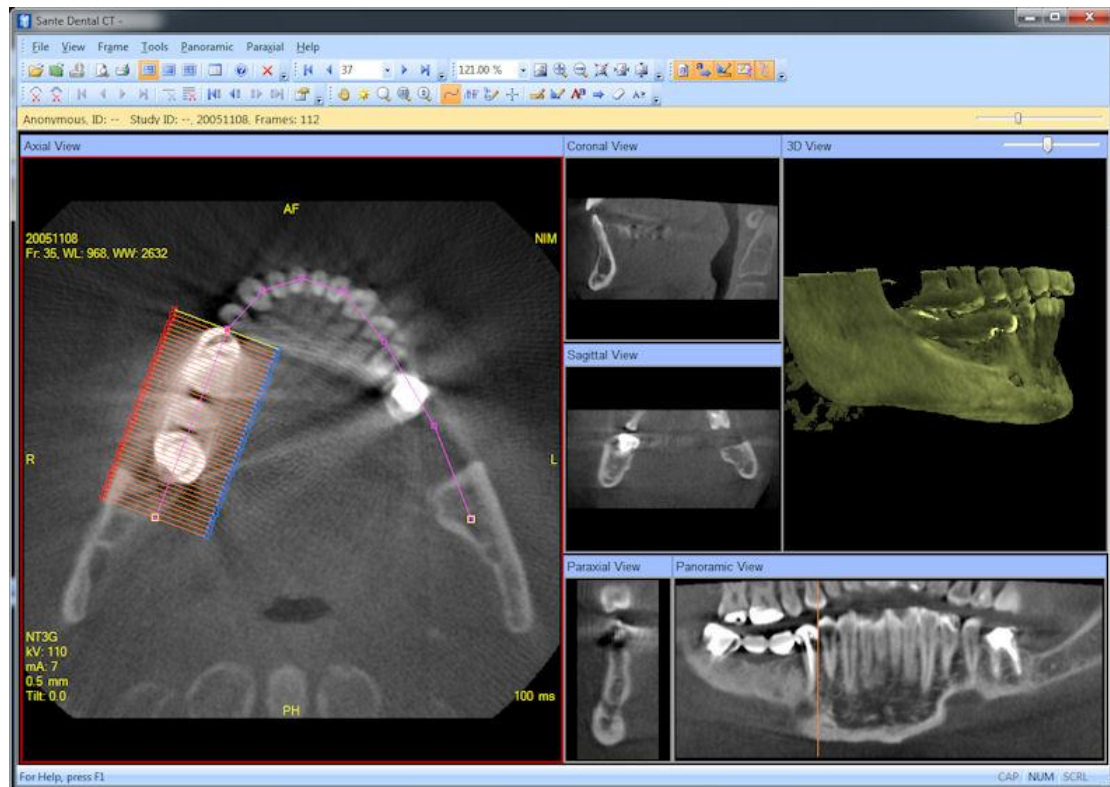


# Sante Dental CT

## Quick start guide



The aim of the program is to create one or more curved multi-planar reconstructions from a volume of Dental CT slices. Curved multi-planar reconstruction (Curved MPR) is a very useful tool in Dental CT. A volume is built by stacking the axial slices one behind the other. Curved multi-planar reconstruction involves generating perspectives to the stack of axial slices so that panoramic images and images from paraxial cuts can be generated.

### Sante Dental CT's main features

- The program allows the user to insert many panoramic lines.
- The program can generate automatically paraxial lines perpendicular to segments of a panoramic line. The user can add paraxial lines manually as well.
- The program allows the user to perform measurements (length, angle) in the panoramic and paraxial images.
- The program allows the user to annotate the panoramic and paraxial images with texts and arrows.
- The program can print a synthesis of a panoramic image and its paraxial images.

