

A New Tracing Method to Predict Changes of the Mandibular Landmarks Following Superior Repositioning of the Maxilla

Ahmad Akhondi MS,¹ Piroozmand F.²

¹ Assistant Professor, Dept of Orthodontics, Faculty of Dentistry, Tehran University of Medical Sciences, Tehran, Iran

² Orthodontist

The surgical approach to adult patients who have vertical maxillary excess almost always includes a LeFort I osteotomy to superiorly reposition the maxilla. Maxillary segmentalization, some posterior or anterior movement of the maxilla, mandibular ramus osteotomy to advance or set back the mandible, and inferior border osteotomy to reposition the chin are added as the requirements of the individual case dictate. Following superior repositioning of the maxilla (SRM), or at least posterior part of the maxilla, via total or segmental maxillary osteotomy, the mandible rotates upward and forward around the horizontal condylar axis.⁽¹⁾

To predict changes of the mandibular landmarks following SRM, different methods have been proposed, including computer and manual prediction methods.^(2,3)

In this article a new and simple method is presented for this purpose.

Method of Prediction

Following SRM and mandibular autorotation, anterior extension of the mandibular functional occlusal plane should be positioned 1 to 3 mm below the upper lip.⁽⁴⁾

This occlusal plane position provides approxi-

mately 2 to 4 mm of upper incisor exposure below the upper lip. It is imperative that the original cephalometric radiograph be taken with the lips in repose, or this amount of rotation will be inaccurate. After tracing the mandibular functional occlusal plane, a point 2 mm (range= 1 to 3 mm) below the upper lip is chosen (X) (Fig. 1). In cephalometric predictions, the center of mandibular condyle is usually considered as the center of mandibular autorotation,⁽¹⁾ though some researchers believe that there is a distance between the center of rotation and the center of the condyle.⁽⁵⁻¹¹⁾

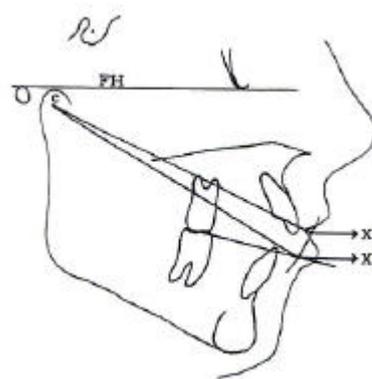


Fig. 1- Cephalometric tracing illustrating the basic landmarks and lines employed in determining the angle XCX' . In our method, choosing either one of the centers does not make a marked difference in

the final result, so to make it reproducible, we assumed the center of mandibular condyle as the center of rotation. From the center of the condyle (C), a curve with a radius as great as CX is drawn by dividers. This curve intersects the functional occlusal plane in X'. After SRM, the angular change of the mandible, caused by autorotation, is equal to the angle XCX' (Fig. 1). It is obvious that all the mandibular landmarks rotate the same degree in an upward and forward direction. To show the secondary position of any given mandibular landmark following SRM, first a line is drawn from the primary position of the landmark to the center of the condyle (C). Then a second line is drawn from point C with an angle equal to XCX' with the first line. The length of the second line should be the same as the first one. The end of the second line shows the secondary position of that particular landmark.

Example

Figure 2 shows the cephalometric tracing of a long face patient with class II open bite malocclusion. The length of the upper lip and its relation with the upper incisor are normal. Following superior repositioning of the posterior maxilla, the angular change of the mandible is 4° ($XCX' = 4^\circ$).

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The secondary positions of the lower molar (Lm), Menton (Me), Pogonion (Pog), and lower incisor (I), after mandibular autorotation, are shown as Lm' , Me' , Pog' , and I' respectively. It should be noted that vertical change of the lower molar is equal to the amount of superior repositioning of the posterior maxilla.

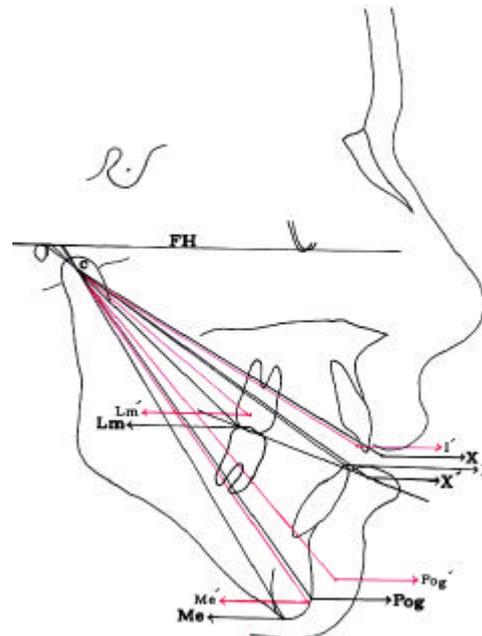


Fig. 2- Cephalometric tracing of a patient with Class II open bite malocclusion. Changes in Lm, Me, Pog & I can be easily predicted with the present method