



THE CORNERSTONE TO A Healthy & Beautiful

FACE

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The inescapable result of inadequate dento-facial growth is dental crowding. Just ask yourself how many of your patients have lower incisor crowding? It is so common we tend to accept this as normal, and yet the question remains is this the full intended genetic expression for facial and jaw growth? There is a commonly held belief that through evolution modern man has developed smaller jaws, which would imply that there is not enough room for a full complement of teeth, and hence crowding is the norm.

And yet, in 2013 the Neanderthal genome project revealed after complete gene sequencing of a 50,000 year old Neanderthal femur found in a Siberian cave that we share 99.7% of base pairs with our primitive ancestors. Since we can assume that we share the same genetic blueprint for complete jaw and facial growth as our ancestors, it must be environmental influences that are the culprit for damaged facial and jaw growth expression. There is an evolving paradigm that helps to explain genetic expression entitled Epigenetics. This emerging theory has implications in orthodontics whereby we now understand that with gentle and slow stimulation of resident stem cells within the jaws, it is fully possible to

recapture a large portion of the morphogenetic patterning of the original genetic blueprint. In plain English, this means that we can reboot the system to create the proper shape to our jaws. The concept that expansion of the maxilla is only thru mid-palatal suture appositional growth prior to sutural fusion at or shortly after puberty is now outdated. It seems that the orthodontic profession is rather rigidly adherent to the notion that it is not possible to expand the adult maxilla beyond a few millimeters all within the dentoalveolar housing. However, epigenetic mechanisms are the only current plausible explanation for bony growth of the entire maxilla and mid face from proper stimulation via appliance therapy¹. It is routine and predictable to get stable and robust induced morphogenesis of the maxilla including completely new buccal alveolar bone, palatal vault changes, mid face changes, and changes to the nasal cavity.

In LVI's Physiologic Orthodontics course, we teach that careful diagnostic attention must be applied to the maxilla as it is the key to proper orthopedic diagnosis. It is the template to which the mandible must accommodate. It is the key to proper oral tongue posture, and if properly developed will facilitate competent nasal breathing and nasal air flow. It is the



Figure 1



Figure 1a



Figure 2

“In LVI’s Physiologic Orthodontics course, we teach that careful diagnostic attention must be applied to the maxilla as it is the key to proper orthopedic diagnosis.”

centerpiece to the midface, and largely determines the beauty of the face. Perhaps 80% of the adult TMD pain patients I treat have had prior orthodontic treatment. Almost all of them present with an orthopedically deficient maxilla when analyzed from transverse and sagittal perspectives, and in relation to the cranial base. It is my sincere clinical opinion that in children, adolescents and adults current orthodontic treatment protocols largely leave the maxilla deficient, by a misunderstanding of the possible application of epigenetic induced morphogenesis².

It is still accepted orthodontic treatment to extract permanent bicuspid to create space to align teeth. This protocol, in my clinical opinion, rarely results in a physiologically stable stomatognathic system. Although, straight teeth can be achieved via extraction based treatments, there is exceptionally significant risk of TM joint compression, muscle pathology, and altered cranial posture over cervical spine. In addition to the above, a deficient maxillary arch form increases risk of displacement of the tongue distally which can manifest as clinically relevant sleep breathing disorders at any time in life.

This case was seen by three orthodontists all of whom insisted that extractions of permanent bicuspid would be necessary to create space for alignment of the severely crowded dentition (**figure 1,1a&2**). Even though it is acknowledged by some that it is possible to expand the pre-pubertal maxilla, if there is moderate to severe crowding, the recommendation is often extraction over expansion. I encouraged the mother that extraction was not necessary. This 11 year old girl started treatment with a fixed three way expander that also incorporated an anterior bite plate, and hooks for reverse pull headgear. This allowed simultaneous development both sagittal and transverse directions, and also en masse forward development of the maxilla in conjunction with skeletal vertical development by means of the bite plate (**figure 3&4**). The dramatic changes occurred in just under seven months of time. As she accommodated to the wear



Figure 3




Figure 4



Figure 5



Figure 6

of the upper appliance, we inserted a similar lower three way expander to accomplish transverse development of the mandible in conjunction with distalization of the molars. Again this follows the paradigm that it is also possible to stimulate morphogenesis of the mandible vertically via the rami, transverse and sagittally. There is even stronger resistance to the concept that you can expand/grow the mandible, but my clinical experience following epigenetic thinking has revealed this is not true. My experience is that we can indeed achieve mandibular arch expansion in spite of the concepts that appear to guide traditional orthodontists.

Of note is that by following an epigenetic inspired, Physiologic/Neuromuscular path of treatment, there are rapid (3mos.) and healthy changes in the cranial posture over cervical spine (figure 5&6). The forward head posture is nearly resolved, and the cranium has moved from an anterior rotation to a more neutral orthogonal position. Finally, because of epigenetic remodeling of the entire maxilla note the difference in the nares of almost 4mm of width gained, which also is accompanied by increase in the inferior turbinate space (figure 7&8). As I have seen many times, this young patient reports better nasal breathing, and this will facilitate proper rest tongue posture in the palate, and competent lip posture. This is physiologic and will act as nature's perfect retainer to minimize relapse after active treatment.

In order to achieve the genetic full face forward potential of our patients, including a broad full upper arch that is intrinsically attractive, it is almost always appropriate to incorporate maxillary arch development/ expansion for both children and adult orthodontic patients.

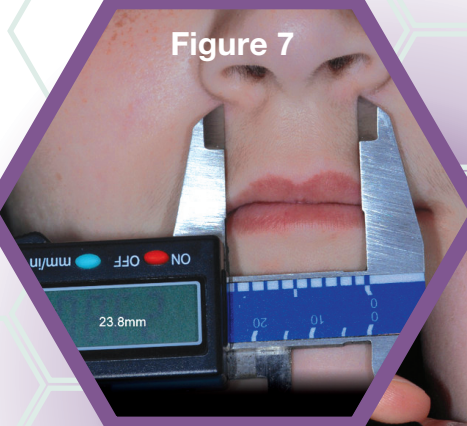


Figure 7

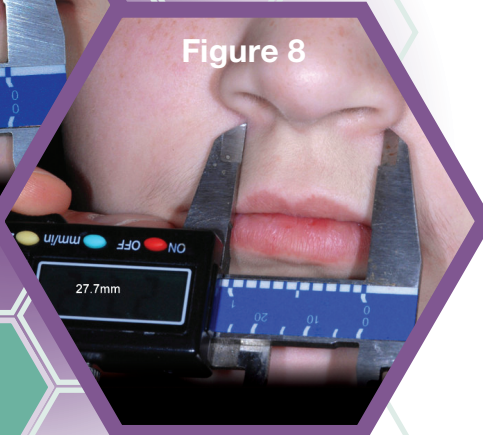


Figure 8



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1. Williams, M.O.Murphy, N.C. Beyond the ligament: A whole-bone periodontal view of dentofacial orthopedics and falsification of universal alveolar immutability. Semin Orthod. 2008;14:246-259

2. EPIGENETIC ORTHODONTICS IN ADULTS By Dr. Dave Singh DDS PhD BDS & Dr. James Krumholz