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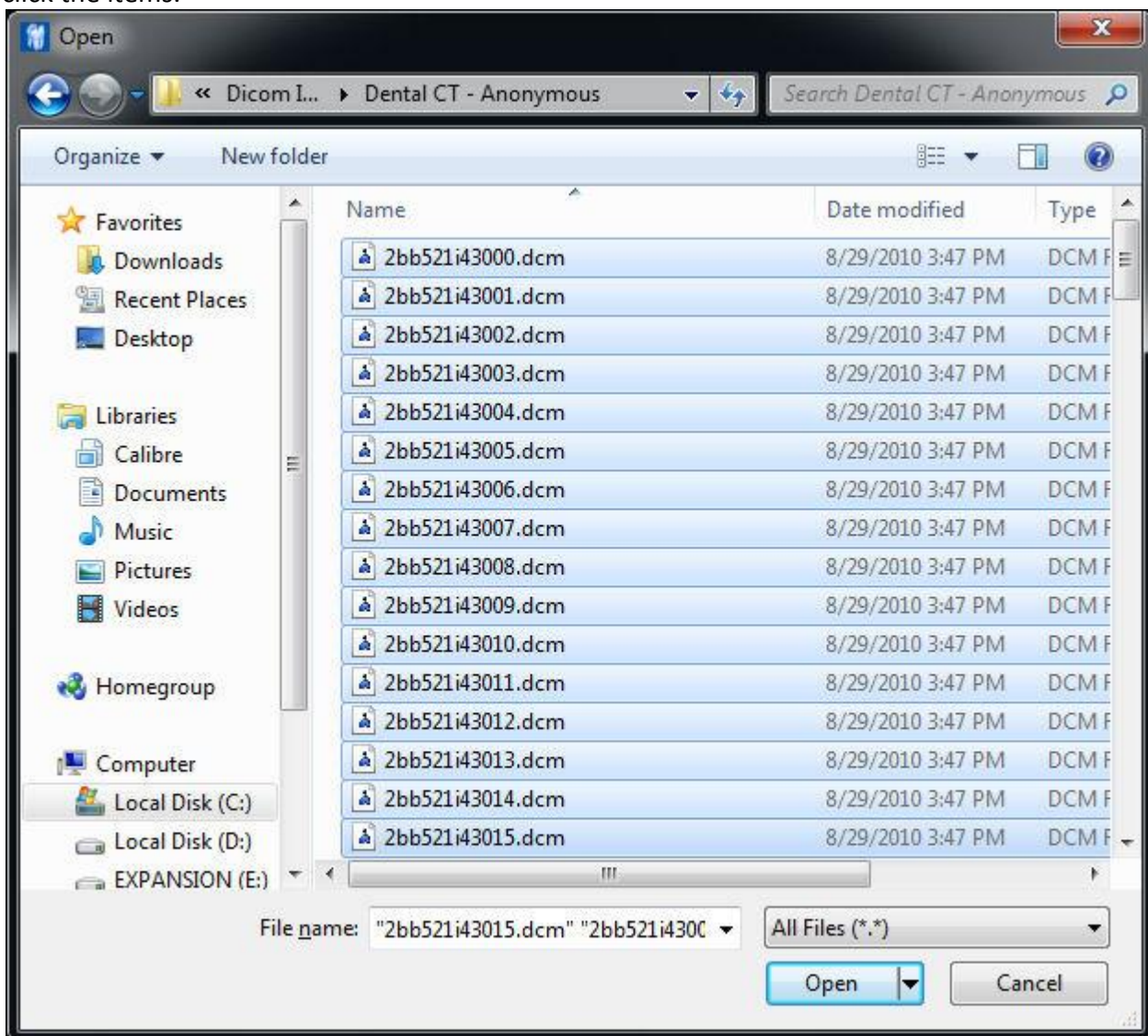
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## Open a series without a DICOMDIR file

