TMJ Pain and Personality Testing
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During the past two decades, many researchers have attempted to examine the potential relationship between temporomandibular dysfunction and psychological abnormalities. The Crown Crisp Experimental Index and Minnesota Multiphasic Personality Inventory (MMPI), among other tests, have been used to assess psychopathological indicators in patients with TMJ syndrome. Unfortunately, the data from these studies are conflicting and suggest both significant and non-significant psychological associations with TMJ dysfunction (alleged indicators of TMJ-associated psychological disturbance have included hypochondriasis, hysteria and anxiety, among other conditions).

In clinical populations, the most frequently reported symptom of TMJ syndrome is pain. When pain is persistent and tends to interfere with a person's ability to function, there are adverse psychological effects, as have been well documented in persons with persistent low back pain and headache. (See also Chapter 30A, Psychological Factors in Low Back Pain, in Courtroom Medicine: The Low Back and Chapter 72, Symptoms, in Courtroom Medicine: Head and Brain. New York: Matthew Bender and Co., Inc., 1984.)

Psychological Evaluations

In 1983, Salter et al. questioned whether or not TMJ pain was the result of a psychological disorder. They investigated TMJ syndrome patients who met the criteria of having ear pain, clicking of the temporomandibular joint, difficulty in opening and closing the jaw and tenderness in the muscles of mastication. TMJ patients who exhibited organic problems were excluded from the study; eligible subjects were grouped according to whether or not the duration of their symptoms was long (six or more months) or short (less than six months). The control cohort included subjects who had reported organic facial pain for a period of five or more months. The Crown-Crisp Experimental Index was used to assess the psychological status and general health of the patients. Interestingly, parental bonding scores were also examined with the assumption that if TMJ were a psychological disorder, there would be evidence of early, disturbed parental bonding.

The data from this study, however, suggested that TMJ patients, in comparison to those with organic facial pain, were not distinguished by any select psychological measures, leading the researchers to question the role of such factors in TMJ dysfunction. In addition, Salter et al. found that persons who had their symptoms for six or more months were indistinguishable from those who had had symptoms for a lesser duration.

The Minnesota Multiphasic Personality Inventory
Internationally, the most widely used measure of personality and psychopathological traits is the Minnesota Multiphasic Personality Inventory (MMPI); it has also been the most extensively utilized instrument in the study of temporomandibular joint syndrome. (See also Chapter 70, Diagnosis, in Courtroom Medicine: Head and Brain. New York: Matthew Bender and Co. Inc., 1985).

The MMPI test originated in the 1930s and is substantiated by criterion-referenced or empirical validity. Criteria were originally chosen from a larger pool of conditions thought representative of various psychopathological disorders. Variables were subsequently included or excluded from the test on the basis of whether they distinguished individuals who were psychologically normal from those with pathological psychiatric disorders. It is important to note that the effects of physical disorders were not taken into account during the development of the MMPI.

**Pain and Illness: Effects on Test Results**

Physical illnesses may affect test performance, thereby making data interpretation more tenuous in individuals with medical problems. Several early studies of MMPI data from facial pain patients suggested that these subjects were characterized by a distinctive personality profile (Shipman, 1973; Schwartz, 1974); however, when control groups were included in the analyses, the evidence for distinct MMPI profiles disappeared (McCall, Symyd and Ritter, 1961; Solberg, Flint and Brantner, 1972; Schwartz, Green and Laskin 1979).

Similar results were obtained in a recent study by Moss and Adams (1984). These investigators looked at psychological test results in three groups of individuals. The first group experienced popping or clicking of the temporomandibular joint on opening or closing of the mouth and had a history of unilateral jaw pain for more than six months. The second group had popping or clicking of the temporomandibular joint but did not experience pain or restricted opening of the mouth (trismus).

The third group consisted of individuals without temporomandibular joint dysfunction. No differences in clinical MMPI scales or other measures of chronic or transient anxiety and depression were found between the various groups. The authors concluded that research in this area appeared fruitless, but that further studies were needed to confirm their findings.

