Relationship Between Posture & Atypical Swallowing: Clinical Relevance

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Disclaimers

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Learning Outcomes

Attendees will be able to

1. Identify the most common postural disorders and their effects on oral functions

2. Examine the relationships between posture and swallowing disorders

3. Plan for a multidisciplinary approach to swallowing and postural disorders
Our Story

- My background in myofunctional therapy in Italy and the USA
- Masters in Posturology in Naples and Rome doing joint research with the Master in Deglutition in Turin
- Multidisciplinary and global connections
Myofunctional Therapy & Posture

- Myofunctional therapy is an interdisciplinary neurological re-education that promotes healthy growth and development of the orofacial complex, along with prevention of orofacial myofunctional disorders.

- We look at the whole patient, including posture, although we focus our intervention on promoting or restoring proper orofacial functions, with EBP.
Freeze! Don’t move!

Freeze!
Why is Posture Relevant to SLPs?

In treatment of dysphagia we often take advantage of postural adjustments:

- Head tilt
- Chin tuck
- Head rotation
- Sitting vs. reclining
In treatment of **orofacial myofunctional** disorders therapists often take advantage of postural adjustments:

- Head position
- Mandibular rest and dynamic position
- Tongue and lips at rest position
- Neurological re-education
Relevance

- In treatment of voice disorders we often take advantage of postural adjustments:
  - Head position
  - Neck relaxed
  - Shoulders relaxed
  - Core muscles relaxed
Relevance

In treatment of **speech** and **language** disorders we often take advantage of postural adjustments:

- Head position with eyes parallel to horizon
- Face toward speaker during exchange of communication
- Shoulders in line during reading and writing
In treatment of communication disorders we often take advantage of postural adjustments:

- Body posture in non-verbal communication
- Proximity and orientation
- Arms and legs position
- Greetings and signals
- Social significance of body language
Relevance

- In assessment and treatment of **balance** disorders audiologists often take advantage of postural adjustments:
  - Benign Paroxysmal Positional Vertigo (BPPV)
  - Romberg test for balance
  - VNG (videonystagmography)
  - Relieving Symptoms of Vertigo (Epley Maneuver)
Relevance

- In treatment of **feeding** and **ADL** disorders OTs often take advantage of postural adjustments:
  - Upper body position for feeding
  - Head position and support for feeding and communication
  - Compensatory positions and optimization for ADL
Relevance

- In **sports** and in treatment of **musculoskeletal** disorders PTs take advantage of postural adjustments:
  - Optimization of performance
  - Prevention of injuries
  - Rehabilitation post surgery or trauma
  - Reconditioning after bed rest
  - Prevention of muscle atrophy
Applications

- What can you bring home today?
- Assessments of posture as relevant to SLP or OMT.
- Incorporating an interdisciplinary approach to managing patients with posture problems.
- Increased awareness of the context in which oral functions occur
Habits

- Intensity
- Duration
- Frequency
Chain of Events

- Habit and/or chronic necessity
- Physiological changes (adaptation)
- Pain
- Anatomical changes (deformation)
- Pain
Forward Head Posture

Let’s start with the most common postural disorder: Forward Head Posture (FHP)

FHP is a symptom that creates other symptoms
Why the Symptoms?

- The cascading effects of FHP and other postural problems

C I C

Figure 1

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How did I get FHP?

- Too much back support since infancy (strollers and cradles)
- Poor role models (fashionable slouch and sexy open mouth)
- Poor work ergonomics (desk, chair, computers...)
- Poor leisure habits (couches, texting, recliners...)
Breathing

* Allergies or obstructions ---> oral breathing ---> tongue low and forward ---> jaw low and forward ---> head tilts up ---> need for eyes to be horizontal ---> neck muscles tense ---> cervical spine changes shape ---> shoulder blade compensate ---> chain of muscles transmit changes in tension all the way down to one’s feet.
FHP & the Mouth


- 24 adults, of both genders, aged from 18 to 30 years old with report of clinical manifestations of mouth breathing during the childhood. 20 subject in the control group, no respiratory problems past or present.

- The SG showed more forward head posture by the angular and the cervical distance. Additionally, this group presented a larger angular measure of the lumbar lordosis compared to the CG.

- Adults with mouth-breathing childhood have postural alterations, mainly in the head and lumbar column, which keeps for the whole life.
Breathing & Posture


The most prevalent finding in this group of 346 subjects was the presence of orofacial myofunctional disorders. The most frequently orofacial myofunctional disorder identified in these subjects, who also presented mouth breathing, included: *habitual open lips rest posture, low and forward tongue rest posture and lack of adequate muscle tone.*
Breathing & Posture


Children with nasal respiration, age 8 and above, present with better posture than those who continue oral breathing beyond age 8.
Recap so far...

- What are the three variables that create a postural habit?
- What are the most common postural problems?
- What are some contributing factors to low tongue posture?
- Can you name three direct or indirect consequences of FHP?
Postural Tone System

How do we keep standing up and sitting up without falling? How do we keep our head up straight?

