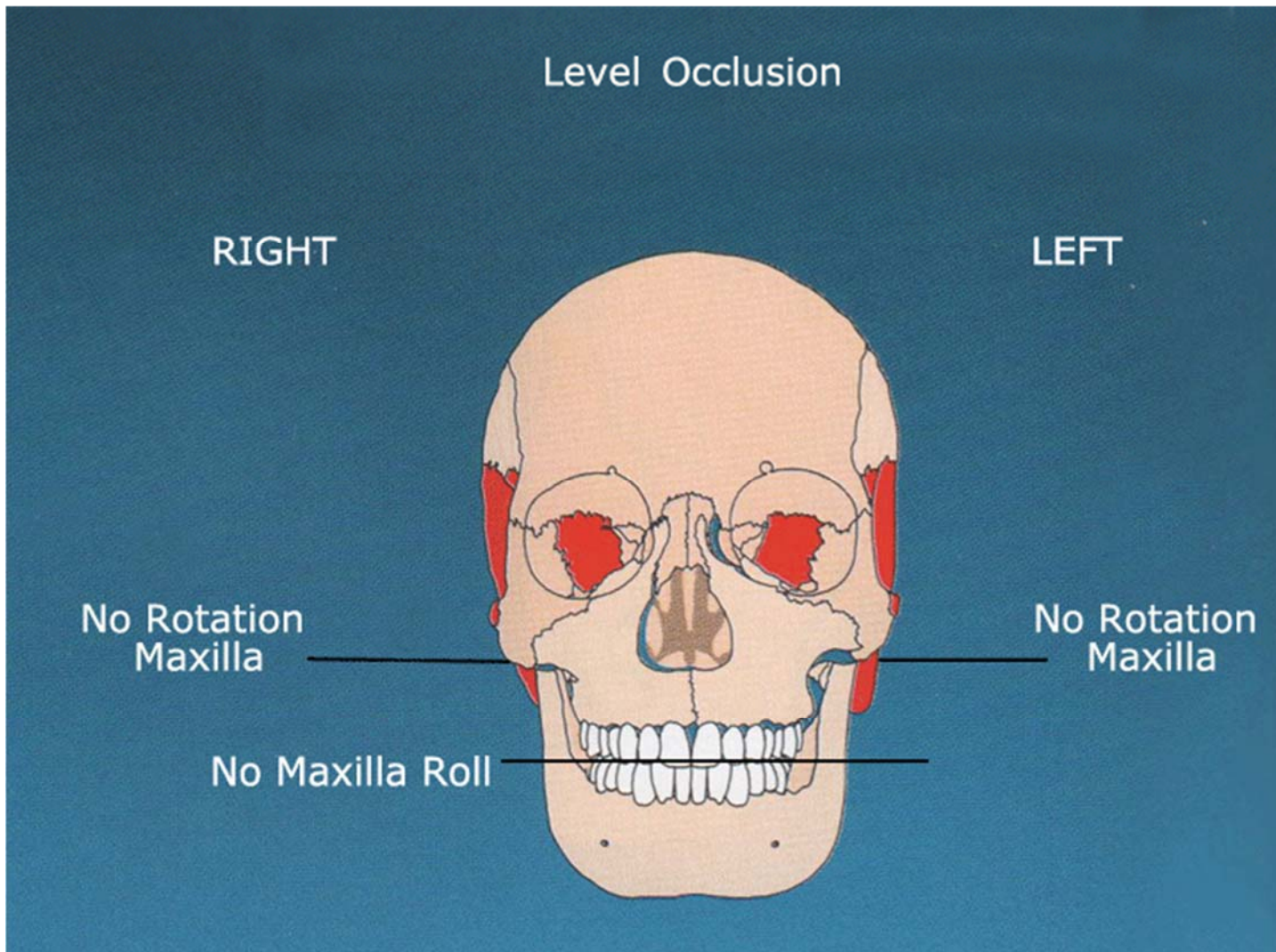


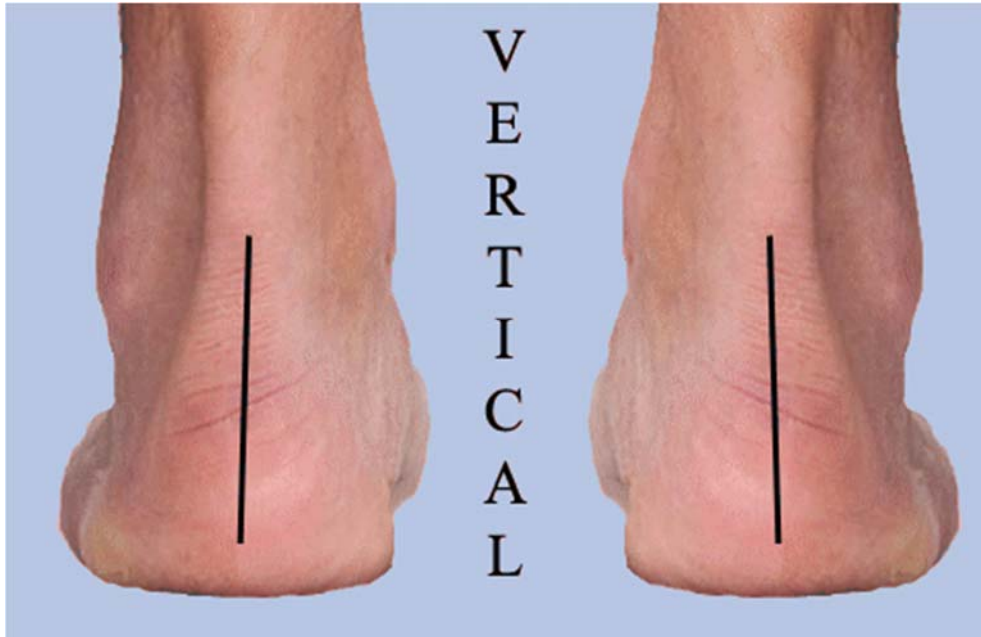
Cross Bite Resulting from Abnormal Foot Pronation

Frontal Plane Distortion of the Maxilla (Cross Bite) Resulting from Abnormal Pronation (Pure Ascending Postural Distortional Pattern)



Cross Bite Resulting from an Abnormal Pronation Pattern Left > Right

Above cranial diagrams courtesy of Dr Jonathan Howat which appear in Chiropractic Anatomy and Physiology of Sacro Occipital Technique, Section Three, Cranial Dental Sacral Complex, pages 148 and 149.



Abnormal Foot Pronation Animation

1) If the abnormal foot pronation is left > right, both innominates rotate forward, left > right. Clinically the left innominate will appear more anteriorly rotated, relative to the right innominate. The left leg will function shorter.

Rothbart BA, Esterbrook L, 1988. [Excessive Pronation: A Major Biomechanical Determinant in the Development of Chondromalacia and Pelvic Lists](#). *Journal Manipulative Physiologic Therapeutics* 11(5): 373-379.

Rothbart BA, Liley P, Hansen, et al 1995. [Resolving Chronic Low Back Pain. The Foot Connection](#). *The Pain Practitioner*(formerly *American Journal of Pain Management*) 5(3): 84-89

Rothbart BA, 2002. [Medial Column Foot Systems: An Innovative Tool for Improving Posture](#). *Journal of Bodywork and Movement Therapies* (6)1: 37-46