However, contradictory results have been reported by researchers such as Duinkerke et al. (1985) who unlike Moss and Adams examined TMJ patients with persistent pain. These authors have developed a rather elaborate methodology of objective dental procedures to determine (along a continuum) the extent to which any given individual exhibits symptoms of TMJ syndrome. They correlated their data with the Hopkins Symptoms Checklist, as well as with various
psychological and biographical variables, and reported significant correlations between (1) the extent to which TMJ symptoms were present, and (2) scores measuring psychological disturbance and the tendency to somatize.

The most recent clinical data, therefore, indicate that persistent pain significantly affects psychological test results. Furthermore, it has been possible to specify particular psychological scales associated with chronic pain. Chronic pain patients are prone to show abnormal MMPI scores for hypochondriasis, depression and hysteria. Data also suggest that individuals with chronic low back pain are not characterized by abnormal MMPI findings prior to pain onset. Accordingly, the presence of abnormal MMPI findings in the TMJ population would not necessarily indicate that the subjects under study were overly neurotic or prone to develop TMJ syndrome.

It is important to understand that many TMJ patients may develop psychological problems reflected in abnormal MMPI findings as a result of long-term exposure to pain and/or disability. Although abnormal MMPI findings may not have been present prior to TMJ injury, many of these individuals would show predisposing personality factors that would influence their psychological reaction to pain.

**Psychological Profiles**

Measures of the interference of pain and dysfunction on everyday activities have traditionally been obtained for populations with headache and low back pain. (See also Chapter 30A, Psychological Factors in Low Back Pain, in *Courtroom Medicine: The Low Back and Ch. 72, Symptoms, in Courtroom Medicine: Head and Brain*. New York: Matthew Bender and Co., Inc., 1984.) It is clear that individuals who are markedly restricted and who must alter their life-styles because of pain are most prone to show psychological disturbances.

Franz et al. (1986) recently compared the MMPI profiles of subjects with chronic headache or low back pain with those of a control group devoid of health problems. They reported that the MMPIs of both pain groups were abnormal and showed elevations on the scales of hypochondriasis and hysteria. Rather than simply classifying these findings as neurotic disorders, Franz et al. further analyzed their data to determine the specific disturbances that the two pain groups were exhibiting.

They found that pain patients showed greater degrees of mental fatigue, self-distrust, strange bodily sensations and trait anxiety than did controls; they also noted that many of the items on the MMPI scales might be elevated as a result of the physical condition of these patients, rather than any psychopathology.

It was suggested that MMPI items such as "I am about as able to work as I ever was," when endorsed, might not be reflective of psychopathology but rather the intrusive effects of chronic pain. In a similar vein, Philips and Jahanshahi (1985)
reported that individuals with persistent headaches had higher levels of behavioral disruption as the chronicity of the disorder increased.

Results from studies such as these cloud the interpretation of MMPI profiles in that they show the instrument to be lacking in the power to distinguish psychopathology as a cause or effect of persistent pain. It is most unfortunate that published studies in the area of TMJ have not assessed the extent to which pain is a stimulus for psychological disturbance, rather than a result of such disturbance.

**Conclusion**

Although investigators are developing more accurate criteria for the assessment of temporomandibular joint dysfunction, etiological factors are not nearly understood. The physical management of TMJ syndrome has been more thoroughly explored, with conservative dental management by occlusal equilibration and supportive physical and drug therapies being the treatments of choice. Psychological data concerning the relationship between TMJ syndrome and various neurotic states are equivocal; although illness behavior and stressful life events appear to be associated with TMJ pain include EMG biofeedback and relaxation maneuvers.

It has been more than a half century since the original description of TMJ dysfunction by Costen (1934), yet the cause of TMJ dysfunction remains obscure. There does appear to be a clear association between the development of TMJ symptoms and the onset of stressful life circumstances. There also appears to be an association between abnormal illness-seeking behavior and the development of TMJ syndrome.

Research literature that relates TMJ syndrome to states of neuroticism or psychopathology is less clear and contains considerable amounts of conflicting data. The association between pain and TMJ dysfunction is also indefinite. There are indications that some individuals characterized by the presence of TMJ and concurrent neurotic states may be demonstrating a response to pain associated with TMJ; certainly, there is considerable literature to suggest that in other anatomical areas pain is in and of itself a sufficient condition for the development of neurotic personality types.

