9.2 Planar movement

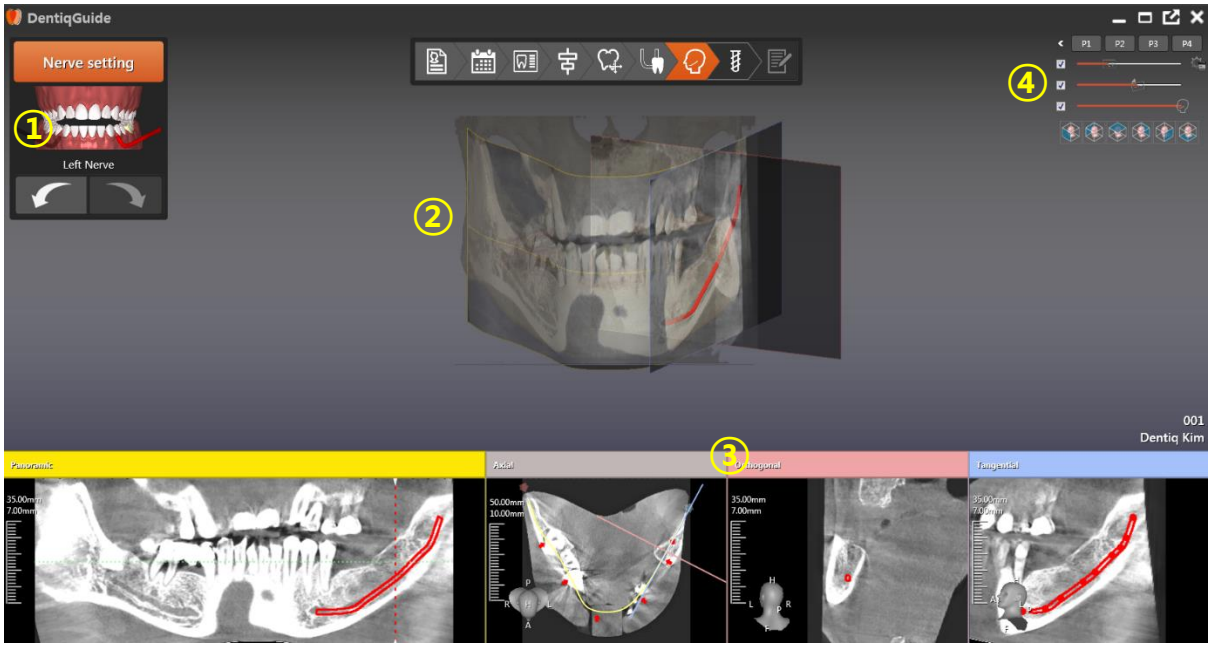
Left drag the red dotted line or left click the specific spot on Panoramic panel to move the plane of Orthogonal/Tangential panel to the corresponding location. Scroll mouse wheel to move on Orthogonal/Tangential plane. Drag mouse wheel button to move the image on Orthogonal/Tangential panel and click  button to return the central point of camera to curve.

9.3 Panoramic plane visualization option

Drag the slider bar to adjust the plane height and thickness. Click the combo box at the bottom to choose visualization option.

※ For more information about Visualization option panel, please refer to 'Visualization option panel' of this manual.

10 Nerve setting



① Operation plan panel

② Main panel

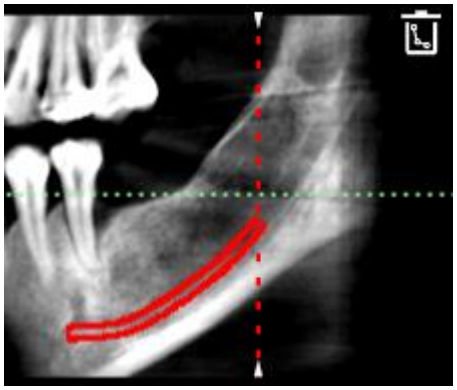
③ MPR panel (Panoramic, Axial, Orthogonal, Tangential)

④ Visualization option panel

10.1 Nerve setting

Left click the nerve according to the direction of teeth to be operated. The chosen nerve is appeared with red color.

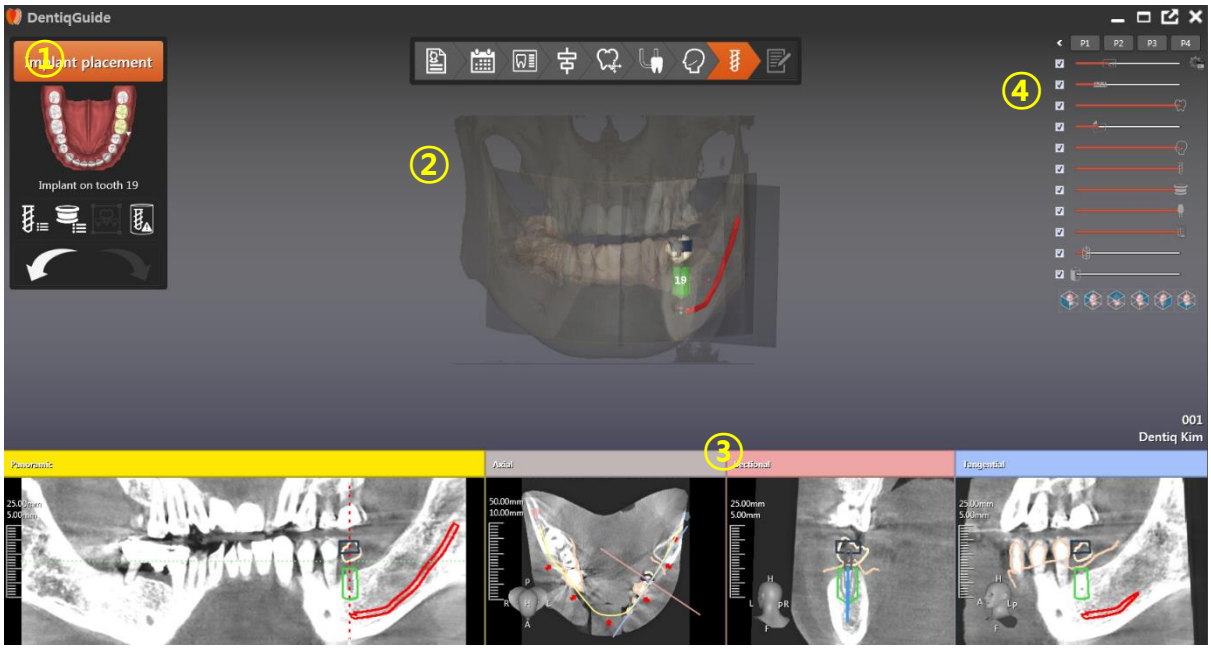
Put the mouse pointer on Panoramic panel and left click to draw nerve through the neural canal. The drawn nerve is displayed as below.



Left drag on Orthogonal/Tangential panel to change the points of nerve and right click to delete. Click button of the upper right side of MPR panel to delete all points. The transparency of the visualized nerve and 3D panel plane can be adjusted on the Visualization option panel of the upper right side of screen.

※ For more information about Visualization option panel, please refer to 'Visualization option panel' of this manual.