Rothbart BA 2006. [Relationship of Functional Leg-Length Discrepancy to Abnormal Pronation](#). Journal American Podiatric Medical Association; 96(6): 499-507

2) The left temporal bone will be more posteriorly (externally) rotated compared to the right temporal bone.

Rothbart BA 2008. [Vertical Facial Dimensions Linked to Abnormal Foot Motion](#). Journal American Podiatric Medical Association, 98(3):01-08, May.

3) The sphenoid bone is forced into flexion. Greater force is placed on the left lesser wing of the sphenoid bone due to the relative greater posterior rotation of the left temporal bone. This results in a left sphenoid torsion.

4) Sphenoid flexion forces the both maxillas into external rotation, left > right due to the left sphenoid torsion. Clinically the left maxilla bone will appear to be more externally rotated compared to the right maxilla bone.

5) Due to the asymmetrical external rotational force resulting from the left sphenoid torsion, the maxilla will roll right (cross bite).

Rothbart BA 2013. [Prescriptive Insoles and Dental Orthotics Change the Frontal Plane Position of the Atlas \(C1\), Mastoid, Malar, Temporal and Sphenoid Bones: A Preliminary Study](#). Journal of *Cranio Mandibula*

6) Summation: In a pure ascending postural distortional pattern, an abnormal foot pronation pattern of left > right can result in a right roll of the maxilla (cross bite).

Rothbart BA 2008. [Malocclusions Linked to Abnormal](#)