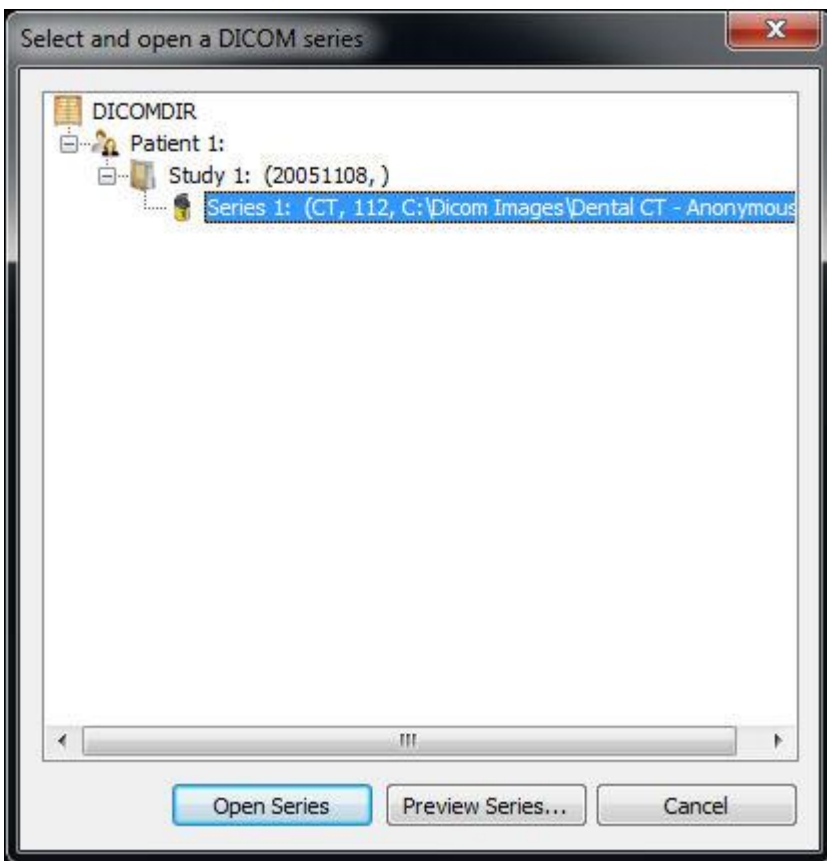
Select the File->Open command to open one or more files. The program works with a stack of frames. This stack of frames can be contained in a single (multi-frame) file or in many (single-frame) files. When the user selects the File->Open command, the program appears a dialog box that allows the user to select one or more files.

There are several ways to select multiple files.

- To select a consecutive group of files, click the first item, press and hold down the Shift key, and then click the last item.
- To select multiple files that are near each other, drag the mouse pointer to create a selection around the outside of all the items that you want to include.
- To select non-consecutive files, press and hold down the Ctrl key, and then click each item that you want to select.
- To select all of the files in a folders, press and hold down the Ctrl key and then press the letter "A" (Ctrl+A). If you want to exclude one or more items from your selection, press and hold down the Ctrl key, and then click the items.

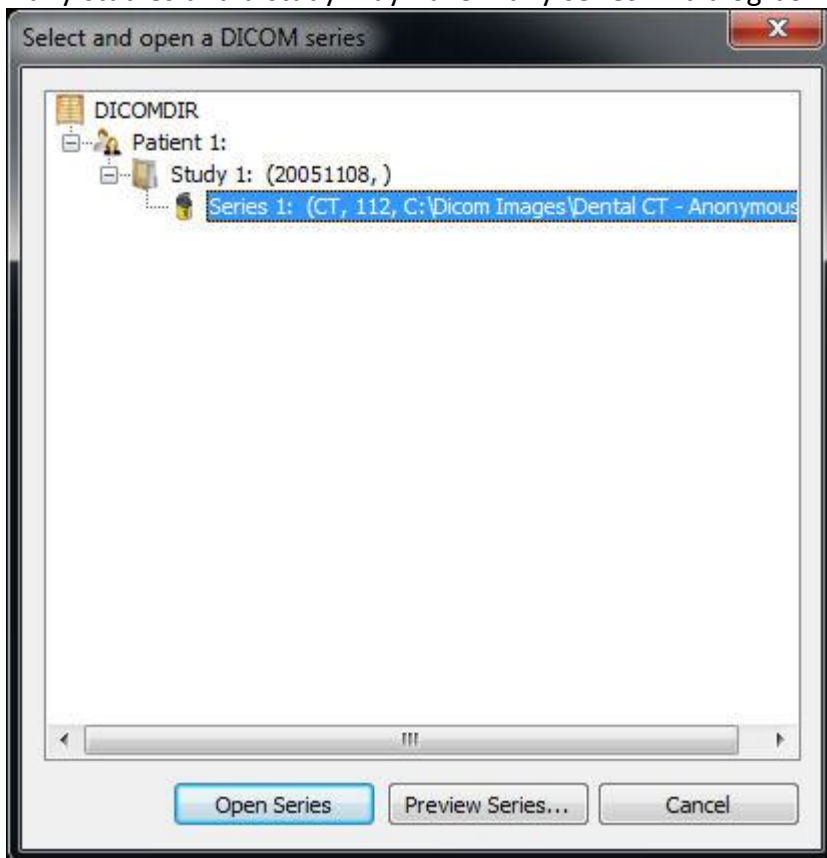


The program organizes the files in a hierarchical structure in the form of Patient-Study-Series. A patient may have many studies and a study may have many series. A dialog box allows the user to select the desired series.