11 Implant placement



① Operation plan panel

② Main panel

③ MPR panel (Panoramic, Axial, Orthogonal, Tangential)

④ Visualization option panel

11.1 Place implant

Step 1: Choose the teeth to be placed on Operation plan panel

Step 2: Choose the implant in implant library

Step 3: Adjust the implant size, angle and location using object controller

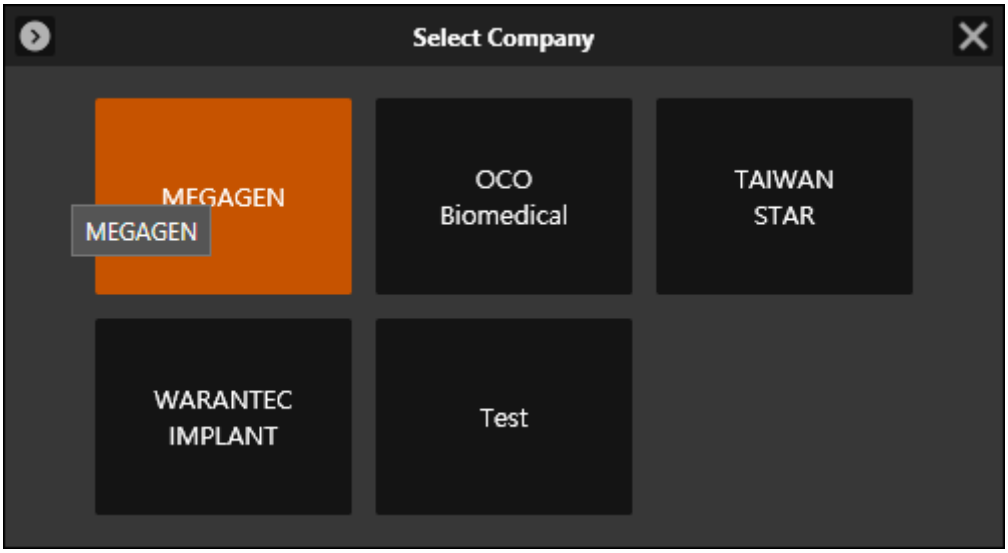
Step 4: Verify using implant measuring instruments and collision test

11.2 Implant library

Click button on the bottom of Operation plan panel to appear implant library. (If user changes the implant, press shortcut key 'I' to open implant library.)

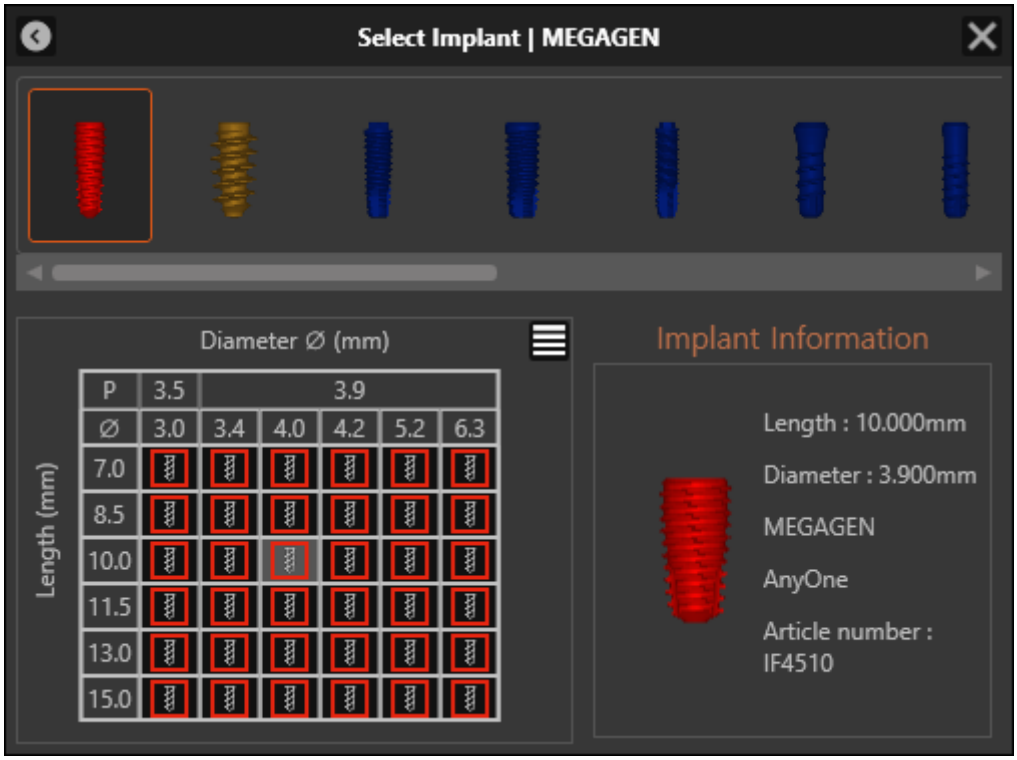
Step 1: Choose the manufacturer on the list.

If there is the chosen manufacturer already, button is activated. Left click to move to the next step for implant model choice.



Step 2: Choose the implant according to the patient state.

The model series of the chosen manufacturer is appeared and choose the corresponding model series to show many implant models that the length and diameter are different as table type. Click the suitable implant model to visualize as 3D model and appear the information on the right side. The information shows length, diameter, manufacturer name, model series name, model name and click button to appear list view type. Left click to choose the implant model. Click button to return to the screen for manufacturer choice. After choosing an implant, click button to exit the implant library.



11.3 Sleeve library

Click button or press shortcut key 'S' on the bottom of Operation plan panel to appear sleeve library. This feature is used when changing the existing sleeve. The operating method is same as that of implant library.

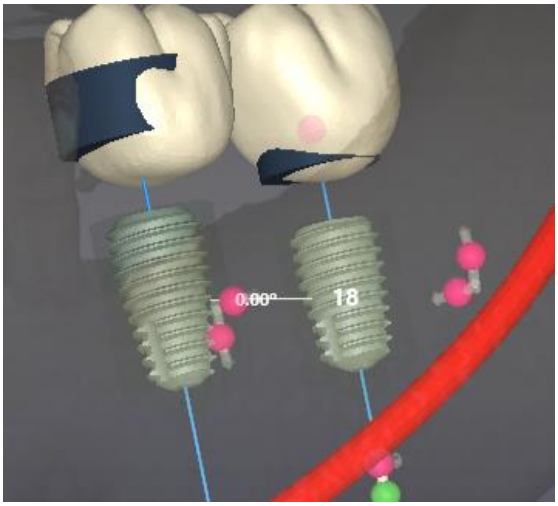
Step 1: Choose the manufacturer on the list.

Step 2: Choose the suitable sleeve. (Please refer to the bottom part of the table that shows offset initial value from implant to sleeve, min and max value.)

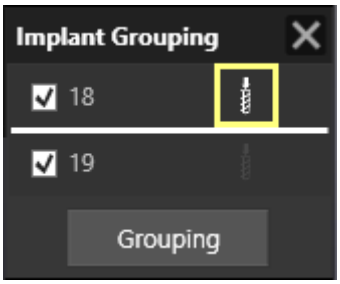
11.4 Implant grouping

Click  button on the bottom of Operation plan panel or press shortcut key 'G' to pop up implant grouping window. User can use implant grouping only when the placed implants are more than one. The implants within the group are

parallel by rotating to the direction of the basic implant axis.

