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Current Approach to Temporomandibular Disorders

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Abstract

Temporomandibular disorders (TMD) comprise a complex set of musculoskeletal and functional conditions affecting the temporomandibular joints and/or masticatory muscles. Despite advances in diagnostic and therapeutic approaches, recurrence and chronic symptoms remain common. A growing body of evidence supports a biopsychosocial model, highlighting the interplay of biomechanics, psychoemotional factors, habitual behaviors/lifestyle habits, and sleep disorders in both etiology and treatment. Surgical approach with mini-invasive techniques are the first-line approach for most intra-articular conditions. Muscular dysfunctions can undermine intra-articular treatments unless addressed through structured rehabilitation. This editorial proposes an integrated model combining the intra-articular procedures, Ângelo Botulinum Toxin Protocol®, specialized physiotherapy, sleep improvement, behavioral and emotional interventions. Anxiety, depression, and parafunctional habits significantly contribute to symptom persistence. Caution is advised with intraoral devices and irreversible procedures like third molar extraction, occlusal adjustments, and orthodontics, which must be individually assessed, especially in TMD patients. A comprehensive, multidisciplinary approach targeting mechanical, psychological, and behavioral factors, supported by surgical treatment and ongoing physiotherapy, is essential for long-term clinical success in TMD management.

1. Editorial

Temporomandibular disorders (TMD) represent a multifactorial group of conditions involving the temporomandibular joint (TMJ), masticatory muscles, or both. Despite extensive literature, a universally accepted gold-standard treatment remains without consensus. Historically, intra-articular procedures have received more attention, often undervaluing the role of muscular dysfunctions, emotional regulation, and lifestyle habits in long-term treatment outcomes.

One of the most persistent clinical challenges is the recurrence of intra-articular pathology, even after technically successful interventions. Recent studies and clinical experience suggest that successful management of TMJ disorders requires a comprehensive, biopsychosocial approach, recognizing the dynamic interactions between joint structures, muscle function, psychological status, and patient behavior. Intra-articular improvement is often unsustainable without addressing myofunctional balance and restoring biomechanical harmony between the joint and surrounding musculature [1–3].

Most intra-articular recurrences are associated with undiagnosed or undertreated muscular disorders. Persistent muscle tenderness, imbalance, or hyperactivity can lead to joint overload, perpetuating articular dysfunction [2, 4]. In the author's clinical experience with 6317 first consultations, only 17% were true primary evaluations, while 83% were patients with one or more failed prior treatments. This statistic underscores a systemic oversight in evaluating functional and behavioral contributors to TMD.

TMD management must incorporate a detailed biomechanical analysis, particularly of the temporomandibular joint, masticatory muscles and cervical spine. Altered mandibular movement patterns, asymmetries in muscle activation, and dysfunctional posture contribute to ongoing overload and stress on the TMJ. Without physiotherapeutic intervention, including manual therapy, neuromuscular

reeducation, and postural correction, intra-articular treatments risk temporary relief followed by relapse.

1.1. Intra-articular Procedures

In cases where structural derangement of the TMJ is confirmed by imaging and clinical criteria, mini-invasive surgical interventions are essential. Procedures such as double-portal arthrocentesis, arthroscopic or open joint discopexy have shown promising outcomes [5–7]. When integrated into a structured rehabilitation plan, these surgeries significantly reduce pain, improve function, and prevent further joint degeneration.

In advanced or irreversible cases, such as severe condylar resorption, ankylosis, or repeated surgical failure, reconstruction with custom alloplastic TMJ prosthesis is the gold-standard treatment. Modern imaging and 3D-printing technologies enable patient-specific implants, resulting in better anatomical fit, functional recovery, and long-term success [8–10].

1.2. Psychoemotional and Behavioral Therapy

Beyond the mechanical domain, psychoemotional factors are now widely acknowledged as key drivers of chronicity in TMD. Anxiety, depression, and stress-related disorders influence muscle tone, pain perception, and behavioral habits [11]. Emotional stress can trigger or perpetuate parafunctional activities such as bruxism, clenching, or tongue pressing [3, 4, 11, 12]. Central sensitization mechanisms further amplify symptoms [4].

Psychological assessment, and when appropriate, cognitive behavioral therapy, stress management, and lifestyle coaching, should be integral components of any TMD treatment strategy. Effective communication, empathy, and patient education are equally crucial.

Unconscious behaviors such as poor sleep posture, screen time, chewing habits, and hydration affect TMD outcomes. Strategies like habit reversal training, biofeedback, and ergonomic coaching are effective in managing muscle overuse [3, 11, 12].

Sleep disorders such as insomnia and apnea worsen bruxism and pain sensitivity. Managing sleep should be part of comprehensive care. Diet, exercise, and sleep hygiene impact inflammation and recovery, making lifestyle coaching essential.

1.3. Muscular Treatment and Rehabilitation

Current experience supports the use of botulinum toxin, following the Ângelo Protocol®, with physiotherapy, for muscular TMD [13, 14]. Botulinum toxin reduces hyperactivity in key muscles, allowing retraining. Ideally, only one session of treatment is required, followed by structured rehabilitation.

Physiotherapy should include: trigger point release, stabilization exercises, diaphragmatic breathing, postural training, and education on stress and harmful habits.

1.4. Occlusal and Dental Procedures

Occlusal splints and intraoral devices may help some patients but can also worsen symptoms if not correctly indicated [3, 15–17]. Caution is necessary in prescribing these devices.

Irreversible treatments like third molar extraction, occlusal adjustments or orthodontics should be avoided in TMD patients unless clearly indicated. These interventions may destabilize an already dysfunctional system [16, 17].

2. Conclusion

Intra-articular outcomes require muscular balance [1, 2]. Mini-invasive surgery and prosthetic TMJ reconstruction are essential for structural cases [5–10]. Most recurrences stem from untreated muscle issues [2, 4]. Anxiety, depression, and

overuse behaviors must be addressed [11]. Sleep is vital. The Ângelo Protocol® plus physiotherapy offers effective management [13, 14]. A biomechanical–psychoemotional–behavioral model anchored in physiotherapy and surgical indications ensures long-term success.

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