### Open a series with a DICOMDIR file

Use the File->Open DICOMDIR command to open an existing DICOMDIR file and select a series. The DICOMDIR file contains an hierarchical structure in the form of Patient-Study-Series. A patient may have many studies and a study may have many series. A dialog box allows the user to select the desired series.

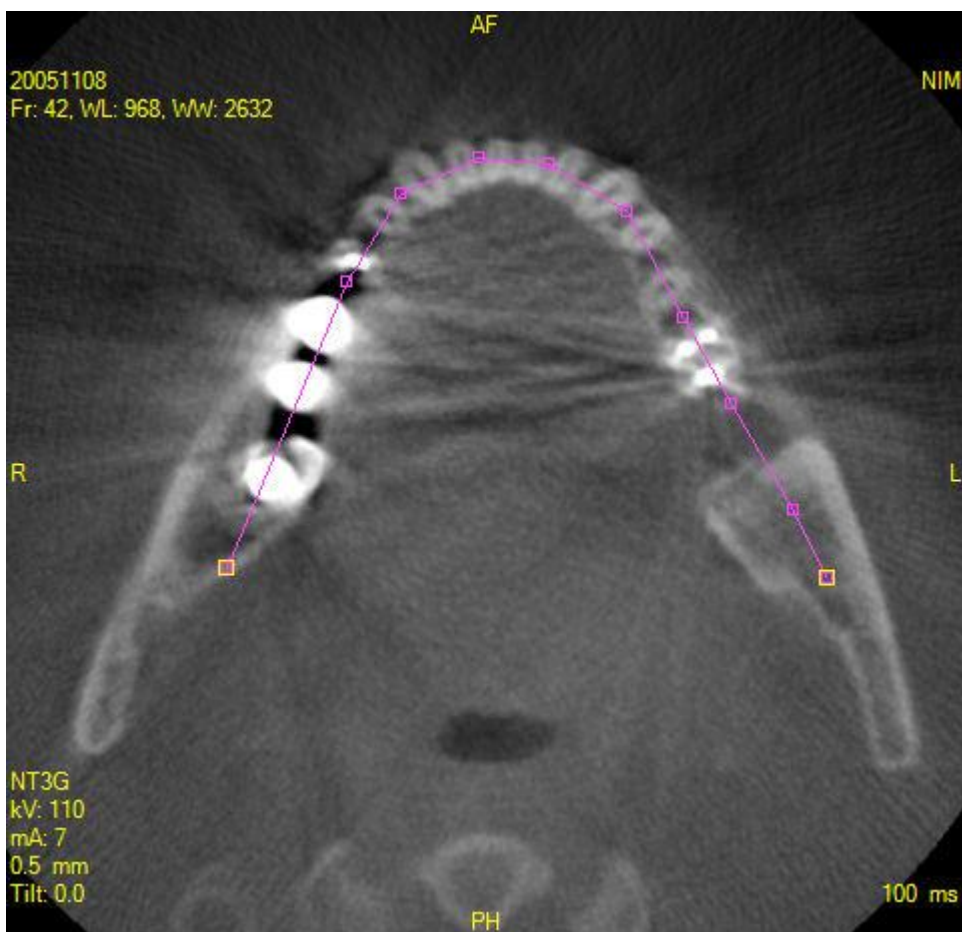


## Insert a panoramic line

The user can create a panoramic line by selecting the "Panoramic Line" tool from the tools menu.