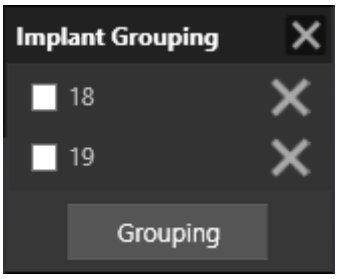


Step 1: Click the checkbox of the target implants to be grouped.



Step 2: Click the implant icon to set the basic implant.

Step 3: After setting, click Grouping button at the bottom.

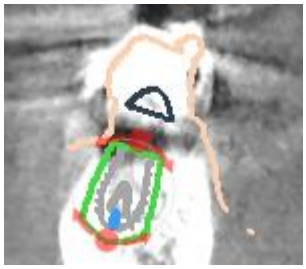


Click button to release the grouping. The implant belonging to an existing group can be grouped as other group and in this case, the existing group is canceled.

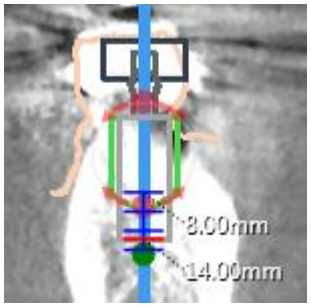
11.5 Implant size, angle and location adjustment

The object controllers are appeared around the implant on Main panel as below. User can adjust the implant size, angle and location by using object controllers.

User can adjust the implant angle by rotating the red point around the implant on Sectional/Tangential panel as below.

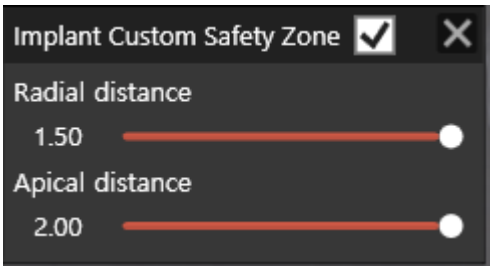


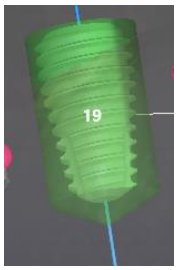
Click  button on the upper right side of Sectional/Tangential panel to activate the widget. User can adjust the implant size by using the widget



11.6 Implant custom safety zone customizing

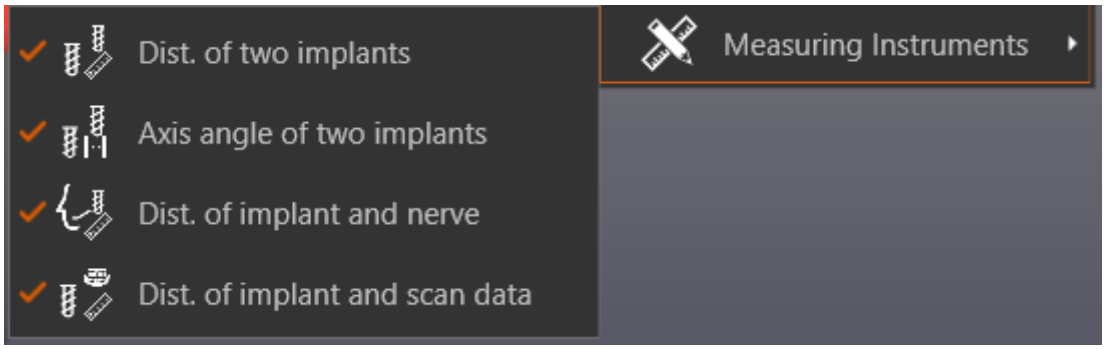
Click  button on the bottom of Operation plan panel and press shortcut key 'Z' to pop up Implant custom safety zone window.





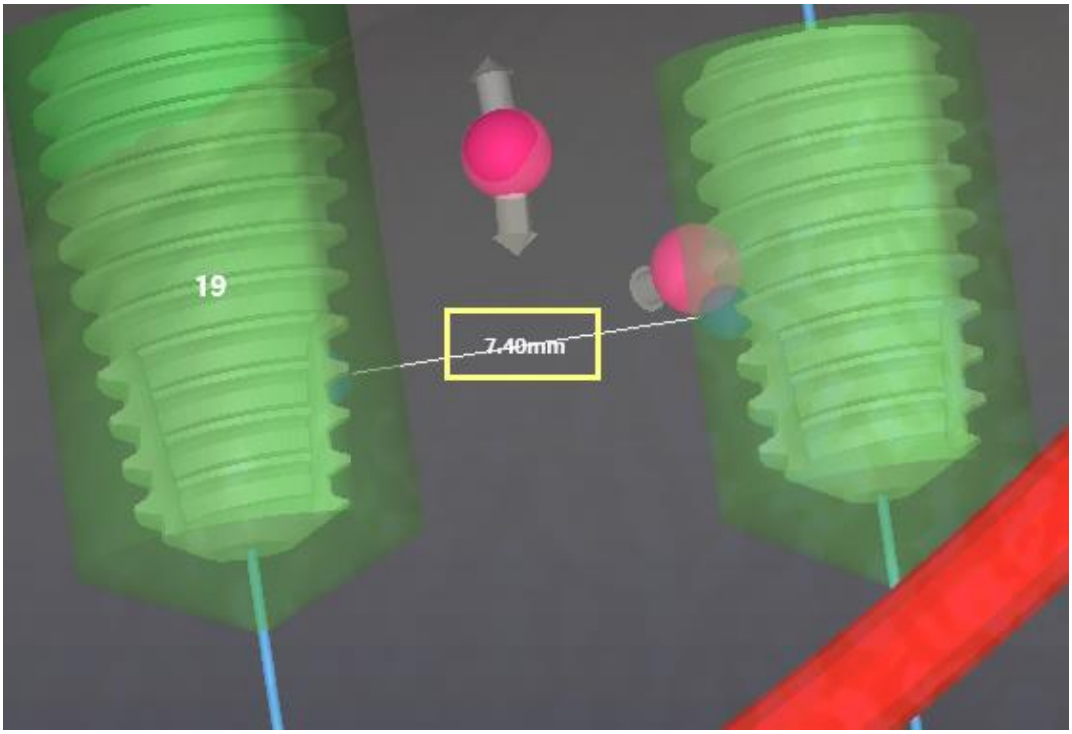
Check the upper check box to activate the custom safety zone, then user can adjust Radial/Apical distance by adjusting slider bar.

