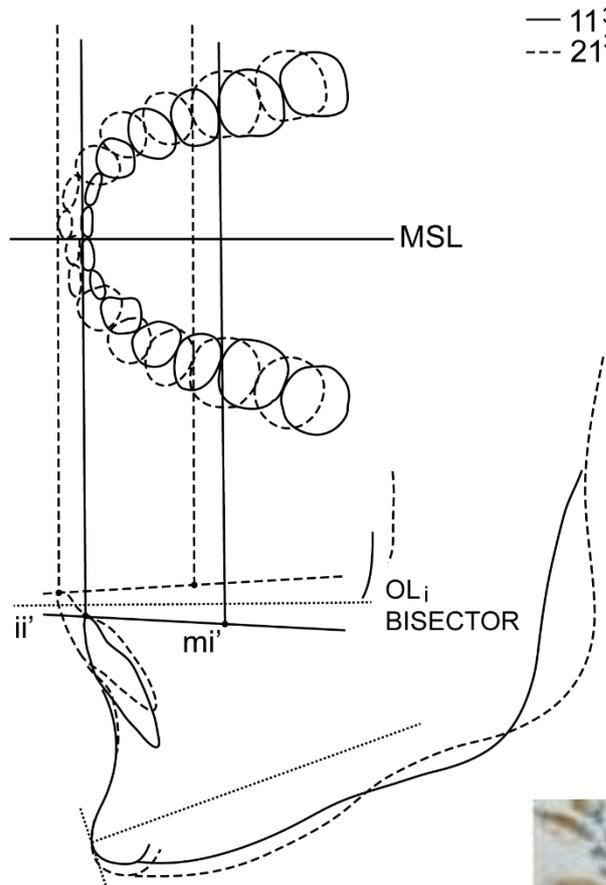# Some thoughts on the benefits of including Occlusograms in the Cephalometric analysis of Growth and Treatment.

The original decision to include Occlusograms in the Tiops program was inspired by the ideas of Professor Björk in connection with 'Cephalometric Analysis of Growth and Treatment', and are described in:
http://tiops.com/downloads/Articles/BjorkCephalometricGrowthAnalysis.pdf.
from where this illustration originates:

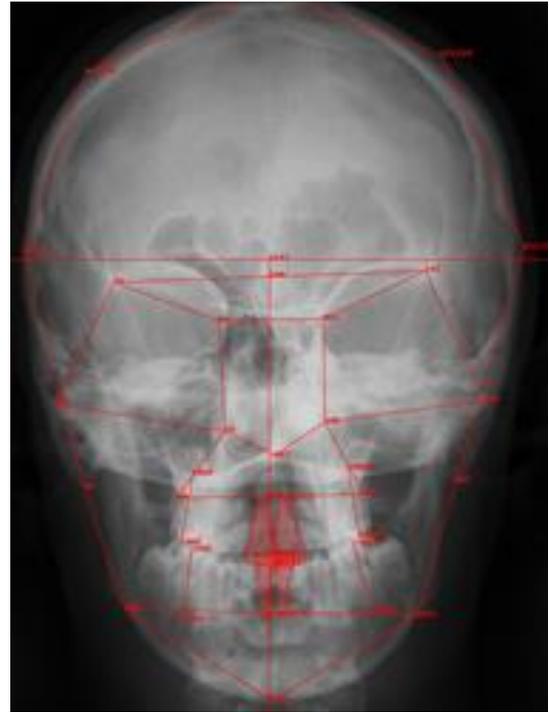**What can we learn by including the occlusogram?**

1. One of the most important benefits of including occlusograms of the study casts is that we now can study the occlusal changes in all three dimensions. Information about the sagittal (horizontal) and vertical changes of the dentition, we can get from the lateral headfilm, but the transverse changes only from the occlusogram.

2. By including the occlusograms in the cephalometric analysis, we can get a more precise idea of the transverse changes of both the posterior and anterior teeth. Expansion of the posterior teeth and midline changes of the anterior teeth can now also be more precisely determined.