- Equilibrium, balance, homeostasis

- Slight but constant and ever changing tensions and counter-tension of muscles (equilibrium) to be able to properly interact with the environment (balance) with the highest efficiency and the least waste of energy (homeostasis)
Postural Input

- Head, jaw, tongue, lips
- Eyes
- Vestibular portion of the inner ear
- Specialized sensory cells (spindles...) in muscles
- Sensors in articulations an joints
- Skin, fascia and internal organs stretch
- Feet
Postural Output

- Neurological
- Muscle chains & fascia
- Gravity
- Static or dynamic
- Psycho-emotional
- Adaptive or protective
- Volitional
FHP & the Mouth


The influence of forward head posture on the craniofacial growth can determine a morphoskeletal and neuromuscular pattern leading to a dysfunctional condition. A correlation is established between Class II Occlusion, forward head posture, and craniomandibular dysfunction.

352 children radiologically identified with asymmetry in the occipito-cervical region. About 70% of the children revealed orofacial myofunctional disorders.

A weak body posture correlated statistically significantly with all assessed myofunctional variables. All orthopedic items correlated significantly with a *reclined head position*.

A blockade of the iliac spine correlated significantly with persistent *habits, articulation disorders and tongue dysfunction*. Functional asymmetry of the upper cervical spine correlated significantly with *incompetent lips*.

Importance of *early interdisciplinary screening* in children to ensure a physiological development of the orofacial region and the still growing vertebral column.
Posture & Tongue


Changes in placement of the tongue on the palate, stimulating the palatine receptors, significantly changed the posture of the subjects, as identified by the feet position on a stabilometric base.
Posture & Mandible


Tongue, Mandible & Hyoid Bone

Figure 6-9. Extrinsic muscles of the tongue. (From Hanson, M.L., and Barret, R.E.; Fundamentals of Orofacial Myology, 1988. Courtesy of Charles C Thomas, Publisher, Springfield, Illinois.)
Muscles and Posture

From Frank Netter
The Tongue & Posture

- It is the “rudder” of the upper body, and provides a postural “reset” with each swallow, by compressing the sensory receptors of the palate, which are innervated by the nasopalatine branch of the trigeminal nerve, along with the neuro-occlusal reset.

- We swallow about 600-1000 times a day, but tongue and jaw rest position is more important.
Swallowing and Cranial Motion


- This important oro-cranial function (along with the occlusal system) is maintained constant by recruitment of other muscle groups such as neck, shoulders, back etc.
“Normal Swallowing”

During swallowing, the contraction of the styloglossus facilitates the cranial movement which is involved with a proper cranio-sacral function.

The tongue pushing up exerts a pressure on the palate that is then transmitted through the maxillary bones, the palatine bones and the vomer to the sphenoid bone, which articulates with all the other cranial bones.
“Atypical Swallowing”

- When nasal breathing is difficult or absent the mouth becomes the substitute breathing inlet.

- When oral breathing is required for a prolonged period of time, the tongue moves forward to create more space in the airways (obligatory tongue thrust).

- The tongue is attached to the jaw which also moves forward.

- The muscle chain is altered in an attempt to compensate for the tongue position.

Courtesy Dr. Mario Bondi
The Glosso-Postural Syndrome

- Scoppa F. 2000. Un approccio globale allo studio della postura. *Il Fisioterapista*; 4:61-6 [Italian];


The Glosso-Postural Syndrome

- Type I: Forward head posture, mental symphysis protruded, tongue thrust, anterior open bite, anterior pull of C2, centric plumb line too forward, rounded shoulders, scapular plane in front of gluteal plane, abdominal muscles hypotonia, pronated feet, back pain

- Type II: less frequent than Type I, tongue thrust against mandible, retroposition of the head, eccentric (anterior) position of the thorax, “chicken-like” movements of the head during swallowing

Courtesy of F Scoppa
Postural Evaluation by SLP

- Observation & self report
  - Walking
  - Standing
  - Sitting
  - Working
  - Relaxing
  - Sleeping
Postural Evaluation by SLP

- Observation & self report
- Head posture during standing, sitting, in frontal and sagittal position
- Shoulders posture during standing and sitting
- Neck pain, TMJ pain, back pain: intensity (scale 1-10), frequency and duration
- A history of significant or lingering injuries
Postural Evaluation by SLP

- Observation & self report
- Nasal breathing (assessed through nasal mirror fogging, sniff test, Cottle test, Rosenthal test etc)
- Mandibular position (freeway space)
- Lips at rest (closed or open)
- Tongue position at rest
Chewing and Swallowing

- Observation & self report
- Chewing (mouth open or closed, on one side only)
- Masseters and temporalis muscle tension
- Lips open or closed during swallowing
- Facial grimaces during swallowing
- Head movements
- Shoulder movements
Case Study #1

- 5-12 Patient JB, 30 yo, referred by orthodontist after unfavorable results of orthognathic surgery in 2011 and orthodontic treatment, in progress to this date

- JB worked 8-9 hours at a desk, did not practice any sport and in the evening he liked to “relax” at home

- Presented significant forward head posture, significantly asymmetrical shoulders, TMJ instability and discomfort, on soft mechanic diet because he cannot chew hard foods, chewed predominantly on one side, with inconsistent nasal breathing
Case Study #1
Case Study #1

JB was treated for jaw ROM and stability to improve chewing, for proper tongue position at rest, for awareness of his head position.