11.7 Implant measuring Instruments

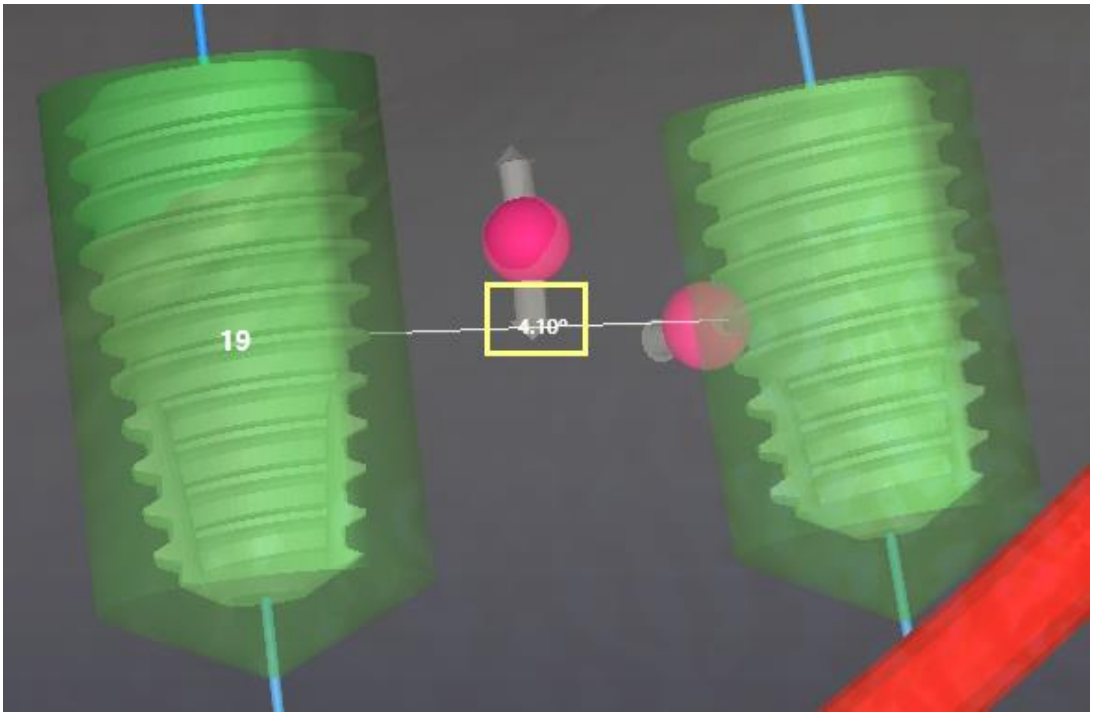


Right click to appear Implant measuring instruments pop up menu on Main panel.

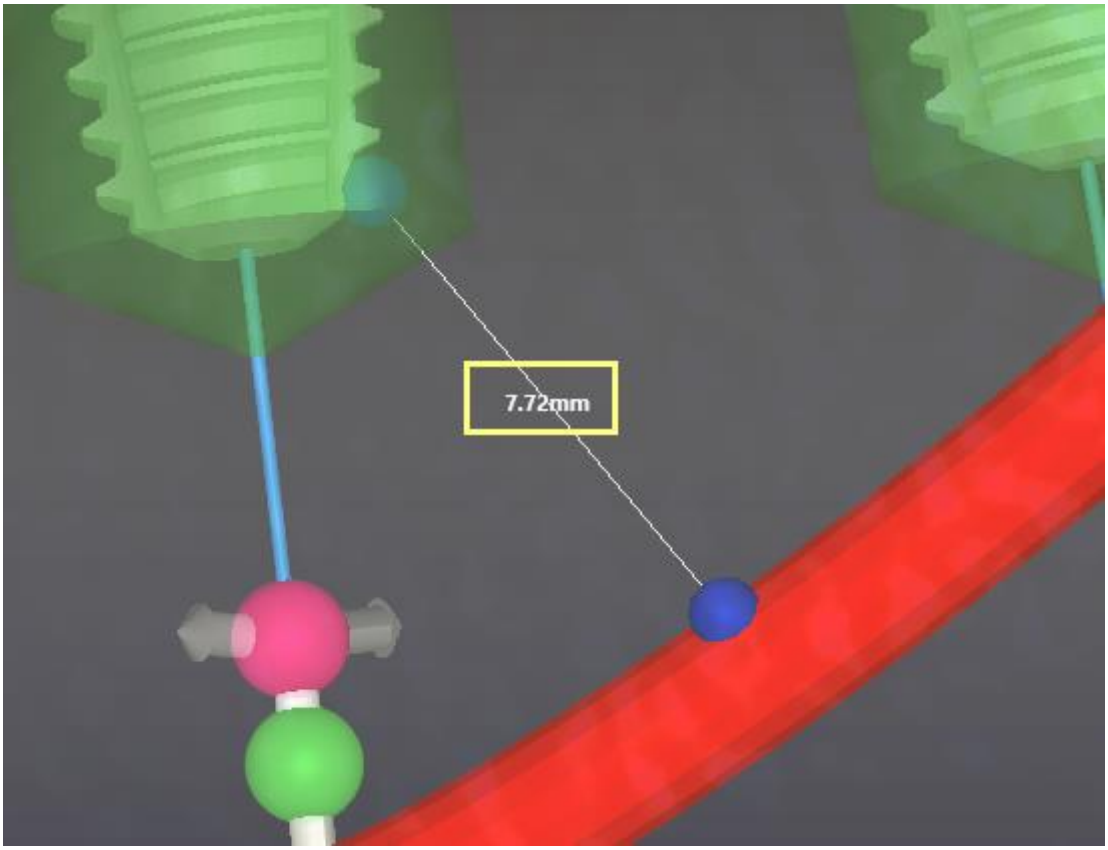
(1) Distance of two implants (Shortcut key: 2): It shows the distance from the chosen implant to the other implant.



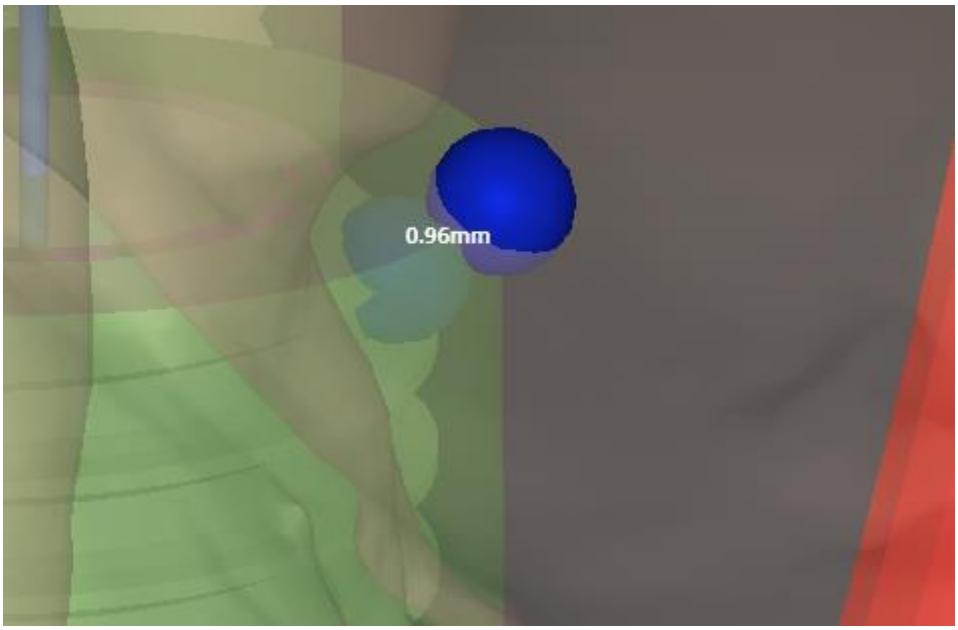
(2) Axis angle of two implants (Shortcut key: 3): It shows the angle from the chosen implant to the other implant.



(3) Distance of implant and nerve (Shortcut key: 4): If shows the distance from the chosen implant and nerve.