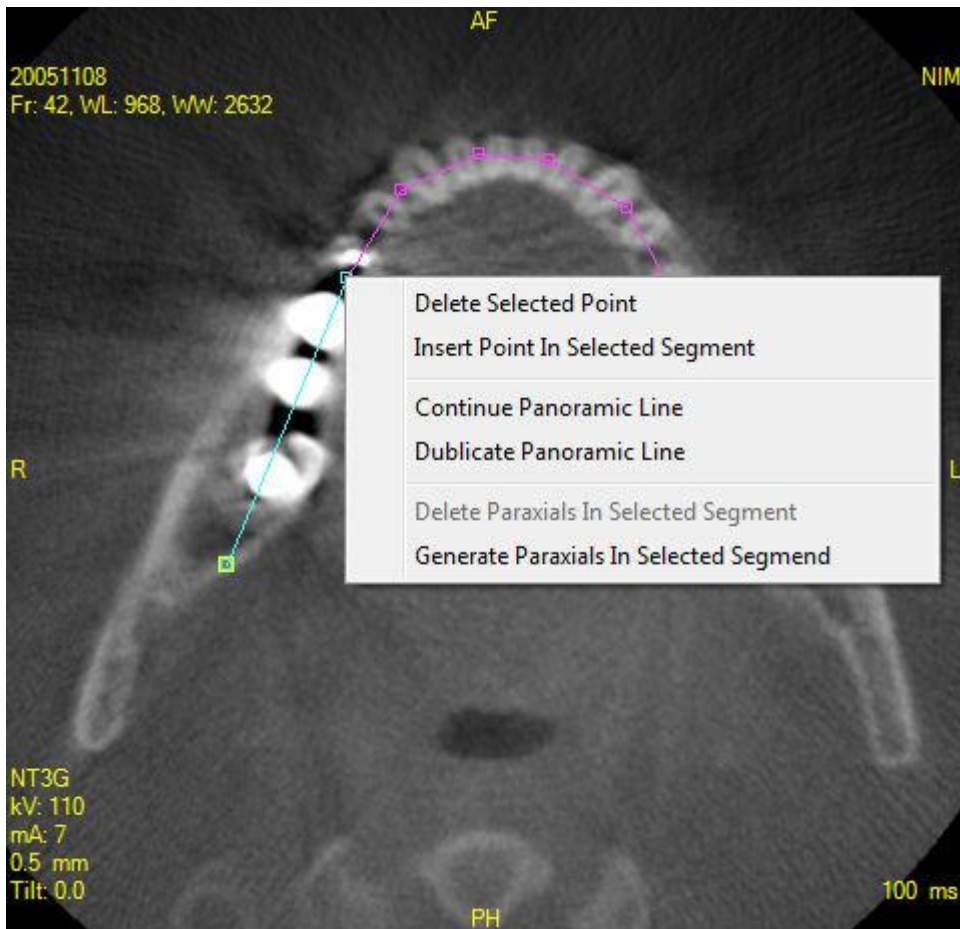


The panoramic line consists of many straight line segments. The user can create a panoramic line by selecting the Panoramic Line tool from the tools menu, and then by clicking the left mouse button on the desired points of the image, in the pane of axial slices. The user can finish the line creation by clicking the right mouse button on the last desired point. The program displays a "live view" of the panoramic image the same time that the user creates the panoramic line. This feature allows the user to follow easily specific structures such as nerves. The user can delete the last inserted point by pressing the <BACKSPACE> keyboard key, or cancel the line insertion by pressing the <ESCAPE> keyboard key.