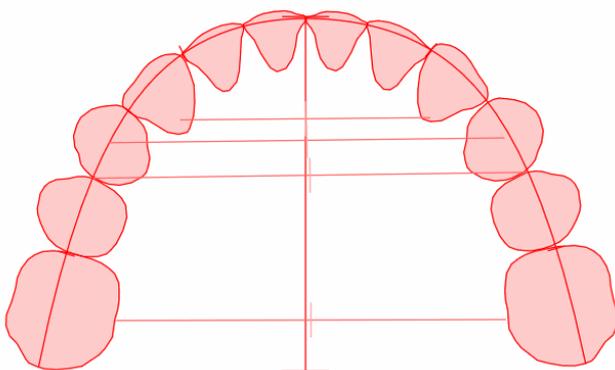Do We Really Know where the Molar Teeth are on the Lateral Headfilm?

About midlines

To what degree the clinician choses incorporate correction of the midline in the treatment plan is a personal choice. However, it is important to analyze the midline situation in order to be able to make this decision. An important part of the analysis is to distinguish between the Facial and Dental midlines, as seen in the Frontal Aspect and the Dental Arch Midline or Symmetry Axis.

The patients Facial Midline, as seen in the Frontal Aspect, is best diagnosed using a Frontal Photo or a Frontal Cephalometric Headfilm. It is important that the face is correctly aligned without any rotation.
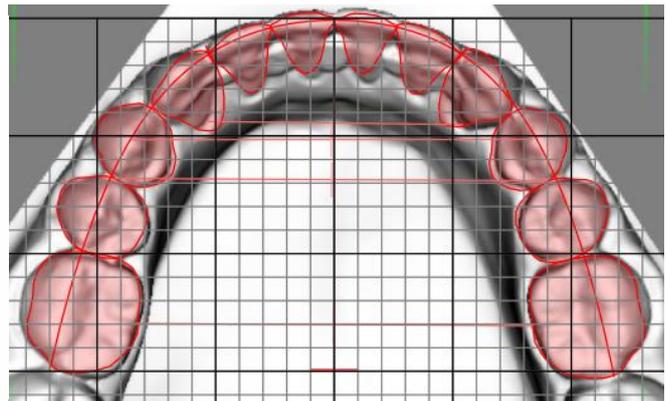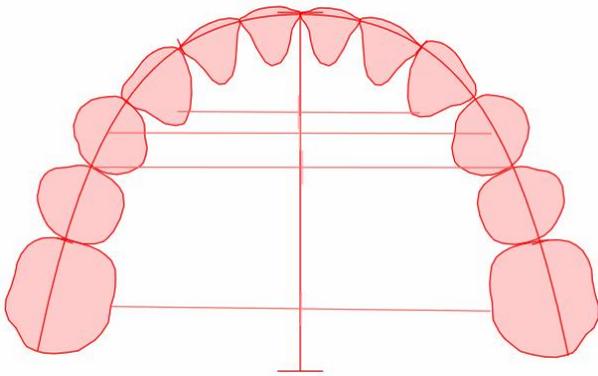

About Arch Analysis Midline Corrections

In relation to performing an Arch Analysis It is usually a good idea to check the Arch Midline or Symmetry Axis placement before making any corrections to the molar position (as any "wrong" molar position may be due to an incorrectly located midline). Do not spend too much energy on precisely defining the midline at the beginning of the registration procedure as it is easier to correct the midline after all teeth have been digitized. To make a necessary correction of the midline placement, use the function View/Show Symmetry Guides, and open the Points list under Upper/Lower Arch and scroll down to the landmark ref1
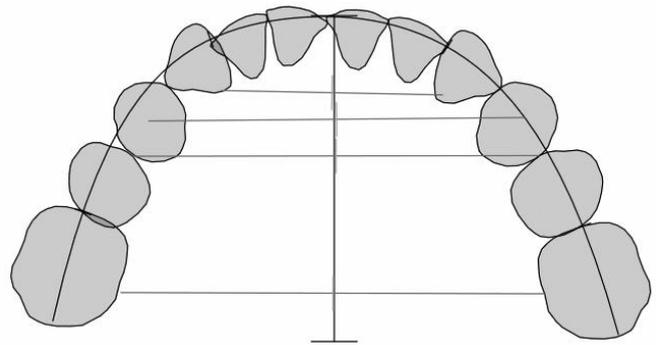