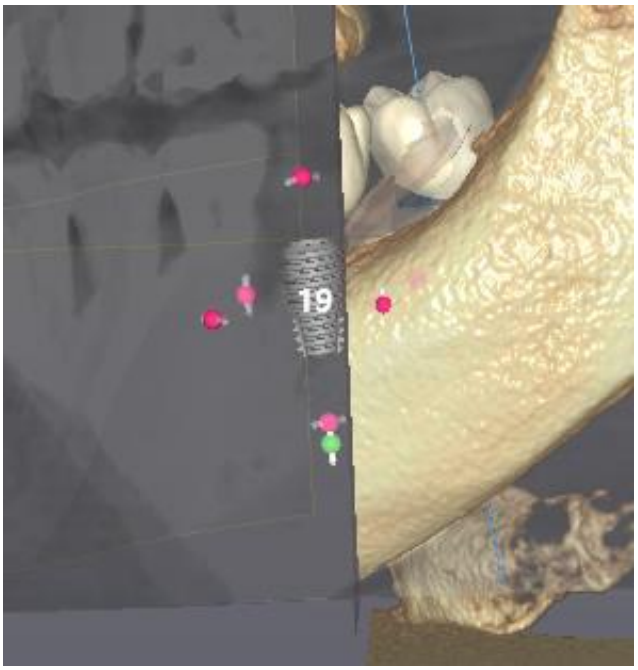


(4) Distance of implant and scan data (Shortcut key: 5): It shows the distance from the chosen implant and scan data.



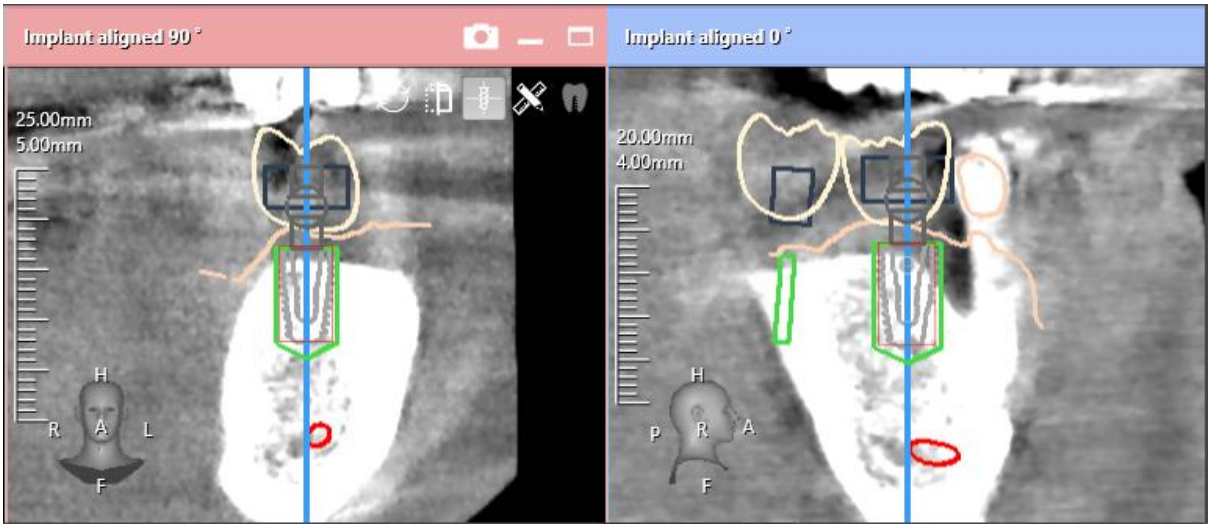
11.8 Implant tools

(1) Clipping plane (Shortcut key: Mouse cursor on 2D + L): Click  button on the upper right of Sectional/Tangential panel. The clipping plane of all objects and CT data except the implant are visualized in the current view direction of MPR panel on Main panel.



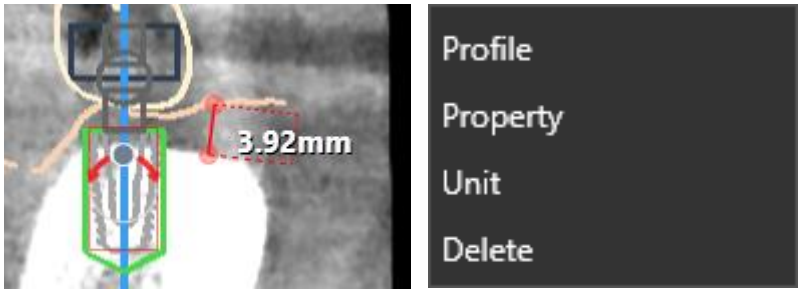
(2) Move camera to implant center axis (Shortcut key: Choose implant + F):

Click button on the upper right of Sectional/Tangential panel to align the center of the chosen implant and that of MPR panel camera.



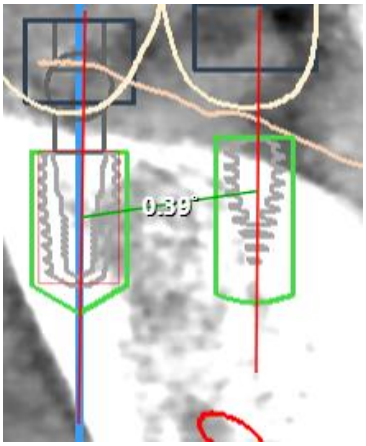
(3) Measurement: Click button on the upper right of Sectional/Tangential panel to pop up the measuring instruments. Drag the left button to move measuring instruments.

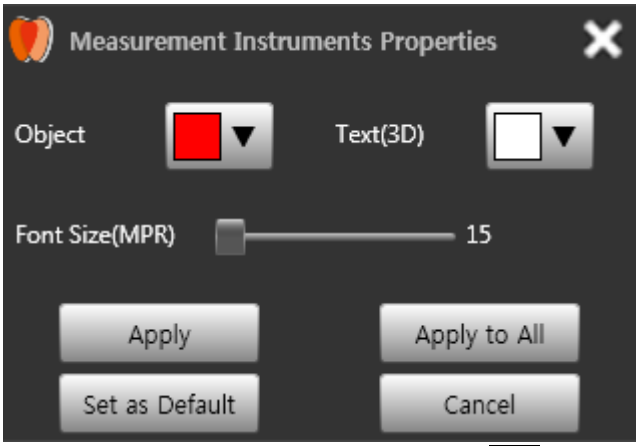
A. Line/Distance (Shortcut key: Mouse cursor on 2D + L): Click button and drag the left button to draw a line and measure the length.



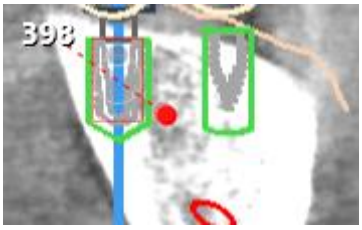
Right click after choosing the drawn line to use profile, property, unit and delete feature on the pop up menu.

B. Angle between two lines (Shortcut key: Mouse cursor on 2D + A): Draw two lines with left drag after clicking button to measure the angle between the two implant axes in H shape. Right click to use property and delete feature.





C. HU value (Shortcut key: Mouse cursor on 2D + H): Click HU button and left click where HU value is measured. Drag the left button to move the white figure.