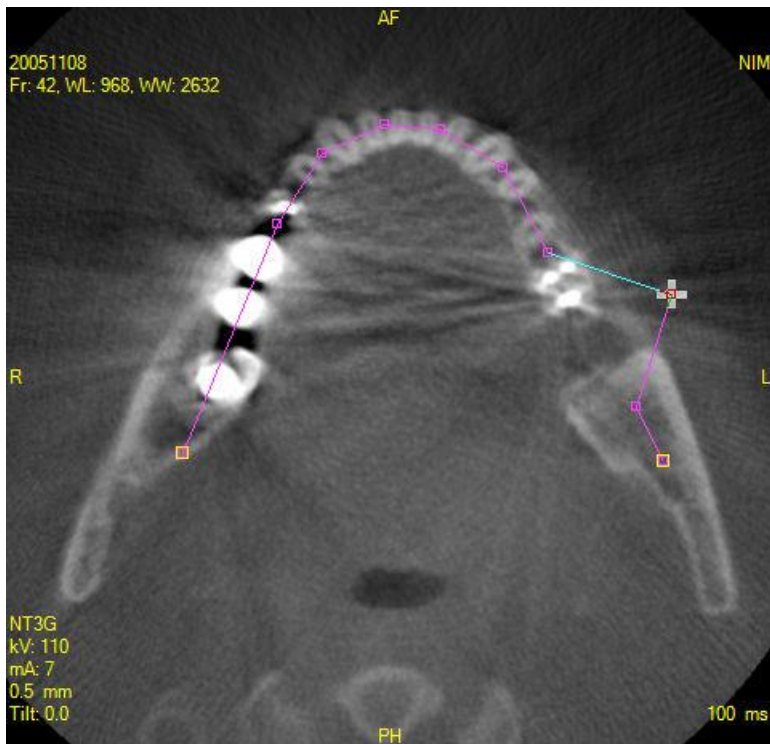
## Modify a panoramic line

The user can modify a panoramic line by selecting the Panoramic Line tool from the tools menu, and then by clicking the right mouse button over a panoramic point. The selected panoramic segment is highlighted and a popup menu is appeared. The menu command "Delete Selected Point", deletes the selected point, and the menu command "Insert Point In Selected Segment" inserts a new point in the middle of the selected (highlighted) segment. The menu command "Continue Panoramic Line" allows the user to continue a finished panoramic line from its last point.



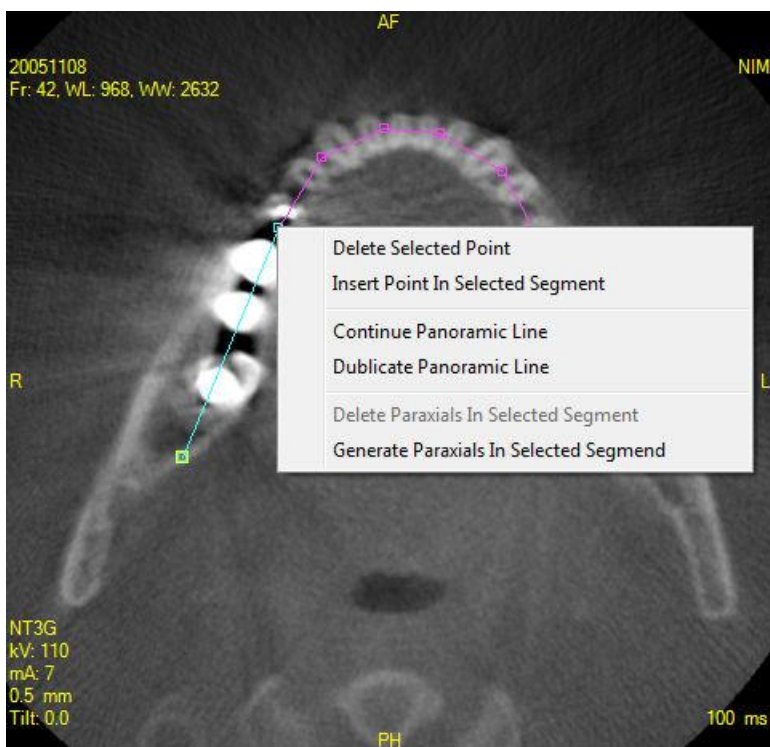
### Move a point of a panoramic line

The user can move a point of a panoramic line to new a position, by selecting the Edit Lines tool from the tools menu, and then by clicking the left mouse button on a panoramic point. After that, the user cans drag-and-drop the selected point to a new position.