Recently, there has also been an increase in studies of the psychological management of TMJ syndrome. The predominance of studies in this area have utilized biofeedback and relaxation techniques with apparently good outcomes. Additional psychological procedures such as hypnosis, psychotherapy, behavioral management, stress reduction techniques and so on have not, however, been studied to any extent.

There are rays of hope emerging for future clarification of TMJ disorder. Some
investigators have developed reliable, standardized protocols for the assessment of TMJ dysfunction, and it is likely that there will be more precision in the identification of individuals with this syndrome. It is clear, however, more research is needed, yet there is considerable potential for collaboration between professionals in both dentistry and psychology.

**Glossary of Terms**

**Ankylosis:** Joint stiffness or fixation due to disease or congenital process, characterized by fibrous or bony union across the joint.

**Arthritis:** Joint inflammation.

- **Rheumatoid:** A chronic, destructive inflammation of a joint. It is of unknown origin and has associated constitutional manifestations. Chronic synovitis and regressive changes in the articular cartilage occur with pain, swelling, deformity, limitation of motion and occasionally ankylosis of the joints. Variable systemic manifestations include weakness, loss of weight, anemia, leukopenia, splenomegaly, lymphadenopathy, and the formation of subcutaneous nodules.

- **Traumatic:** Acute or chronic inflammation of a joint as a result of acute or chronic injury.

**Arthrography:** A diagnostic technique that entails filling the lower, upper, or both joint spaces of the TMJ (or any joint) with a contrast agent to enable radiographic evaluation of the joint and surrounding structures. Used to diagnose or confirm disk displacements and perforations.

**Articulation:** The joining together as a joint.

- **Temporomandibular:** A diarthrodial, sliding hinge (ginglymus) joint. Movement in the upper joint compartment is mostly transitional and the lower joint compartment is mostly rotational. The joint connects the mandibular condyle to the articular fossa of the temporal bone with the temporomandibular disk interposed.

**Biofeedback:** The instrumental process or technique of learning voluntary control over automatically regulated body functions.

**Bruxism:** (1) Clenching or grinding of teeth, especially during sleep.  
(2) The parafunctional grinding of teeth.

**Capsulitis, TMJ:** Inflammatory swelling of the temporomandibular joint capsule due to various causes.

**Centric Relation:** A maxillomandibular relationship in which the condyles articulate with the thinnest avascular portion of their respective disks with the complex in the anterior-superior position against the slopes of the articular eminences. This position is independent of tooth contact and is clinically discernable when the mandible is directed superiorly and anteriorly and is restricted to a rotary movement about a transverse horizontal axis. (This term is becoming obsolete).

**Clicking (temporomandibular joint):** A distinct snapping sound or sensation, usually audible and detectible by stethoscope and palpation, that emanates from the temporomandibular joint(s) during jaw movement. It is often associated with
internal derangements of the temporomandibular joint.

**Early Opening:** A click that occurs at initiation of the translation of the condyle(s).

**Mid-opening:** A click that occurs during midprotrusive translation of the condyle(s).

**Late opening:** A click that occurs just before terminal opening.

**Early closing:** A click that occurs at initiation of retrusive translation.

**Late (terminal) closing:** A click that occurs just before terminal closure.

**Reciprocal:** Paired clicks that occur during opening and closing movements, respectively.

**Closed Lock:** An internal derangement of the temporomandibular joint in which the meniscus is dislocated anteriorly and (usually) medially to the condyle; displacement or dislocation of the meniscus without spontaneous reduction.

**Condyle:** A rounded projection of bone, usually for articulation with another bone.

**Crepitation:** A crackling or grating noise in a joint during movement.

**Disk-condyle complex:** The disk-condyle articulation that functions as a simple hinge joint.

**Cusp:** Pointed or rounded prominence constituting a divisional point on the chewing surface of a tooth.

**Disharmony (occlusal):** A phenomenon in which contacts of opposing occlusal surfaces are not in harmony with other tooth contacts and/or the anatomic and physiologic components of the craniomandibular joint.

**Dislocation, condylar (luxation):** A condition in which the condyle is displaced out of the temporal joint surface, but is still within the capsule (usually forward before the eminence).

**Dysfunction:** The presence of disharmony between morphological form (occlusion, joints) and neuromuscular function that may result in pathologic changes in the tissues or produce a functional disturbance.