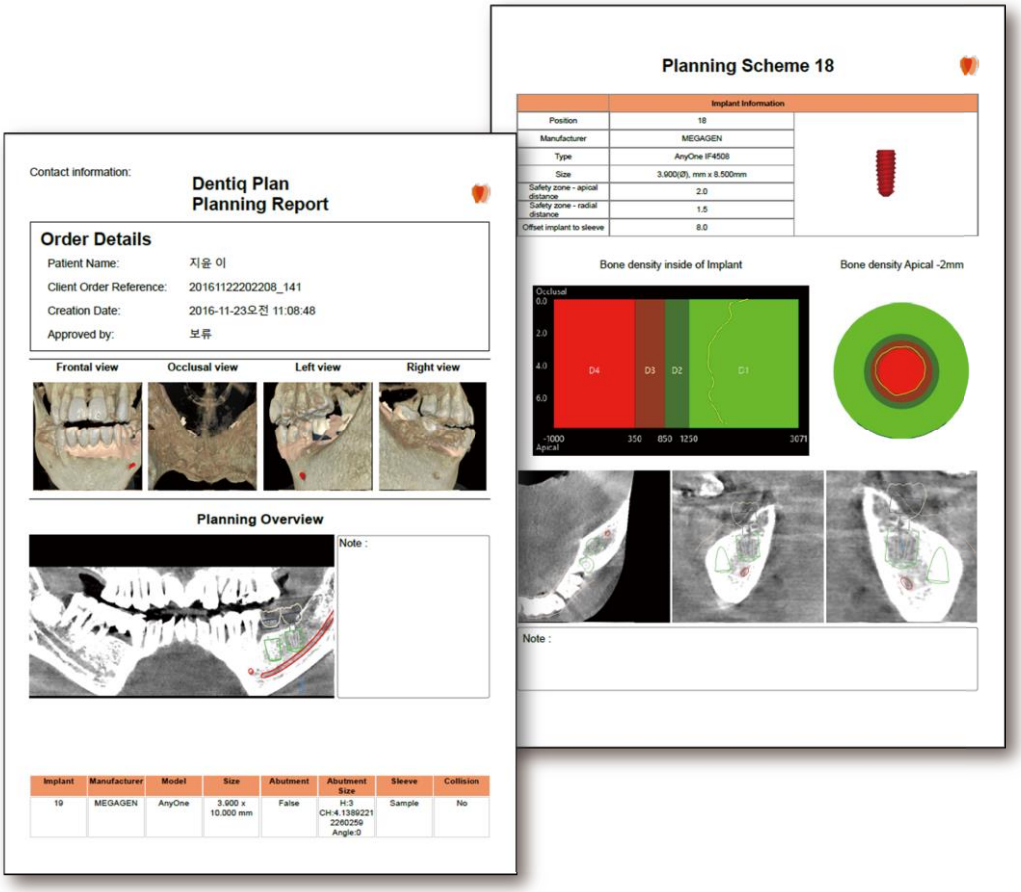


12 Result

12.1 Export project

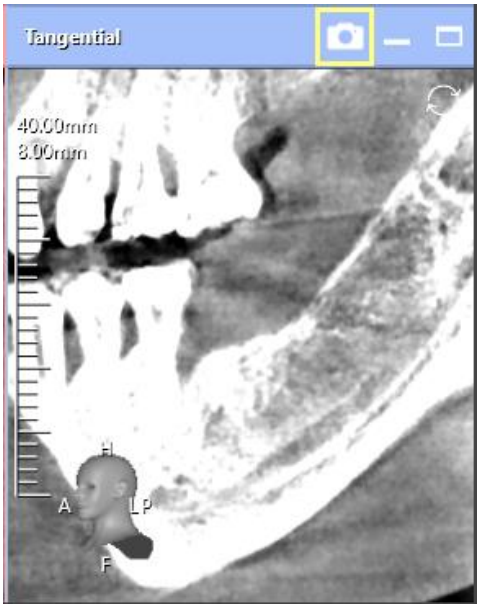
Click Export project button to save the current project. After saving, choose the folder where the current project is saved.

12.2 Show surgical report



Click Show surgical report button to export the report above as PDF file. The file is save in My documents -> DentiqGuide folder.

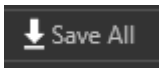
13 Capture

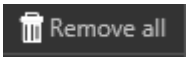


Click camera button on the upper right of MPR panel of each stage to capture current MPR screen and display the Captured Image List Window.

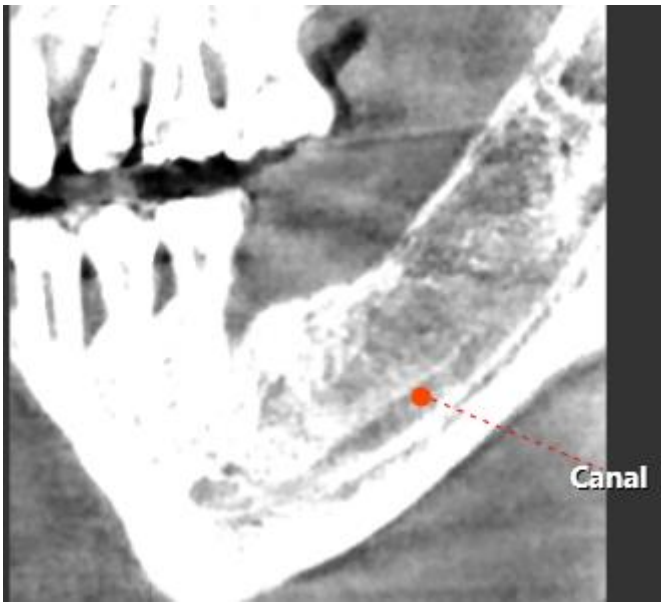
In the Capture list on the bottom of the window, user can choose the image with left click to display on the window. Put the mouse pointer on the image to appear X mark  and click X to delete the corresponding image on the list.

Click 

button to save the chosen image and click 

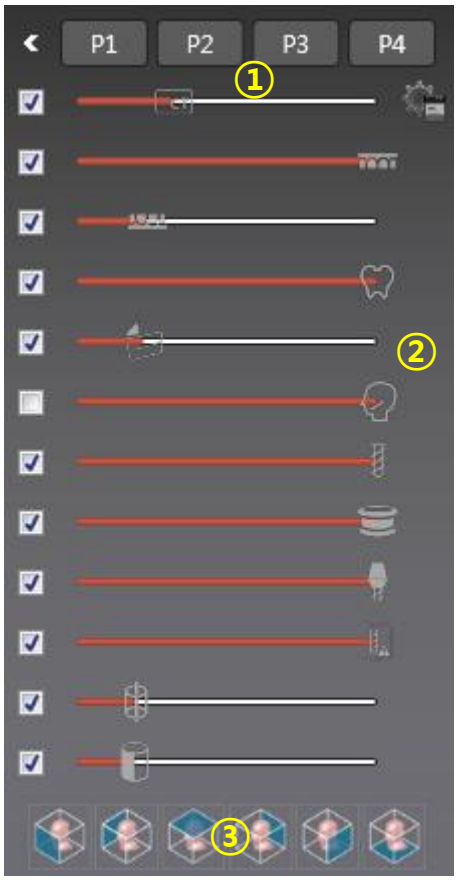
button to save all images in the list. Click 

button to delete all images in the list. Click  button to use footnote function.



The images in the list are exported with the footnote as a report.

