Dental occlusion/temporomandibular joint and general body health

Clinical evidence and mechanism of an underestimated relationship

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There have been several studies on the relationship between occlusion/TMJ and general body health. Among other findings, it has been found that lesions in the masticatory muscles or dento-alveolar ligaments can perturb visual stability and thus generate postural imbalance.1 The position and functioning of the mandible also have an effect on the centre of gravity.12

Dental occlusion is associated with reduced lower extremity strength, agility and balance in elderly people.6 The proper functional occlusion of natural or artificial teeth has been shown to play an important role in generating an adequate postural reflex.8 The subgroups of general body conditions associated with TMJ may be divided into the following three categories:

1) Synchronisation of the head and jaw muscles with other muscles
There is a necessary systematic synchronisation of the head and jaw muscles with the other muscles of the body to maintain proper body posture. The functional coupling of the stomatognathic system with the neck muscles is well known. Patients suffering from occlusal or TMJ disorders have frequently reported dysfunction and pain in their neck muscles.14 An imbalance of stomatognathic muscle activity, often leading to neck pain, can be induced by a unilateral loss of occlusal support.15

The biomechanical impact on cervical vertebrae during mastication has been calculated, which confirmed that vertical occlusal alteration can influence stress distribution in the cervical column.15 Possible associations between trunk and cervical asymmetry and facial symmetry have been reported.16 For example, it has been found that visual perception control is most important in orienting the head in the frontal plane.16 A relationship between dental occlusion and postural control has also been postulated.17

2) TMJ and body stability
Dental occlusion/TMJ condition exerts an influence on body stability. Human beings assume a relatively unstable postural state when in the standing position; therefore, the maintenance of a standing position is related to fluctuation in the centre of gravity, which is controlled by information from the ocular region, the three semicircular canals and anti-gravity muscles.18

It has been suggested that occlusion and head position affect the centre of gravity, resulting in an increased risk of falling when abnormal.19 Poor or absent dental occlusion may decrease proprioception in this area, interfering with the proper stability of the head posture.20 It is thought that tooth loss is a risk factor for postural instability.21 Physiologically, mechanical receptors in the periodontal membrane control mandibular movements and coordinate masticatory function,22 and this is related to the motor activity of the neck muscles.23

Fluctuation in the centre of gravity caused by altering the occlusal contact area experimentally was examined experimentally, and the results confirmed that occlusal contact affects gravity fluctuation and that an appropriate occlusion attained by maintaining even occlusal contact in the posterior region is crucial for gravity fluctuation.24

Mechanism of relationship between the TMJ and general body health based on the myofascial aspect
It is the first hypothesis of this article that TMJ and other parts of the body are connected through fasciae, which is a connective element between various anatomical structures,25 and through a multidimensional network extending throughout the whole body.26 This network can be stretched by the contraction of unbalanced muscle, and its transmission over a distance.27,28

The fascial tissues are arranged vertically, head to toe, and four interconnected transverse fascial planes criss-cross the body. Therefore, should an injury occur in one part of the body, both fascial planes and dysfunction may occur throughout the body.29

Mechanism based on qi and the meridian aspect
The second hypothesis is that the TMJ and other parts of the body are connected through the meridian system, which is constituted of the fasciae.

“..lesions in the masticatory muscles or dento-alveolar ligaments can perturb visual stability.”

head, face, or jaw30 Evidence of significant trauma to the TMJ has also been found following hyperextension of the cervical spine.31 With regard to habits, bad posture, bad ergonomics at work, oral and childhood habits, as well as poor diet and strenuous activities such as heavy lifting, have been cited.32

Myofascial pain, deriving from the hyperalgic trigger points located in skeletal muscle and fascia, is commonly characterized by persistent regional pain.33 The myofascial component has generally been considered to be part of pain syndromes that involve TMJ. Trigger points in masticatory muscles are presumably caused by myoocclusion, misalignment and habitual para-function of the jaws, abnormal head and neck postures, or trauma.34

