

TMD Diagnosis and Treatment: Moving Away from Reliance on Clinician Experience Towards More Evidence Based Decisions

GM Tartaglia*¹, Maspero C¹ and Connelly ST²

*1*Department of Biomedical, Surgical and Dental Sciences, School of Dentistry, University of Milan, Italy

*2*Department of Oral & Maxillofacial Surgery, University of California, San Francisco, San Francisco, USA

***Corresponding author:** GM Tartaglia, Department of Biomedical, Surgical and Dental Sciences, School of Dentistry, University of Milan, Italy



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ABSTRACT

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Editorial

The healthy and intact masticatory system consists of biomechanical and neurobiological pathways that regulate a complex biological mechanism(s). These pathways are controlled both consciously by the central nervous system (CNS) and unconsciously by the brain stem. Among the functions of the masticatory system there are not only food processing and intake (chewing and swallowing) but also phonation and—partially—facial expression (mimicry). These functions are based on neural control of the masticatory muscles for force development and movement production. Humans ingest food and communicate verbally and nonverbally with the environment by dynamically adjusting tissues and parts of the masticatory system, airflow, and forces of the jaw adductors. A dysfunction of the masticatory system not only affects fundamental biological aspects of life but also psychological well-being and social communication (biopsychosocial model) [1]. Temporomandibular disorder (TMD) is a “catchall” term that describes different structural and functional disorders of the stomatognathic system. The contemporary gold standard for the diagnosis of TMD is described in the DC/TMD criteria [2]. This is a dual axis framework that consists of a physical diagnosis component (Axis I), after excluding odontogenic diseases or other pain disorders that can occur in the masticatory system, and a self-report psychosocial component (Axis II).

Taken as a whole, the DC/TMD criteria are identified as a reliable and valid tool of contemporary dentistry. This guides the clinician

to base a differential diagnosis of such conditions on information derived from a comprehensive history, clinical examination and when indicated, TMJ imaging [3] and/or supplementary tools such as electromyography [4]. Historically, given the complexities of the TMJ, various treatment approaches, such as conservative versus surgical have been considered. Unfortunately, therapeutic choices have been derived more from individual clinician experience and beliefs rather than from scientific evidence. In the previous century the approach taken to conceptualize the TMJ compared to the others human joints was justified by the unique characteristic of the TMJ and due to the presence of teeth and its mechanism of occlusion between the upper and lower ones. The occlusion is a functional stop, external to the joint, that requires a complex mechanism of rolling and sliding movements (rotation and translation). The interaction between the occlusion and the joint was thought to be of primary importance, with the observation that, across mammals, the form of the TMJ depends on function, which is mostly driven by masticatory demands and head position. These are evolutionary adaptations to species-specific demands placed on the joint, which for humans includes omnivorous diet, communication and the “human standing characteristic position”. Based on this assumption in the previous era, it was not completely unreasonable that some malalignment of the dental occlusion during static or dynamic functions of the masticatory system could be primary driver of pain for the patient. At that time, lead clinicians proposed the initiation of TMD and or TMJ related problems from disharmony of

the morphology of the teeth with the skeleton (TMJ). The fact that there is great variability in the “normal” range of the position of the condyle and TMJ disc main in relation to different morphological features of the teeth, which is an important confounding element of the biological normality, was completely ignored.

Growing evidence in our century has dismantled this approach. Many other factors other than disc position and occlusal morphology contribute to orofacial discomfort or pain. Morphological features of human teeth and their relationship are more related to masticatory efficiency, esthetics and phonetics than orofacial discomfort or pain. The role of “gnathologist” as the dental professionals who take care of jaw dysfunction with a mechanical approach could be considered an ancient myth, however, the label should be contemporarily considered the giant on who’s shoulder stands, using a famous aphorism of Bernard de Chartres. The scientific basis for diagnosis and treatment of TMD should rely on the sound biological principles and standards for the practice of evidence-based medicine and dentistry. Therefore, the clinical activities have to be proposed on that basis and not on clinician experience alone. Moreover, evidence has shown that examination of the dental and skeletal morphology as an explanation for TMJ signs and symptoms is not accurate and does not produce the anticipated results. It is biologically reasonable that the effects of morphology are more related to TMJ load changes than phenomena of disc-condyle relationships or condylar position inside the temporalis fossae. Contemporary gnathology or better stomatognathic function and pathology include the most common types of:

1. Extracapsular (capsular distension and joint load),
2. Intracapsular TMJ disorders (degenerative disease),
3. TMD pain related disorders (muscular pain and disease, arthralgia and headache attributable to TMD),
4. Masticatory dysfunction and pain related disorders,
5. Orofacial pain of neurological origin,
6. Last but not least, the emotional distress related to TMJ problems and orofacial pain.

It is easier for a patient to give credit to mechanical cause-effect theory of TMD disorders than admitting emotional or physiological issues. The mechanical solution to fix dental problems of these patients has to be left to the gnathologist rather than the modern dental caregiver. After all, the TMJ it is just another human joint.

Currently, there is a poor appreciation and understanding of the repercussions from manipulation of the teeth on the whole of the stomatognathic apparatus. These include effects on the

stomatognathic apparatus, which includes the teeth, supporting alveolar structures, bone, muscles, ligaments, nerves, muscles, blood vessels and cartilage. The aforementioned individual specialties, in general, fix only the problem in focus, and are trained to do so using modern techniques. However, they lack a holistic view of how their treatments directly affect the other components of the stomatognathic apparatus and the body as a whole. It is time for our profession to step out of its partitioned compartments, increase our understanding of the whole and then bring that gained appreciation/altered approach back to the specialties to enhance the treatment delivered to patients [5].

Further evidence of this lack of understanding is that it remains a very active debate in the community whether or not the occlusion not in morphological but in functional terms directly contributes to the whole. It is time for us to evolve our understanding of how the teeth/occlusion is connected to the rest of the body and the place to start is with the closest part, the temporomandibular joint, the atlo-occipital joint and its muscles and neurological network. In the past, it has been acceptable to blindly go along treating patients with little consideration to how it affects the jaw joint, the neck muscles and the body as a whole, but now knowing that they all are a part and parcel of maintaining the biomechanical efficiency, we need to understand the biomechanical pathways psychological and genetic that affect the biological mechanisms by informing ourselves, the practitioners and the patient-care providers through strong partnerships with biomechanists and physical therapists. It is important for the profession to also recognize the need for involvement of Medicine – together will address a complex problem of TMJ/TMD disorders and their association with malocclusion and other chronic pain such as backpain.

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