Just a few days prior to Raida’s* visit to my office for continuation of her orthodontic treatment, another child at school told her, “Your face is crooked.” It was only during the exam that the parents first heard this comment from their almost 12-year-old daughter. As with any child, these parents were troubled to hear that their daughter was being subjected to hurtful remarks. Comments like these are never good for self-esteem or confidence, especially at a young age. Facial deformities are very embarrassing, and a significant facial
asymmetry falls into this category. Asymmetries are often associated with head and neck syndromes. However, they can also occur, as in this case, with condylar hypoplasia.

Raída was a transfer patient from an orthodontist in another state. Clinical evaluation of the patient revealed a noticeable, superior cant to the occlusal plane on the right. Both maxillary first bicuspids were previously extracted. The maxillary and mandibular first molar relationship was Class I. Clinically the right canine relationship was Class III; the left canine relationship was Class I (Figs. 1a, 1b, 1c). Further evaluation of the patient demonstrated a significant mandibular asymmetry to the right and interlabial incompetence. She had discomfort and crepitus associated with the left temporomandibular joint and a significant opening deviation to the right.

Complete diagnostic records were taken including: mounted models, photographs, CBCT scan, carpal index with growth analysis, and lateral and frontal cephalometric analyses (Figs. 2 & 3). The CBCT scan and frontal analysis revealed a significant mandibular...
skeletal asymmetry to the right (Figs. 4 & 5). The midline of the mandible was displaced to the right 8mm and the lower incisors were subsequently inclined to the left. The frontal analysis also exposed a skeletal lingual crossbite pattern due to both the maxilla and mandible.

Evaluation of the right mandibular condyle from the CBCT scan demonstrated hypoplastic growth and poor condylar form. The right ramus was significantly foreshortened compared to the left (Fig. 6). Hypoplasia, defective formation, or under-development of the condyle may be congenital or acquired. Congenital hypoplasia might affect one or both condyles and is present at birth. Acquired hypoplasia is the result of an incident that affects the normal development of the condyle. Events that can negatively affect the normal development of the condyle include: external trauma, radiation for the treatment of skin lesions, infection, circulatory and endocrine disorders. Bilateral condylar hypoplasia is considerably less common than unilateral involvement. However, both unilateral and bilateral condylar hypoplasia can lead to a significant clinical facial deformity. The extent of the deformity with acquired condylar hypoplasia is dependent upon the severity of the injury that caused the disruption in condylar growth, the duration of that injury and the age that it occurred. As seen in this case, unilateral condylar hypoplasia can produce a severe facial deformity that can lead to difficulties in orthodontic treatment, especially in the young and growing patient.¹

Unilateral hypoplasia leads to limitation of normal movement and exaggeration of the antegonial notch on the affected side. Though growth at the affected condyle(s) might be arrested, growth does continue to occur at the posterior border, near the angle of the mandible. This continued growth, at the posterior border, leads to widening or thickening of the ramus(es).
Condylar Aplasia or Mandibular Condyle

Condylar aplasia, or failure of the mandibular condyle to develop is generally a rare condition. Condylar aplasia is often associated with other anatomical defects including defective or absent external ear and macrostomia. Obviously, unilateral aplasia results in severe facial asymmetry, more notable as the facial features develop with age. Mandibular shift to the affected side occurs with maximum incisal opening. This shift is not noted with bilateral condylar aplasia. Osteoplasty at the age of maturity is the treatment of choice. If the patient exhibits little difficulty in mastication, surgical correction may be optional.1

As all orthodontists should be aware, genetic predisposition plays an essential role in the development of malocclusions. Patients with vertically growing mandibles result in longer face heights, retrognathic mandibles and steep mandibular planes.2,3,4 However, long-term environmental conditions, such as upper airway obstruction, might be erroneously passed off as a genetic tendency or simply as part of “the pattern.”5 Many maxillary and mandibular growth problems develop from the chronic impact of environmental influences, particularly upper airway obstruction (UAO).5,6,7,8

Influences of Upper Airway Obstruction on Jaw Growth: 10, 11, 12

- Larger Total and Lower Anterior Face Heights
- Maxillary Buccal Segment Extrusion and Lowering of the Maxilla
- Narrow Maxillary Arches
- More Retrognathic Mandibles
- Steeper Mandibular Planes

Clearly, the younger the patient at the time of disruption of normal condylar growth, the greater the facial deformity. Based upon the carpal index for this patient, she has at least four more years of growth left, thus, increasing her already significant facial asymmetry.1

Lateral cephalometric analysis, using the 3D scan, revealed significant mandibular retrognathia and a high mandibular plane angle contribution of the severe right condylar hypoplasia. Evaluation of the lateral cephalogram demonstrates a significant difference in the right and left mandibular planes. Moreover, this patient, who had a previous thumb habit and is a mouth breather, has an upper airway obstruction from an enlarged adenoid pad (Figs. 7a & 7b).

So, as you can see, I have my hands full with this particular case of condylar hypoplasia, a significantly retrognathic mandible with a steep mandibular plane, airway obstruction and missing teeth. Currently, the treatment plan for this patient includes a bonded RME, referral (along with the scan) to an otolaryngologist for T&A, upper and lower appliances, possible replacement of missing maxillary first bicuspids (if space closure becomes difficult) and orthognathic surgery of both jaws to correct her significant facial asymmetry.

This case is an excellent example where a CBCT scan and an appropriate 3D cephalometric analysis will significantly influence the orthodontic treatment plan. And, although my treatment plan will not eliminate all of the negative social issues of adolescent life, it will alleviate a noticeable physical condition and help her to face life more symmetrically, in more ways than one.

*Name has been changed to protect patient privacy

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 diplomat of the American Board of Orthodontics and an affiliate member of the SW Angle Society. Dr. Edgren has presented to numerous groups on the value of CBCT and cephalometrics. His articles have been published in both the AJODO and American Journal of Dentistry. Dr. Edgren currently has a private practice in Greeley, Colorado.

Ad Index

Our advertisers make it possible for us to bring Orthotown to you free of charge. Almost all of the advertisers provide telephone numbers in their advertisements for your convenience and fast response. Our advertisers want to hear from you.