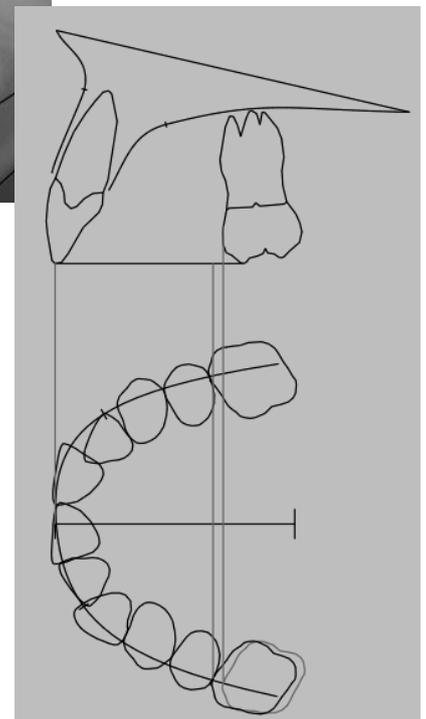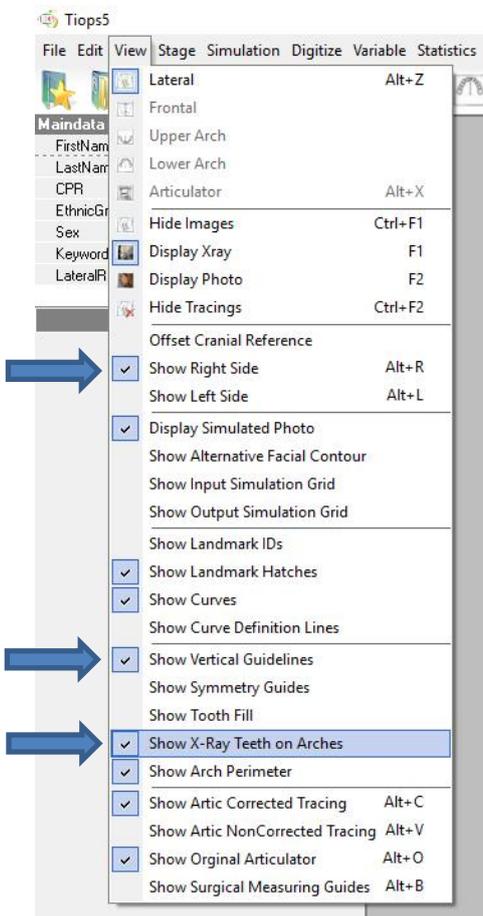Before correction   During correction

After correction

Example showing the incisal midline
not coinciding with the symmetry axis

About correcting the molar position on the cephalometric headfilm using the dental arch tracings

If the initially digitized molar position on the Lateral Analysis does not match the position on the occlusogram, it can be corrected using the following procedure.

When selecting the function View/Show X-Ray Teeth on Arches, guide Lines showing the mesial aspects of the Upper and Lower Arch Analysis Molars will now automatically appear in the Lateral Analysis displayed in the Main Window. This is in addition to the shaded Lateral Analysis Molars, that appear in the Jaw View Window. This function works in combination with the function View/Show Right/Left Side that make separate corrections of either side possible. This function works when the molar on only one side has been registered. However, it also works when both the Right and Left Molars are included in the Lateral Analysis.

Before correction:
The Cephalometric
Upper Right Molar
is placed too far
distally in relation
to the Right Molar
at the Arch
Analysis

In order to make the necessary correction open the Points list under Xray and scroll down to the landmark msm.