JB was also referred to a PT specifically to address FHP, workplace ergonomics & increase physical activity to support proper posture.

Because FHP is a habit and takes time to be corrected, JB was discharged on 9-12 when chewing and rest position were achieved and continues to work on posture and awareness. Orthodontic results are now stable.
Case Study #2

- 6-13 Patient ID, 59 yo, referred by massage therapist for persistent facial and neck pain following dental procedures.

- Consultation with treating gnathologist and dentist revealed a complex TMJD aggravated by repeated and extensive dental procedures. Patient was unable to chew, had a hard time swallowing, perceived a ‘globus” in her throat, had neck muscle tension, facial pain, voice weakening, FHP, asymmetric shoulders and other symptoms.

- Since evaluation in June, ID has been suffering from increasing facial and neck pain, shoulder dislocation, knee injury, hip pain, and “central generalized sensitization”.

Case Study #2
Case Study #2

6-13 Given the complexity of the case, a team approach was needed: while a full mouth dental reconstruction was in course, a TMJ specialist was consulted for guidance with temporary muscle exercise therapy aimed at reduction of pain, improvement of muscle oral functions and elimination of the “globus” sensation, while other therapists were working on her posture, tight neck and shoulder muscles.

ID is still on a monthly follow up to monitor her progress with the dentists. SLP and OM therapy will be completed with supervision of the gnathologist, once the full mouth reconstruction is completed.
Case Study #3

- 1-12 Patient ES, 61 yo, referred by her dentist for facial pain, reduced ROM affecting biting and chewing (full mouth opening 27 mm, normal 45-50)

- ES was involved in a car accident with whiplash injury a few years back; presented a significant FHP with asymmetric shoulders with reported tightness of the neck muscles and difficulty in properly moving her neck; she also presented TMJ discomfort and “central generalized sensitization”.

Case Study #3

- After clearance from her dentist for TMJ disorders, ES started a program of postural awareness with tongue repositioning at rest, increased ROM and SOM of the mandible to improve jaw stability at rest, during chewing and during swallowing.

- Concomitant orthodontic treatment with ALF appliance was implemented to improve occlusion.

- On 4-12 ES was completely asymptomatic, with normal mandibular ROM and SOM, normalization of chewing and swallowing. A maintenance program of mandibular ROM exercises, neck tension reduction and posture awareness was followed for about 6 months.
Case Study #4

7-12 Ul, 7 yo, co-evaluated by an MD, a PT and a SLP for presence of glosso-postural syndrome: atypical swallowing, signs of predominant oral breathing, face down and double chin, FHP, head rotated RT and flexed toward shoulder, asymmetric face and asymmetric eyes, prominent shoulder blades, lumbar hyperlordosis, hyperextension of the legs, prominent abdomen, inability to balance on one foot and more.
Case Study #4

Courtesy Emilio DiGiacomo
Case Study #4

- UI underwent orofacial myofunctional therapy to correct functions, breathing therapy to restore nasal breathing, physical therapy to strengthen his core muscles and correct overall posture.

- On 9-12 UI was re-evaluated and the short term results were encouraging: his tongue position was more consistently correct, he was able to breath nasally, he was able to balance himself on one foot, and was performing abdominal muscles exercises consistently, resulting in an improvement of the hyperlordosis.
Multidisciplinary Approach

- Posture is about adaptation to a greater problem requiring additional training and a team approach:
  - Allergist
  - PT
  - SLP
  - Orthodontist
  - Cranio-Osteopathic Physician
  - ENT
  - Posturologist
  - Orofacial Myofunctional Therapist
  - TMJ / Orofacial Pain Specialist
Conclusion

- Do you have FHP?
- Do you have lips open posture? Tongue forward at rest?
- Do your patients have them?
- Do you note it in your assessment chart?
Conclusion

1. The most common postural disorders are FHP and open mouth posture, which cause cascading effects on oral functions, especially when nasal breathing is reduced or absent.

2. Posture is involved in swallowing disorders, especially atypical swallowing, and their treatment, by changing the delicate tension of the tongue extrinsic muscles, connective tissues and the jaw.

3. A multidisciplinary approach to swallowing and postural disorders is needed, especially if nasal breathing is compromised.
Thank you!

Thank you so much for your attention

Questions?

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