14 Visualization Option Panel



① Visualization Option Preset

② Visualization Option

③ Camera Orientation

14.1 Visualization Option Preset

User can save the current visualization option as preset and use it later. After setting the visualization option, click the preset number to be registered among P1/P2/P3/P4 on the pop up window that is appeared after clicking button. Click P1/P2/P3/P4 to adjust the corresponding preset later.

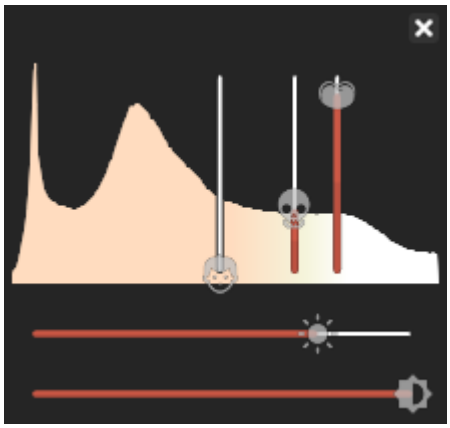
Visualization Option Preset of each step is maintained separately.

14.2 Visualization Option

Check the checkbox and move the slider bar to adjust the transparency of each item. Uncheck to the corresponding item on Main panel.

CT
Maxilla scan
Mandible scan
Crown
Panorama plain
Canal mesh
Implant mesh
Sleeve
Abutment
Implant safety zone
Implant axis
Drill Cylinder

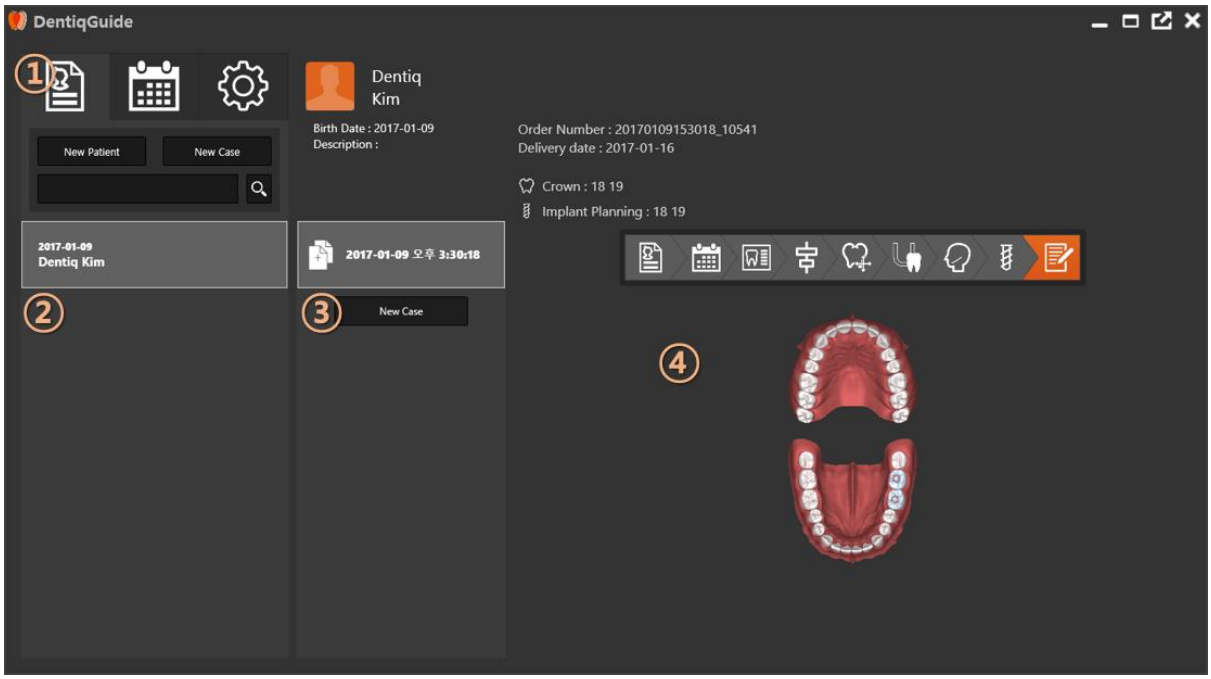
Click button to appear the SKIN/BONE/EMAMEL slider bar and histogram. Adjust the slider bar up and down to adjust the opacity. Use the 하단의 Brightness/Contrast slider bar on the bottom to adjust the Brightness/Contrast value of MPR.



14.3 Camera Orientation

Set the camera orientation that faces CT data. Click the icon among the orientations for front, back, up, down left, right to set the camera orientation of Main Panel.

15 Dental manager



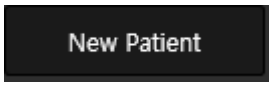
① Menu tab

② Patient list

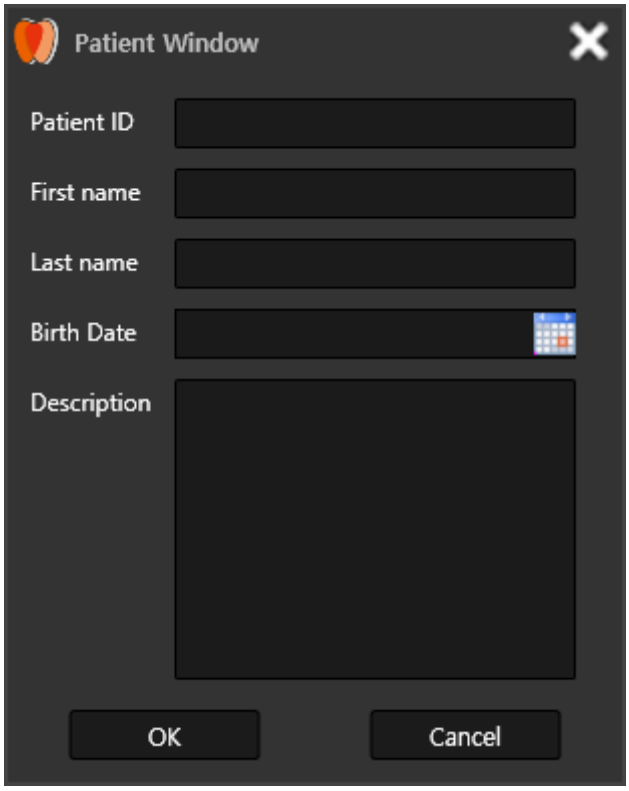
③ Case list

④ Project information panel

15.1 Add, Modify and Delete a patient

Click 

button to add a new patient.



Click OK button after entering patient information to add on the patient list. Search the added patient from searching functionality above the patient list.