**Equilibration:** (1) The act(s) of placing a body in the state of equilibrium.

(2) The state or condition of being in equilibrium.

**Fossa:** A hollow or depressed area.

**Glenoid Tubercle:** A downward extension of bone between the glenoid fossa and the eardrum that creates the posterior wall of the fossa.

**Interarticular Disk:** A pad composed of fibrocartilage, or a thin, oval pad between the condyle of the mandible and the mandibular fossa that separates the joint.

**Intercuspal:** The fitting together of the cusps of opposing teeth when the mouth is closed in proper occlusion.

**Intercuspation, maximum:** The complete intercuspation of the opposing teeth independent of condylar position. [Objectionable terms: acquired occlusion, adaptive occlusion, intercuspal occlusion, interdigitated occlusion]

**Mandibular process:** The articular process of the mandible.

**Masticatory system:** The organs and structures primarily functioning in mastication. These include the teeth with their supporting structures; craniomandibular articulations; mandibular posturing and accessory musculature;
tongue, lips, cheeks, oral mucosa and the associated neurologic complex.

**Muscles:**

**Muscles of Mastication:**
- **Masseter:** Located on each side of the face; responsible for raising the jaws. Produces the fullness of the posterior part of the cheek.
- **Lateral pterygoid:** Located on the anterior of the cheek; responsible for protrusion of the mandible, moving the mandible from side to side and opening the jaws. This muscle group runs horizontally.
- **Medial pterygoid:** Located inside the lateral pterygoid, corresponding to the masseter on the outside.
- **Temporalis:** Located above each temple; responsible for closing the jaws.

**Suprahyoid Muscles:** Geniohyoid, Stylo-hyoid, Mylohyoid, Digastric; A group of muscles generally located above the hyoid bone in the neck. They elevate the hyoid, lower the jaw and are responsible for initial swallowing of food and for preventing the return of food to the mouth.

**Infrahyoid Muscles:** Sternohyoid, Sterno-thyroid, Thyrohyoid, Omo-hyoid; A group of muscles located between the mandible (jaw) and the clavicle (collar bone). They depress the hyoid bone and larynx after they have been elevated through swallowing.

**Posterior Neck Muscles:**
- **Sternocleidomastoid:** A muscle situated on either side of the neck that is responsible for flexing and rotating the head and for bending and lateral movement of the head.
- **Trapezius:** A muscle that extends from the occipital bone (base of skull) to the clavicle (collar bone) and from the cervical and thoracic vertebrae to the scapula (shoulder blade). It serves to raise, lower and shrug the shoulders and aids in head extension. It is also responsible for complex movement of the shoulder blades together with movement of the head.

**Myofascial trigger point:** A hyperirritable spot, usually within a taut bank of skeletal muscle or in the muscle fascia, which is painful on compression and can give rise to characteristic referred pain, tenderness (secondary to hyperalgesia) and autonomic phenomena.

**Occlusal:** The modification of occlusal forms of teeth with the intent of equalizing occlusal stress, producing simultaneous occlusal contacts, or harmonizing cuspal relations.

**Occlusal device:** Any removable artificial occlusal surface used for diagnosis or therapy regarding the relationship of the mandible to the maxillae. It may be used for stabilization, for TMJ dysfunction therapy, or to prevent wear of the dentition.

**Occlusal prematurity:** Any contact of opposing teeth that occurs before the planned intercuspsation.

**Occlusal splint:** [Generic term] See occlusal device.

**Occlusion:** (1) The act or process of closure or of being closed or shut off.
(2) The static relationship between the incising or masticating surfaces of the maxillary or mandibular teeth or tooth analogues.
(3) The correspondence of the teeth of the upper and lower jaws when
the mouth is closed.

**Occlusal Disease:** All pathological changes that result from an occlusion.

**Pulpitis:** Inflammation of the dental pulp.

**Stomatognathic:** Denoting the mouth and jaws.

**Tinnitus:** A noise in the ears, such as ringing or roaring.

**Veinules:** Small veins.

References

- Schwartz, 1974.
- Solberg, W.K., Flint, R.T., and Bratner, J.P. Temporomandibular Joint Pain and Dysfunction: A Clinical Study of Emotional and Occlusal