Relationship between TMJ and general body health

There has been much research on the relationship between occlusion/TMJ and general body health. Among other findings, it has been found that lesions in the masticatory muscles or dento-alveolar ligaments can perturb visual stability and thus generate postural imbalance.1 The position and functioning of the mandible also have an effect on the centre of gravity.12

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Traditionally, acupuncture meridians are believed to form a network throughout the body, connecting peripheral tissues to each other. They are thought to form a network of connective tissue permeating the entire body, similar to the fascial planes between muscles and other connective tissues (fascia). Ancient acupuncture texts contain references to techniques that view acupuncture points as discrete entities, which may correspond to certain points of convergence in a network of connective tissue permeating the entire body. For example, the point at which muscular or intramuscular loose connective tissue is interpenetrated by acupuncture points are known as acupuncture points/meridian systems.

In view of experimental evidence, it has been hypothesized that the network of acupuncture meridians can be visualized as a network of connective tissue permeating the entire body, similar to the fascial planes between muscles and other connective tissues (fascia). The analogy between acupuncture points and acupuncture points has been discussed since 1977, when 100% anatomic and 71% clinical pain correspondences for the myofascial trigger points and acupuncture points were reported. A number of similarities between the two have been suggested that the connection between acupuncture points and acupuncture points may correspond to certain points of convergence in a network of connective tissue permeating the entire body, similar to the fascial planes between muscles and other connective tissues (fascia).

Correlation between trigger points and acupuncture points

Although separated by two millenia, the traditions of acupuncture and myofascial pain therapies share fundamental similarities. The correlation between trigger points and acupuncture points clearly need to be further investigated in the future. The fascial connection theory proposes to explain the functional connection between the entire body, including acupuncture points and meridians, and the fascial planes between muscles and other connective tissues (fascia). The correlation between acupuncture points and acupuncture points is considered to be the natural condition. In an effort to restore the natural condition, acupuncture should be built up and maintained in a normal natural condition, while caution for deterioration of the TMJ status should be treated in an effort to restore the natural condition.

3Shape releases its new Dental System™ 2013

3Shape’s Dental System™ 2013 introduces new major indications, a variety of powerful design tools, optimized order-creation, stronger scanner and CAD/CAM software solutions, released its next generation Dental System™ 2013 to the market.

“We are keenly focused on helping labs stay competitive in an industry driven by technology changes, escalating globalization, and increasing regulatory demands,” says Flemming Thorup, President & CEO at 3Shape. “By enhancing ease-of-use in our Dental System 2013, and adding even more major indications that can be provided digitally, we believe that we have significantly increased the productivity and range of services labs can offer at competitive prices.”

New features in Dental System 2013 include:

• New user interface for maximum ease-of-use and simplified design workflows
• A new intuitive workflow progress bar guides users through each design step. The new interface introduces an impressive full Screen design window that maximizes 3D design space.
• Advanced implant bridges with gingiva (“Pretent style™”)
• Design advanced bridges - complete with gingiva, teeth, and implant interfaces in a single smooth workflow. Designs can be milled directly in Zirconia, titanium, PMMA, or other materials.
• New Post and Core design software

Dental System™ 2013 will be available through 3Shape resellers. Actual availability to end-users will depend on the specific system configuration. Please contact your local 3Shape supplier, or visit www.3shapedental.com. For more information regarding reseller information, please visit www.3shapedental.com. For further information regarding 3Shape, please refer to the dental segment based in Denmark, with the regional HQ strategically located around the globe. 3Shape is a Danish company specializing in the development and marketing of 3D scanners and CAD/CAM software solutions designed for the creation, processing, analysis and management of high-quality 3D data for application in complex manufacturing processes. 3Shape envisages the age of the “full digital dental lab,” and its more than 140 developers provide superior innovation power towards realizing this goal. 3Shape’s flexible solutions empower dentists and dental professionals throughout the entire workflow of real workflows, and its systems are applied in thousands of labs in more than 90 countries worldwide, putting 3Shape technologies at the peak of the market in relation to units produced per day by dental technicians. 3Shape’s first-line distributor support network with a second-line support force of more than 20 in-house experts placed in 50 regions worldwide can be contacted at ykleedan@gmail.com.

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