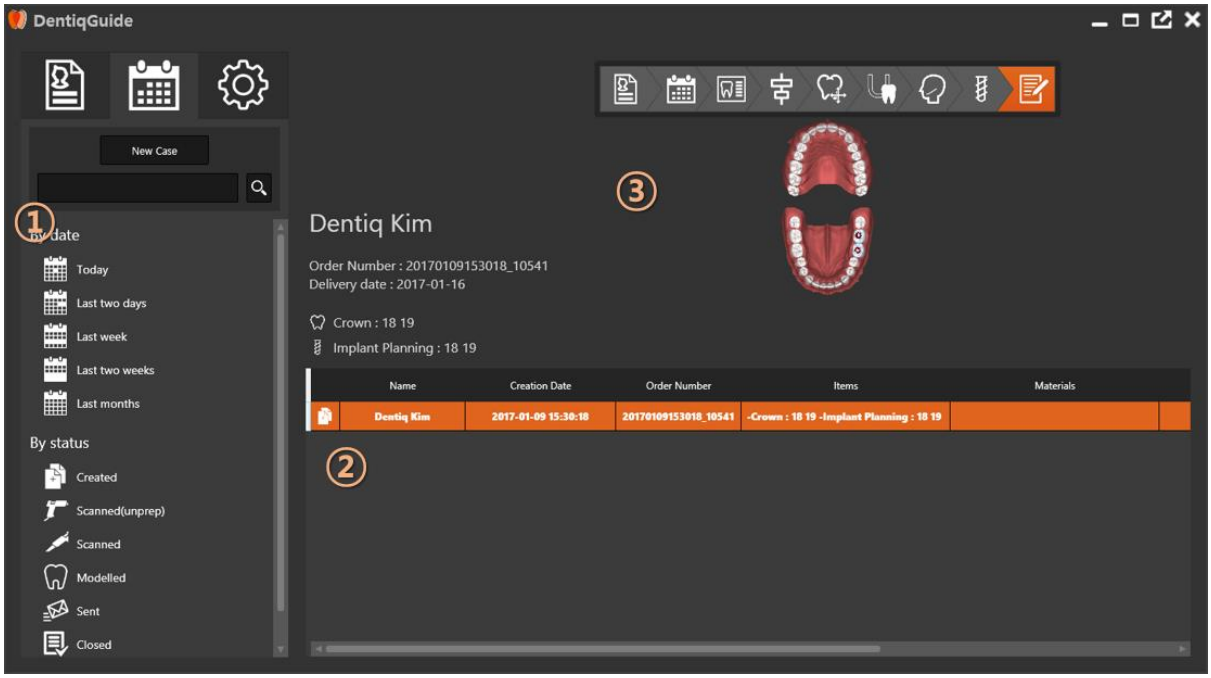
To modify the information, right click the patient on the patient list and click modify on the pop up menu. After modifying the information and click OK button to save the modified information.

To delete the information, right click the patient on the patient list and click delete on the pop up menu. To delete all information, right click on the patient list and click delete all on the pop up menu.

15.2 Create, Delete case and Export project

Click 

button on the upper side of search patient panel or on the case list to create a new case. To delete the created case, click delete button on the pop up menu that is appeared when right clicking. User can export the saved project by right clicking the target case. Select the case to display the progress, surgical planning information, order number and date of the saved project on the project information panel.



① Classification panel

② Case list view

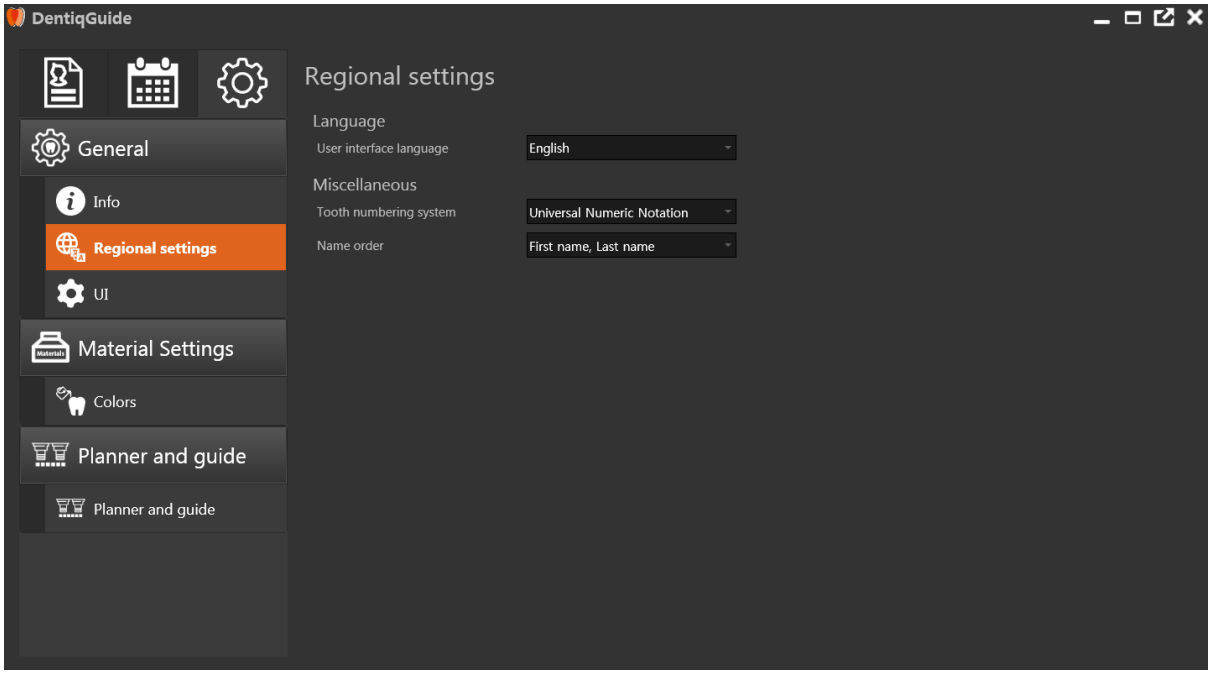
③ Project information panel

Click the each classification standard to display the corresponding case only on case list view. ('Created' is supported only in 'By status'.)

Left click the target case on case list view to display the saved project information on project information panel.

If user want to load the project that is saved from outside, click Import project on the popup menu that is appeared when right clicking on case list view. User can adjust Delete case and Export project on pop up menu.

15.3 Configuration



Check the program information and set various menu like language, UI, Colors, planner/guide and so forth.

16 Shortcut key

16.1 Common

ESC: Close window

Undo: Ctrl + Z

Redo: Ctrl + Y

16.2 Alignment

Camera synchronization: C

Remove all points: Move the mouse on the corresponding screen + D

Show Grid: G

Line/Distance: L

3D objects on MPR: M

Rotation: R

16.3 Crown placement

Select/Deselect multiple crowns: Ctrl + choose teeth with mouse

16.4 Draw curve

Reset curve: R

16.5 Nerve setting

Delete canal: R

Camera position restoration (2D panning state): Mouse cursor on 2D+ P

16.6 Implant placement

Open implant library when changing current implant: I

Close implant library: ESC

Rotate sectional plane on implant axis: Ctrl + Mouse wheel

Sleeve library: S

Implant grouping: G

Implant custom safety zone: Z

MPR tool – Clipping plane: Mouse cursor on 2D + L

MPR tool – Move camera to implant center axis: Choose implant + F

MPR tool – Line/Distance: Mouse cursor on 2D + L

MPR tool – Angle between two lines: Mouse cursor on 2D + A

MPR tool - HU value: Mouse cursor on 2D + H

Camera position restoration (2D panning state): Mouse cursor on 2D+ P

Implant tool – Implant clipping: 1

Implant tool – Distance of two implants: 2

Implant tool – Axis angle of two implants: 3

Implant tool – Distance of implant and nerve: 4

Implant tool – Distance of implant and scan data: 5

16.7 Report

Export project: S

Show surgical report: P