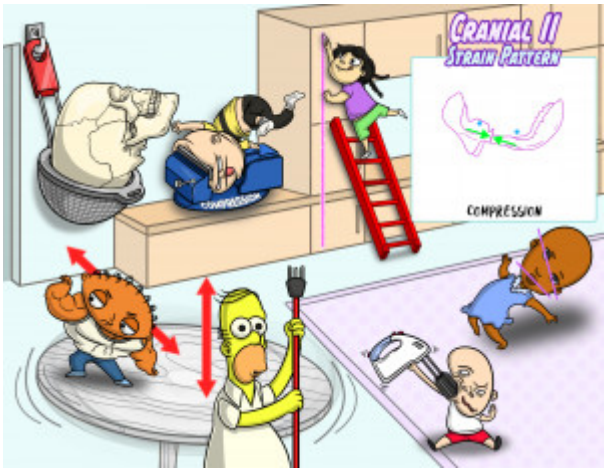
Cranial II: Strain Patterns

In Osteopathic Cranial Manipulative Medicine, strain patterns are somatic dysfunctions of the sphenobasilar synchondrosis (SBS), occurring when normal physiologic motions of flexion and extension are altered. Strains are named by the motion of the sphenoid and characterized as physiologic or pathologic. Physiologic strains maintain rotational motion of sphenoid and occiput in opposite directions, like two gears interlocked. These dysfunctions include exaggerated physiologic motions of flexion and extension, as well as torsion and sidebending-rotation. Pathologic strains (except for compression) involve rotation in the same direction, causing “grinding of the gears" in the SBS. This is seen in vertical and lateral strain. In compression, the sphenoid and occiput are jammed together, severely limiting SBS motion. Pathologic strains are considered more severe and may cause worse symptoms than physiologic strains.



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Physiologic Motion

Flexion

Flexing with Flexion

Flexion is a physiologic motion of midline (unpaired) cranial bones that occurs during the inhalation phase of the Primary Respiratory Mechanism (recall that inhalation and exhalation of the cranium is not the same as inhalation and exhalation of the lungs). During flexion, the angle of the SBS decreases, the SBS moves superiorly, and both the greater wings of the sphenoid and the lateral angles of the occiput move inferiorly. During the vault hold, the physician’s hands feel a widening motion towards the feet of the patient. Flexion is a physiologic motion, but can also be a strain. An SBS that is flexed is unable to move into extension.

Extension

Extending with Extension-cord

Extension is a physiologic motion of midline (unpaired) cranial bones that occurs during the exhalation phase of the Primary Respiratory Mechanism. During extension, the angle of the SBS increases, the SBS moves inferiorly, and both the greater wings of the sphenoid and the lateral angles of the occiput move superiorly. During the vault hold, the physician’s hands feel a narrowing motion towards the vertex of the patient’s head. Extension is a physiologic motion, but can also be a strain. An SBS that is extended is unable to move into flexion.

Physiologic Strains

Torsion

Twisted

Torsion is a physiologic strain, meaning the sphenoid and occiput are rotating in opposite directions. In a torsion, both sphenoid and occiput rotate around an anterior-posterior axis that runs through the SBS. Because of this motion, one side of the sphenoid will be superior while the other is inferior. Likewise, the one side of the occiput will be superior and the other inferior. The torsion is named by the greater wing of the sphenoid that is more superior. During a vault hold, the physician’s hands twist in opposite directions.

Sidebending/Rotation

Sidebending/Rotating

Sidebending/Rotation is a strain consisting of two coupled, simultaneous movements. The first is sidebending, in which the sphenoid and occiput rotate in opposite directions around two vertical axes. This causes the SBS to “open up” to either the right or left. The second movement is rotation, which occurs around an anterior-posterior axis. During rotation, the sphenoid and occiput rotate in the same direction (an exception to the rule that physiologic strains rotate opposite) so the greater wing and lateral angle on the side of the wide SBS drop inferiorly. The side that opens up and the side that drops inferiorly are always the same, and are always the name of the strain (e.g. left sidebending/rotation). During a vault hold, one of the physician’s hands will widen and move inferiorly, while the other will narrow and move superiorly.

Pathologic Strains

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Vertical

Vertical

A vertical strain is a pathologic strain pattern, meaning the sphenoid and occiput rotate in the same direction, resulting in shearing or “grinding of gears” at the SBS. The sphenoid and occiput rotate around two transverse axes, as in flexion and extension. The strain is named for what direction the base of the sphenoid points, either superior or inferior. On vault hold, the physician’s hands will twist together, in the same direction, in the sagittal plane. For a superior vertical strain, both 2nd digits will move inferiorly, while both 5th digits will move superiorly. For an inferior vertical strain, the 2nd digits move superiorly, while the 5th digits fall inferiorly.

Lateral

Ladder

A lateral strain is also a pathologic strain pattern, meaning the sphenoid and occiput rotate in the same direction, resulting in shearing or “grinding of gears” at the SBS. The sphenoid and occiput rotate around two vertical axes, as in sidebending. The strain is named for the direction of the base of the sphenoid, either left or right. On vault hold, the physician feels the 2nd digits shifting left or right, and the 5th digits shifting in the opposite direction, resulting in a “parallelogram head”. This creates the feeling that one hand is pronating while the other is supinating.

Compression

Compression by Vice

SBS compression is a pathologic strain pattern that often results from trauma to the front or back of the head. The motion of the sphenoid and occiput is not rotation, as in other strains, but translation along an anterior-posterior vector. The sphenoid and occiput jam together at the SBS, causing severely limited motion. Palpation during vault hold reveals Cranial Rhythmic Impulse that is reduced in amplitude and/or frequency. The physician’s hands may sense a very slight motion of the greater wings of the sphenoid moving toward the lateral angles of the occiput, causing slight finger adduction.

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