The Combined Value of the Frontal Analysis and GROWTH PREDICTION

by Bradford Edgren, DDS, MS


Fig. 1a


Fig. 1b


Fig. 1c


Fig. 1d


Fig. 1e

A 12-year-old male presents in my office for an orthodontic evaluation. He has Class I malocclusion with completely blocked out maxillary canines and moderate to severe crowding in the lower arch. At first take, a four-bicuspid extraction treatment plan would appear to be appropriate. However, in my practice, I always take complete diagnostic records, including lateral, frontal, panoramic and hand-wrist radiographs on all my patients before committing to a particular treatment plan. These radiographs for each patient are always sent to Rocky Mountain Orthodontics Data Services for cephalometric tracing and analysis. The information I receive includes a Ricketts analysis of the lateral and frontal head films, a Ricketts forecast for dento-facial growth and visual norms for both the lateral and frontal analyses.

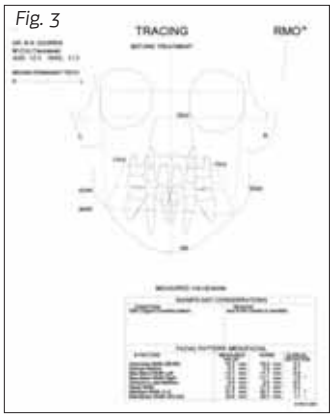
Fig. 1a-1e: Intra-oral, diagnostic photos demonstrating the blocked-out maxillary canines. Note the narrow upper arch form.

Fig. 2: Diagnostic panoramic radiograph. Note the impacted maxillary canines.


Fig. 2

Each patient's analysis I receive is specific for age, sex, gender and race. These four variables make it possible to individualize each patient's diagnosis and consequential treatment plan.

For this patient, the information from the cephalometric analysis revealed a significant skeletal lingual crossbite pattern due to both jaws. Skeletal lingual crossbite patterns do not



always reveal themselves with obvious posterior dental crossbites. It can be challenging to determine the presence of a skeletal lingual crossbite pattern when it appears that there is a normal transverse relationship between the upper and lower jaws without a frontal analysis. Many patients who appear to have a normal transverse skeletal relationship can have skeletal lingual crossbite patterns,[1] negatively affecting orthodontic treatment outcomes. The orthodontic patients we treat are three dimensional; the routine use of frontal analyses on orthodontic cases adds that third dimension. This can only enhance the orthodontic diagnosis and treatment planning process.

As this case demonstrates, skeletal lingual crossbite patterns are not just limited to a narrow maxilla. Posterior skeletal lingual crossbites can be the result of a wide mandible, which can be further exasperated by future excessive lower jaw growth. This patient's lateral analysis demonstrated a Class I skeletal relationship. However, his growth forecast to maturity indicated significant lower jaw growth over the next several years.

The maxillo-mandibular relationship two years after the start of treatment in an adolescent might not be the same at maturity. When growth is not taken into account, an orthodontic case treated to proper balance at age 12 can become a failed result at maturity. This is especially true in cases that are predicted to experience a large amount of mandibular growth during their teens. A decision was made to use rapid maxillary expansion followed by upper and lower fixed appliances to resolve this patient's crowding issues. The maxillary canines erupted into proper position producing this functional and aesthetic result. ■

Fig. 3: Frontal analysis demonstrating skeletal lingual crossbite pattern.
Fig. 4: Lateral analysis
Fig. 5: Growth forecast to maturity without orthodontic treatment.
Fig. 6: Superimposition of lateral cephalometric analysis upon the growth forecast to maturity demonstrating potentially excessive mandibular growth.
Fig. 7a-7e: Retention photographs of the patient's final result.
Fig. 8: Retention panoramic radiograph

1. *Miner R, Qabandi S, Rigali P, Will L. Cone-beam computed tomography transverse analysis. Part 1: Normative data. Am J Orthod Dentofacial Orthop 2012;142:300-7*

Author's Bio

Dr. Bradford Edgren earned both his Doctorate of Dental Surgery, as valedictorian, and his Master of Science in Orthodontics from University of Iowa, College of Dentistry. He is a diplomate, American Board of Orthodontics and an affiliate member of the SW Angle Society. Dr. Edgren has presented to numerous groups on the importance of cephalometrics, transverse discrepancies and upper airway obstruction. His articles have been published in both the *AJODO* and *American Journal of Dentistry.* Dr. Edgren currently has a private practice in Greeley, Colorado.