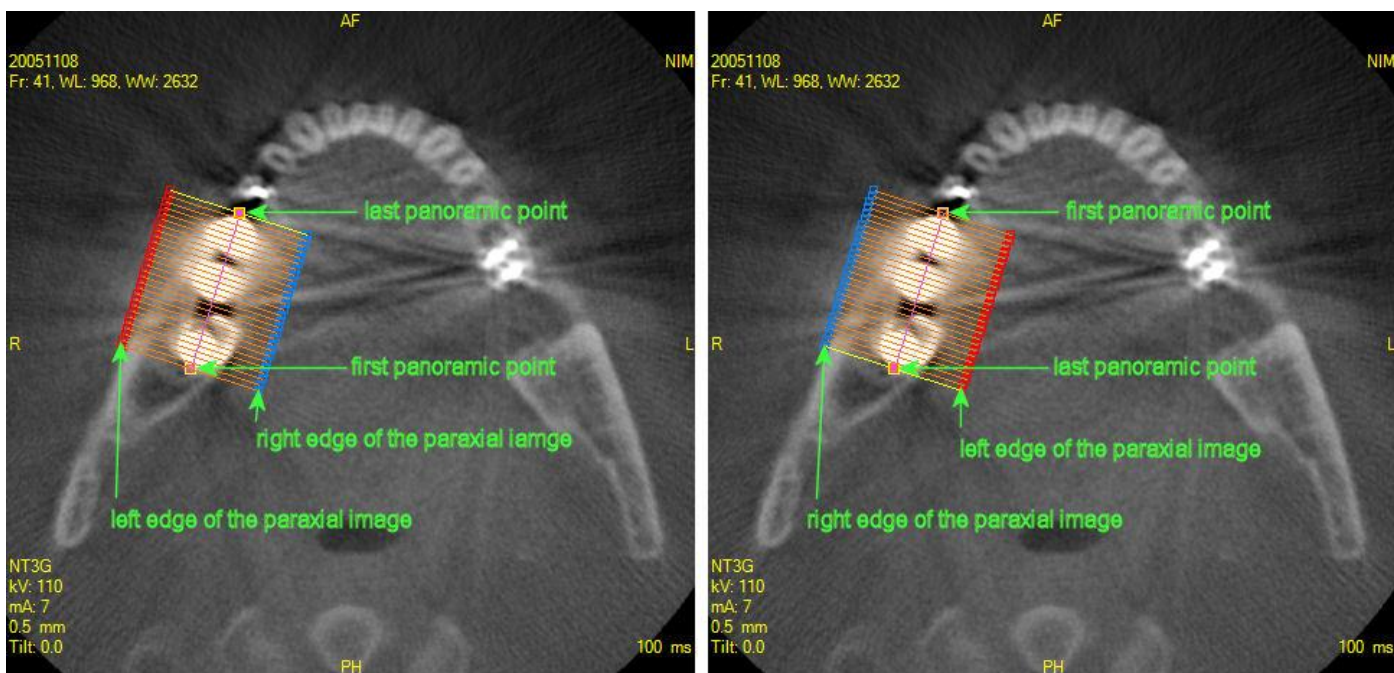


## Generate paraxial lines

The user can generate paraxial lines perpendicular to a segment of a panoramic line, by selecting the "Panoramic Line" tool from the tools menu, and then by clicking the right mouse button over a panoramic point. The selected panoramic segment is highlighted and a popup menu is appeared. The menu command "Generate Paraxials In Selected Segment" generates the paraxial lines, and the menu command "Delete Paraxials In Selected Segment", deletes all existed paraxial lines of the selected segment.



The user can insert a panoramic line with a clockwise manner or with a counter-clockwise manner. The manner of the insertion of the panoramic line determines which edge of the paraxial line is the left edge of the paraxial image and which is the right edge:

