OCCLUSION AND POSTURE - A REVIEW

Geethanjali P and Deviprasad Nooji

Department of Prosthodontics, K.V.G. Dental College and Hospital, Sullia, DK. Karnataka -574239, India

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ABSTRACT

The connection among stomatognatic and postural framework has long-term been examined among specialists in human services. But a certain amount of perplexity still obscure the subject because of the wide decent diversity of therapeutic methodologies structured to deal with it and the shortcoming of methodological design in the scientific researches that have been studied and published on it till date. Infact the physiological continuum that links occlusion and posture does not seem to be rare and direct connection, but rather a complex set of many contributing elements. The main objective of this review is to try to understand this amusing neurophysiological web through the examination of the already accomplished knowledge in order to find out the positive aspects that allow us to say whether a postural approach should be used during the dental treatment or not.

INTRODUCTION

The purpose of any dental treatment is to optimize the en masse of orofacial functioning and to improve the equilibrium of teeth in the arches, in association to skeletal structures, to the periodontium, to the joints, to bodily posture, and to the biopsychosocial actions of the patient1. Sherrington2,3 said that the basis of movement is posture and all movement begins and ends in posture. There appears to be two school of thoughts which can be summarized as i) postural position is stable throughout the life4 ii) postural position is ever changing5. First thought was supported by Thompson5 and Brodie5,6 and the latter by Atwood7 and Posselt8.

It is also believed that postural problems do have a correlation between the patient’s cognitive and emotional status9. In a very general way of all the fields in dentistry, we are living in an era in which postural considerations are being harmonized into our therapy10. Also recently many postural diseases have been classified among occlusal-functional alterations, mostly on a clinical basis11; however some anatomic and physiologic aspects are still unknown12. The dental practitioners all around the world believe that there is a strong inter-relationship between occlusion and posture which are governed by common neurological control systems and has become a leading research topic13. We all should remember that the “postural dimension” always relies majorly on holistic medical approaches like energetic, applied chiropractic, osteopathy and Chinese medicine, none of which are noted for their adherence to the evidence based approach13.

Occlusion in dental context is simply defined as contact of orofacial functioning and to improve the equilibrium of teeth10. Postural sustenance is based on feedback and feedforward responses that undoubtedly depend back on information arising from the visual apparatus and from the proprioceptive and vestibular systems10. The proprioception is particularly precised and developed at the mandibular level. Mandibular proprioception which is arising from the masticatory muscle system receptors (neuromuscular spindles, Golgi tendon organs), the periodontal ligament receptors (encapsulated nerve endings) and the temporomandibular joint receptors (Ruffini and Pacini corpuscles, Golgi tendon organs in periarticular tissue and free nerve endings in the subsynovial space), is transmitted to the central nervous system via the trigeminal nerve14.

A study was demonstrated by Gangloff and Perrin who showed that pharmalogically induced unilateral truncular anesthesia of mandibular nerve leads to a serious worsening of balance control measured by stabilometry and clearly stated that jaw position is been influenced by head position15. It was explained later as there exists a connection between the trigeminal and
vestibular nuclei and also vestibulospinal bundle is very important in balance maintenance reactions. The fitness of the masticatory framework relies mostly upon alignment and occlusion of dentition. Occlusal contacts are controlled by Temporomandibular joint (TMJ), dentition and muscles of mastication. The pattern of occlusion greatly authorises the human vital function such as masticating, swallowing and speech. More than static occlusal contacts, dynamic contacts influence the mastication and all other physiological activities. Improper occlusal contacts, inappropriate head postures are considered to be the main causes for the start of pain in the TMJ later followed by TMJ disorders.

A person is usually unconscious of his own muscles even if he’s playing or at work, yet each of them is carefully adjusted to maintain the body at its correct posture. The opening factors include the gravity, suprahyoid and infrahyoid muscles, and postcervical muscles which are the extensor muscles of the skull. The closing factors include the muscles of mastication and the facial muscles. In a close manner, the muscles of mastication and suprahyoid muscles hold the mandible in a postural position. Posselt was the first person to apply this term to mandible, meanwhile many authors have stated that rest position of mandible varies with body posture.

The posture of the head is varied according to the physiological and functional activity of the man. They are divided into an active feeding position posture, upward posture and extended head posture. Incorrect forward head posture is known to cause neck, head, shoulder tension and pain with occlusal changes. Severe dysfunction, leading to TMJ pain and myalgia can be caused by a very few microns of occlusal disturbance. Occlusal indicators can be broadly classified based on their measurement capacity as qualitative and quantitative indicators. Qualitative indicators are the ones which measure only location and number of tooth contacts like articulating paper and articulating silk also commonly used because of their low cost and ease of application. Quantitative indicators include electro-optic and resistive technique such as T-Scan pressure measurement systems which are quite expensive because of their low cost and ease of application. Studies have shown that slight differences in occlusion, even induced by cotton rolls or an occlusal splint effects TMJ which in turn effects posture. To support this Baldini et al experimented this difference using cotton rolls to change the mandibular position and yet proved occlusion has a bigger impact in body sway. Another study by Bracco et al concluded the same results on measuring the effects of three different mandibular positions by using a force platform. Meanwhile some studies also have declined to show the correlation between dental occlusion and body posture, but recent studies have shown that when comparing the significance of occlusion in stable and unstable balance resulted in insignificant difference in stable conditions but markedly significant in unstable balance and fatigue of subjects. Atwood has proven that the presence or absence of dentures always affects the postural position of edentulous patients.

Also authors stated that the significance of jaw on general posture is more from an anatomical support. D‘Attilio et al studied different degrees of cervical lordosis in different skeletal classes, however it showed that degree of cervical lordosis was less in class III, and more in class II comparatively. These differences indicated that there was a
need for antero-posterior equilibrium of the craniocervical complex, a very important aspect given the distance that separates this complex from the ankle, was considered to be the fulcrum around which humans oscillate in order to maintain one’s balance\textsuperscript{51}. Tecce proved that a palatal expansion treatment actually worked in modifying the cervical lordosis, which did not have any clinical importance\textsuperscript{52}. Festa et al\textsuperscript{ proved that cervical lordosis and mandibular length does not have a correlation at all through his cross-sectional study on 70 caucasian adult women by taking lateral skull radiographs in their natural head position(mirror position)\textsuperscript{53}. Researchers have found that increased cranio-cervical angulation is mostly associated with crowding in the lower anterior region\textsuperscript{54,55}. This is supported by a hypothesis which speaks about the stretching of soft tissues is in accordance with patients exhibiting extended craniocervical posture, hinders the sagittal growth of dental arches from the dorsal tension exerted on them\textsuperscript{56,57}. Speaking of maximal biting force, it is always increased in the extended head position than in a natural position\textsuperscript{58}.Maximal biting force is greater when the head is extended than it is when the head is held in a natural position\textsuperscript{59}. 

**CONCLUSION**

The postural position of the mandible is very important to all branches of dentistry because it is the position from which all noncontact movements start and end. Like discussed above there are many articles which says that number of tooth contacts differs in different head position, and likewise in different body postures we see a difference in tooth contacts, occlusal forces, muscle activity and force and also change in the condyle position of TMJ. In the final analysis, by including these postural considerations in our diagnosis, it will take the clinicians to a total corporal analysis of our patients. All these parameters should be taken into consideration before a clinician carries out any dental treatment. This approach will improve our communications with the other health care deliverers and will help us in multi-disciplinary collaboration with other specialities.

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**References**


