An osteopathic approach to feeding dysfunction in infants

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Goals

- Oropharyngeal dysfunction defined
- Suckling described
- Forces of labor and their effect on the tissues
- The anatomy that influences oropharyngeal function
- Evaluation
- Treatment approach
Oropharyngeal dysfunction simply describes difficulty controlling oropharyngeal functions, specifically feeding motions and, later if life, speech disorders. Clearly, when an infant presents with feeding dysfunctions, there is quite a broad differential diagnosis to consider, and a good history and physical will help to differentiate between things such as obstructions, congenital disorders, such as achalasia or abnormal communications between the upper GI and the airway, CNS disorders and primary muscular disorders. In addition to these concerns which require more immediate attention, biomechanical influences, such as somatic dysfunction, can be evaluated and treated.
Suckling can be divided into two basic categories: nutritive and non-nutritive. Non nutritive suckling is a reflex seen as early as 18 weeks gestation. It is viewed as the precursor to nutritive suckling and serves a different function than nutritive suckling. Its patterns are more dis-coordinated and do not generate the negative pressures required to express milk from the breast. Non-nutritive suckling is usually seen alone in infants born under 32 weeks gestation, as such, they cannot perf the necessary actions with their mouths to feed effectively from breast or bottle, often requiring tube feeding. However, this type of suckling does have its purpose. NNS does appear to stimulate weight gain in hospitalized infants leading to earlier discharge dates. It also does appear to stimulate the maturation of nutritive suckling in those infants born between 32-36 weeks.
• Nutritive suckling patterns
  ◦ More coordinated, able to generate the negative pressures needed to express breast milk
  ◦ Infants born 32-36 weeks gestation will often show immature nutritive suckling patterns, but will progress to mature suckling within 1-2 weeks
There is a very particular pattern to nutritive suckling. The lips must be able to seal against the nipple, requiring the muscles that close the mouth (temporalis, massater and medial pterygoid) and their innervation (CN V) as well as the muscles that close the lips (orbicularis oris and buccinator) and their innervation (CV VII) to be intact and working well. Then the tongue must be able to protrude and elevate enough to bring the nipple to the hard palate. This still does not extrude the milk. The tongue must then be able to rapidly move inferiorly and posteriorly to create an area of negative pressure that will then express the milk. In order for the tongue to be able to do all this work, the root of the tongue must be stable.
How does birth affect anatomy?

Wise womb wishes
The newborn experiences tremendous forces during the transition from intrauterine to extrauterine life. As much as 80-100 mmHg of pressure is exerted into the fetal head, or whatever parts may be presenting.

We have 6 cardinal movements of the birthing process: engagement, descent, flexion, internal rotation, extension, external rotation, expulsion (birth). From the child’s perspective, each of these is associated with motion of the head and neck. The head should enter the engagement stage with the sagittal suture lying along the transverse axis of the mother’s pelvis, ideally so that the occiput is facing the left pelvis. This allows the parietal bones to enter the perineum at the same time. This is termed synclitism. If the head is in any other position, that is termed asynclitism. During the next stage, descent, the head must flex. This action locks out the OA, the only true joint in the head at this point. Then the

This creates a situation where the forces of labor can then be transmitted
The sagittal suture lies along the transverse diameter of the pelvis = synclitism. Ideally the parietal bosses enter the pelvic inlet together. Labour progresses as the increasing strength of uterine contractions pushes the presenting part of the fetus into the uterine fundus causing effacement and dilation of the cervix and stretching the soft tissues of the pelvis.
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Where to look for problems

- In the oropharyngeal space
  - Intrinsic and extrinsic muscles of the tongue
- Stabilizing structures for the tongue
  - Above
    - Muscles attaching to cranial base and mandible
  - Below
    - Muscles attaching to hyoid, sternum and clavicle
Intrinsic and Extrinsic Muscle Involvement

- Intrinsic: change the shape of the tongue
  - Speech
  - Manipulation of food bolus
- Extrinsic: stabilize tongue for nutritive sucking
Intrinsic muscles
Deepest supporting structures

- Genohyoid
- Genoglossus
Extrinsic muscles
Deep supporting structures

- Extrinsic muscles are stabilized by their hyoid, mandible or temporal bone attachments.
- Suspended from the cranial base

Pharyngeal constrictors
Styloglossus
Myoglossus
Hypoglossus

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Extrinsic muscles
Superficial supporting structures

- Omohyoid
- Stylohyoid
- Digastric
- Styloglossus
- Mylohyoid
- Sternoglossus
- Sternohyoid
Hyoid is suspended by the stylohyiod ligaments, stylohyoideus and digastric and mylohyoid muscles.
Stabilized from below by sternohyoid and thyrohyoid.
Evaluation
Evaluation

- Suckling coordination
  - Smallest finger in mouth to evaluate motion of tongue—symmetry, strength, tone
  - Mandible motion during suck
  - Hyoid
- Cranial base
- Transitional areas
  - OA, CTJ, TLJ, LSJ
- Sacrum
## Treatment options

### Areas to address
- Address the root-extrinsic muscles and supporting structures
  - Cranial
    - Base mechanics (temporal)
    - Mandible
  - Deep supporting structures suspended from base
  - Hyoid
  - Clavicle
  - Intrinsic tongue
  - Cervical spine
  - Thoracic inlet
  - Upper extremity
  - Sacrum

### Modalities to consider
- Cranial osteopathy (balanced membranous tension)
- Myofascial release
- Balanced ligamentous treatment
References

- Carreiro, JE. *An Osteopathic Approach to Children*
- Sergueef, N. *Cranial Osteopathy for Infants, Children and Adolescents*
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