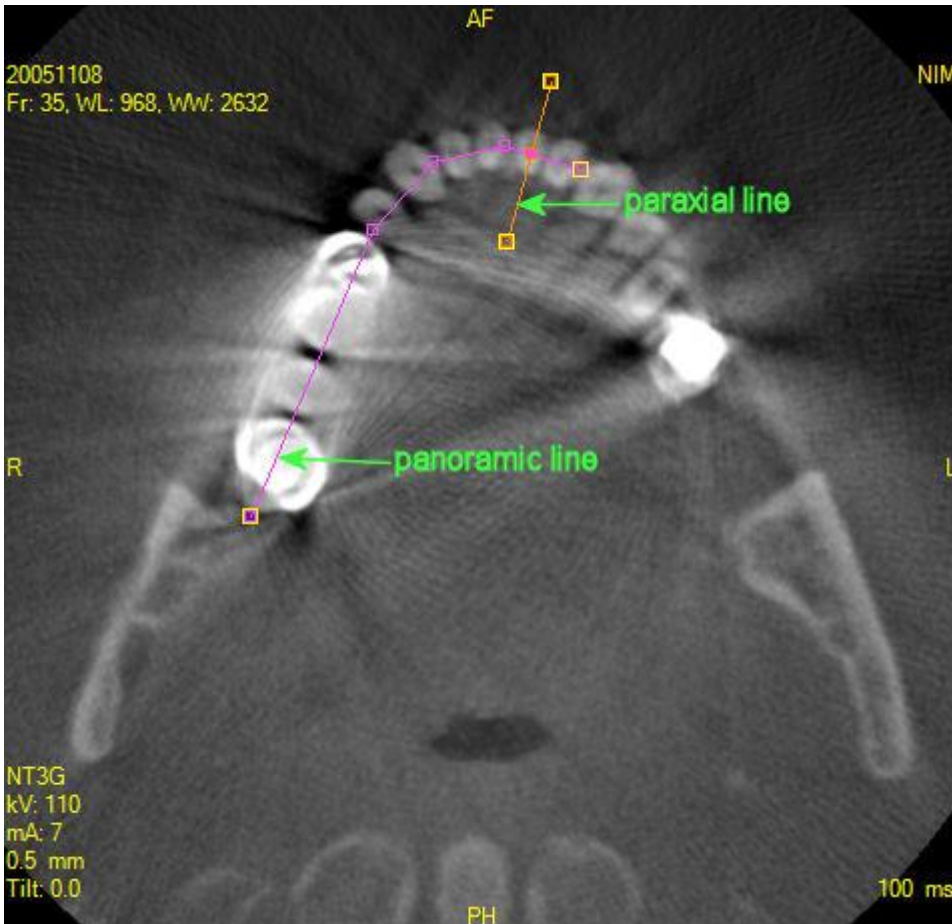


## Insert paraxial lines manually

The user can create a paraxial line by selecting the Paraxial Line tool from the tools menu.



Every paraxial line belongs to a panoramic line, thus this tool is not selectable if there is no any panoramic line. The paraxial line consists of one straight line segment. The user can create a paraxial line by selecting the "Paraxial Line" tool from the tools menu, and then by clicking the left mouse button on the two desired points of the image, in the pane of axial slices. The user can cancel the line insertion by pressing the <ESCAPE> keyboard key.

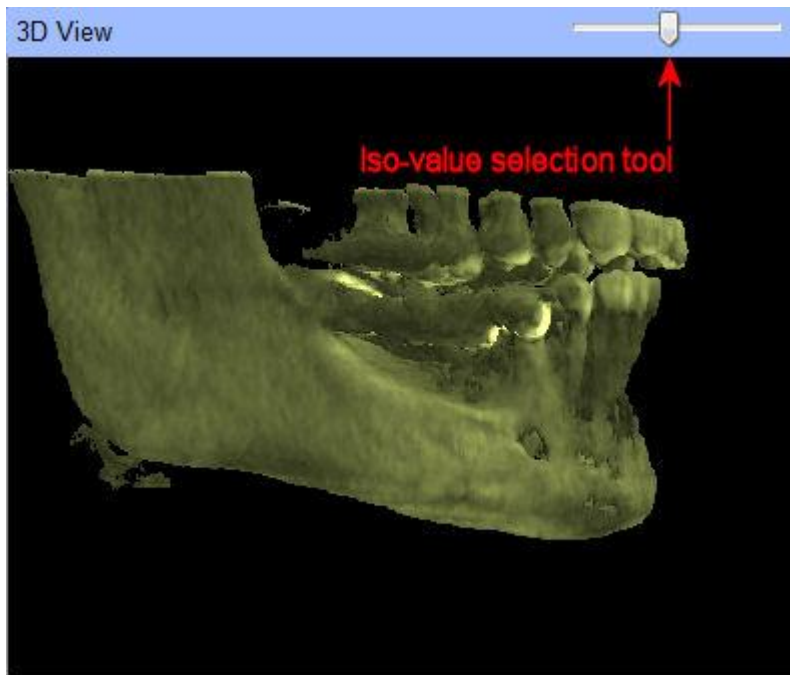


## Move a point of a paraxial line

The user can move a point of a paraxial line to new position, by selecting the [Edit Lines](#) tool from the tools menu, and then by clicking the left mouse button on a paraxial point. After that, the user can drag-and-drop the selected point to a new position.

## The 3D Window

The program displays a 3D reconstruction of the volume, by use of "marching tetrahedrons" technique. Marching tetrahedrons is a computer graphics algorithm for extracting a polygonal mesh of an iso-surface from a three-dimensional scalar field (voxels). An iso-surface is a surface that represents points of a constant value (the iso-value) within the volume. The user can select the iso-value from the upper-right slider control.



**To rotate around x axis:** press and hold down the left mouse button and move the mouse in up-down direction

**To rotate around y axis:** press and hold down the left mouse button and move the mouse in left-right direction

**To rotate around z axis:** press and hold down the right mouse button and move the mouse in left-right direction

**To zoom in and out:** press and hold down the right mouse button and move the mouse in up-down direction

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