To maneuver the tooth:
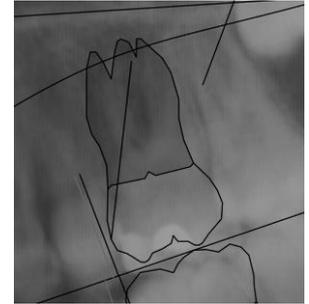A. MouseMove to rotate
B. Shift+MouseMove to translate

Procedure:
1. Place the tooth correctly using A and B

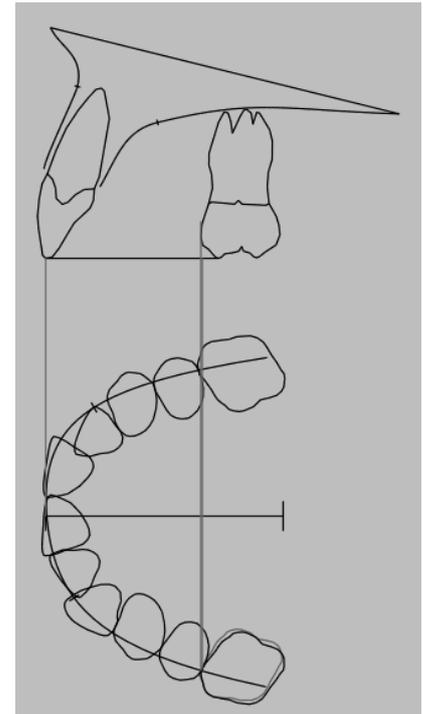2. LeftClick to lock in position

The tooth will always be registered in the equal size irrespective of the cursor position along the tooth axis

msm
rsm   Tooth Positioning Procedure
                      Upper Molar

When the molar is corrected in the Main Window, it is automatically updated in the Jaw View window.
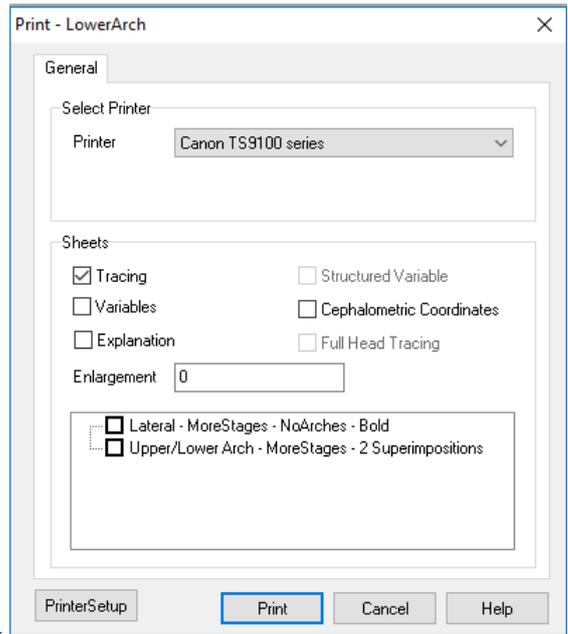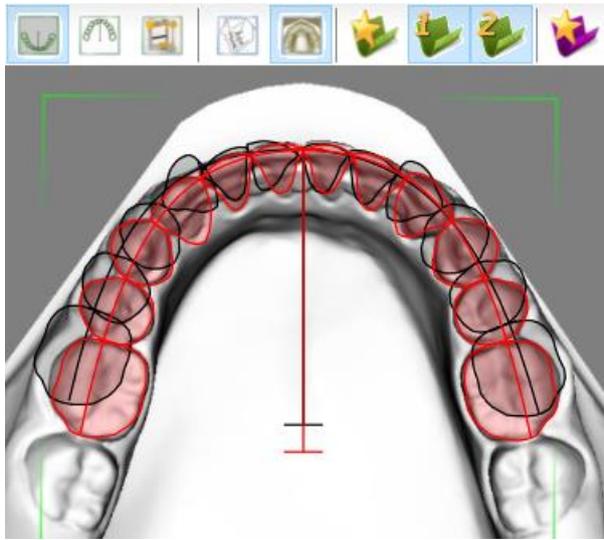

About Printouts

The Tiops Program offers four different printout options of the Arch Analysis.

1. Upper or Lower Arch with one or more Stages.
2. Upper/Lower Arch – OneStage sheet.
3. Occlusograms superimposed on different reference landmarks called the Upper/Lower Arch – MoreStages – 2 Superimpositions sheet.
4. Printout of the Arch Variables

To print the appropriate sheet(s) just select the desired stages and open the actual analysis in the Main window.

Note: Any Enlargement factor can be selected.

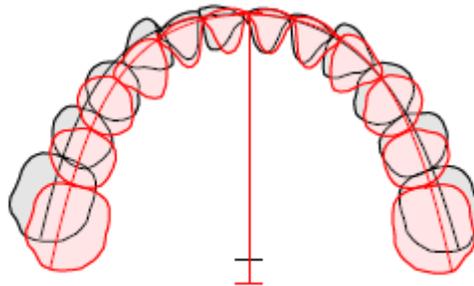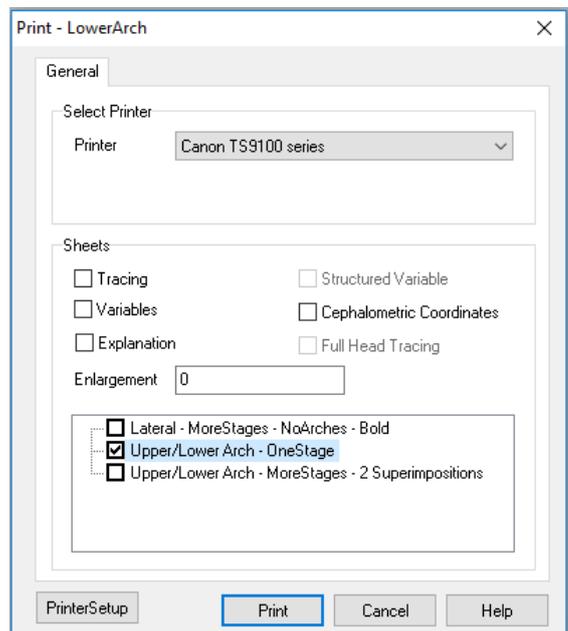1. Printout of the Upper or Lower Arch including one or more Stages.

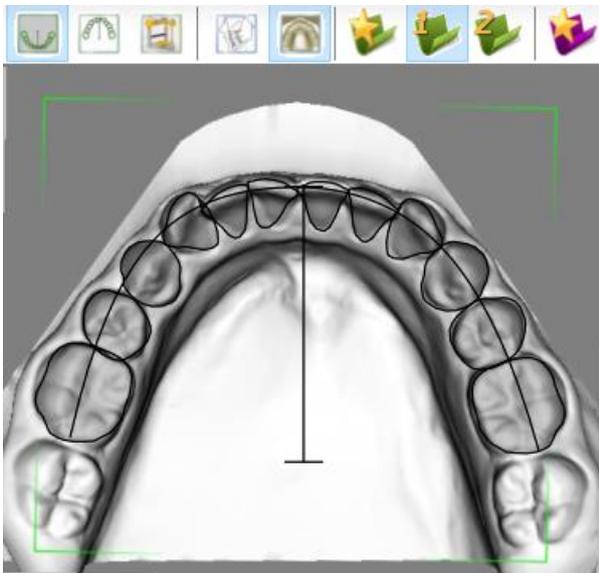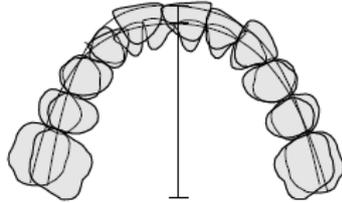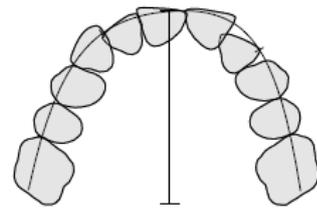Enlargement: 0%   Stage 1 (MA)   - 07-12-2007 SkelAge   14:3
                   Stage 2 (TA)   - 09-04-2010 SkelAge   16:8

2. Printout of Upper/Lower Arch – OneStage

Enlargement: 0%   Stage 1 (MA)   - 12/7/2007 SkelAge   14:3

Note: Upper and Lower Arch superimposition using the cephalometric relations

r6 MesDis	mm	10.0	10.3	-0.4				r6 MesDis	mm	9.2	10.2 -1.7
r5 MesDis	mm	7.1	7.1	-0.1				r5 MesDis	mm	6.2	6.5 -0.6
r4 MesDis	mm	6.9	6.8	0.1				r4 MesDis	mm	6.8	6.6 0.4
r3 MesDis	mm	6.2	6.6	-1.5				r3 MesDis	mm	7.5	7.5 -0.1
r2 MesDis	mm	5.6	5.9	-0.9				r2 MesDis	mm	7.0	6.8 0.4
r1 MesDis	mm	5.4	5.5	-0.3				r1 MesDis	mm	8.3	8.7 -0.6
l1 MesDis	mm	5.4	5.5	-0.4				l1 MesDis	mm	8.3	8.7 -0.6
l2 MesDis	mm	5.5	5.9	-1.2				l2 MesDis	mm	7.0	6.8 0.3
l3 MesDis	mm	6.0	6.6	-2.0							
l4 MesDis	mm	6.5	6.8	-0.5				l4 MesDis	mm	6.6	6.6 0.0
l5 MesDis	mm	6.5	7.1	-1.3				l5 MesDis	mm	6.4	6.5 -0.1
l6 MesDis	mm	10.3	10.3	0.1				l6 MesDis	mm	9.7	10.2 -0.8

LoAntDepth	mm	9.0	13.0 -3.1	LoAntDepthDiscr	mm	2.2	0.0 1.2	UpAntDepth	mm	9.8	16.0 -4.5
LoAntWidth	mm	32.5	31.5 0.6	LoAntWidthDiscr	mm	2.7	0.0 0.9	UpAntWidth	mm	29.8	31.5 -1.2
LoPostWidth	mm	50.0	44.8 2.1	LoPostWidthDiscr	mm	6.1	0.0 2.0	UpPostWidth	mm	44.0	44.8 -0.3
Space1To5R	mm	-1.2	0.0 -0.6					Space1To5R	mm	-3.9	0.0 -1.9
Space1To5L	mm	0.1	0.0 0.1								
Pred Space1To5R	mm	-1.6	0.0 -0.8					PredSpace1To5R	mm	-4.4	0.0 -2.2
Pred Space1To5L	mm	-1.4	0.0 -0.7					PredSpace1To5L	mm	-4.5	0.0 -2.2

3. Printout of occlusograms superimposed on different reference landmarks called the Upper/Lower Arch – MoreStages – 2 Superimpositions sheet.

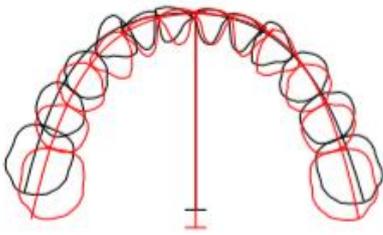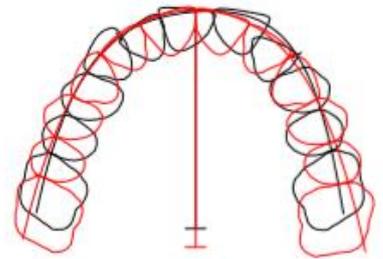Enlargement: 5.6%   Stage 1 (MA)   - 07-12-2007 SkelAge   14:3
                      Stage 2 (TA)   - 09-04-2010 SkelAge   16:8

Overlay at Model Incisor

Overlay at Cephalopmetric Incisor