SURFACE ELECTROMYOGRAPHY ASSESSMENT OF TEMPOROMANDIBULAR DISORDERS: A CLINICAL-OBSERVATIONAL STUDY USING TEETHAN®

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Aim: Temporomandibular disorders (TMDs) are multifactorial conditions affecting the masticatory muscles and temporomandibular joint. This study evaluated occlusal and joint status in adults and correlated these findings with electromyographic activity of the masseter and temporalis muscles.

Methods: twenty dental students (10 males, 10 females) were assessed for TMD signs through medical history, clinical examination, occlusal analysis, Endfeel measurement, and surface electromyography (sEMG) with the Teethan® device. Static and dynamic muscle activity, including chewing, was analyzed. Student's t-test and Pearson's correlation coefficient were used, with $p < 0.05$ considered significant.

Results: sEMG showed significant differences between participants with and without visual correction. Subjects wearing glasses had higher IMPACT values and POC MASS coefficients, suggesting that visual input influences masticatory muscle efficiency. The chewing test identified a chewing side in all participants. Greater muscle activity on the chewing side was associated with more occlusal contacts on the same side. A strong inverse correlation ($r = -0.80$) was found between mandibular torsion (TORS) and Endfeel.

Conclusions: visual input may influence masticatory muscle efficiency. Lateralized neuromuscular activation affects occlusal contact distribution, and the inverse TORS-Endfeel relationship may represent a potential diagnostic marker for TMDs. Limitations include the small sample size and the inclusion of only subjects without TMD symptoms or bruxism.

IMPROVED CLINICAL DIAGNOSIS OF INTRINSIC TEMPOROMANDIBULAR JOINT DISORDERS WITH MAGNETIC RESONANCE IMAGING: A CASE REPORT

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Aim: to present a case of asymmetric disc displacement and evaluate the additional diagnostic value of magnetic resonance imaging (MRI) compared with standardized clinical assessment.

Methodology: a 32-year-old female presented with a six-month history of preauricular pain and limited mouth opening (26 mm). Clinical evaluation using standardized diagnostic criteria indicated bilateral disc displacement without reduction. MRI of both temporomandibular joints was performed using T1- and T2-weighted sequences in the sagittal and coronal planes, with 2 mm slice thickness, in both closed- and open-mouth positions, with an interocclusal device.

Results: MRI demonstrated disc displacement with partial reduction in the right joint and disc displacement without reduction in the left joint. In addition, condylar remodeling with cortical erosion was observed on the left side, along with bilateral reduction of joint space. These findings were only partially consistent with the initial clinical diagnosis.

Conclusions: this case illustrates that clinical examination alone may not fully define the laterality and dynamics of disc displacement in temporomandibular joint disorders. MRI provided additional information regarding disc behavior and associated osseous changes, thereby refining the diagnosis and potentially influencing treatment planning.

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DIGITAL MANAGEMENT AND WORKFLOW OF TEMPOROMANDIBULAR DISORDERS: AN INTEGRATED APPROACH. A CASE REPORT

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Aim: this case report describes the management of moderate temporomandibular disorder (TMD) using a fully digital workflow based on the 3Shape Unite platform and AI-driven design protocols, aiming to improve precision, efficiency, and clinical predictability.

Methods: clinical examination revealed bilateral tenderness of the masseter and temporalis muscles, along with a reciprocal click in the left temporomandibular joint. A diagnosis of myofascial pain with disc displacement with reduction was established. Treatment involved a stabilization splint to deprogram musculature and protect joint structures. Centric Relation was recorded using the Roth Power Centric technique. Neuromuscular deprogramming was achieved through sequential wax registrations to guide proper condylar seating. The anterior wax segment was maintained during intraoral scanning (3Shape TRIOS) to preserve vertical dimension and CR position. Digital models were processed using 3Shape Automate Nightguard. The splint was designed by AI based on four parameters: minimum thickness, offset for passive fit, crevice blockout (100-150 µm), and controlled inward retention. The final STL file was validated using heat maps.

Results: the appliance required minimal adjustments. After one month, the patient reported significant reduction in morning stiffness and muscle tenderness, with stable occlusion.

Conclusions: the integration of Roth Power Centric registration with a digital workflow enables predictable and efficient TMD management, improving accuracy, reducing time, and enhancing patient satisfaction.

NEUROMUSCULAR ADAPTATION FOLLOWING RAPID MAXILLARY EXPANSION: A CLINICAL CASE REPORT USING ELECTROMYOGRAPHIC AND ELECTROGNATHOGRAPHIC ANALYSIS

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Aim: this study investigated the impact of Rapid Maxillary Expansion (RME) on masseter (MM) and anterior temporalis (TA) muscle activity. The aim was to quantify how skeletal correction of transverse maxillary deficiency influences neuromuscular reorganization in a growing patient using digital diagnostics.

Methods: an 8-year-old patient was treated with a Hyrax expander. Surface electromyography (sEMG) and electrognathography (EGN) were performed at baseline (T0) and after expansion (T1). Measurements included resting activity, maximal voluntary clenching (MVC) on cotton rolls and natural teeth, and swallowing patterns. TENS (45 min) assessed muscular deprogramming.

Results: at T1, resting MM activity increased (1.8→2.9 µV) and TA slightly decreased (2.5→2.2 µV). MVC on cotton rolls rose: MM 38.1–44→53.9–61.7 µV; TA 38–39.9→77.6–83.8 µV. On natural teeth, MM reached 60.4 µV and TA 67 µV. EGN showed reduced maximal opening (43.1→36.3 mm) and altered coordination. Post-TENS values remained higher than T0 (2.0–2.2 *vs* 1.6–1.9 µV).

Conclusions: RME triggers a significant increase in masticatory muscle activity, likely via the myotatic reflex and appliance effect. Findings reflect an acute neuromuscular "reprogramming" toward a new skeletal equilibrium. This increased activity is a transient physiological adaptation supporting long-term stability in corrected occlusal relationships.

ORTHOBALANCE: A NEW DEVICE FOR MANAGEMENT OF ORTHOGNATODONTIC DISORDERS

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Aim: evaluate the effects of the Ortobalance device in a patient with articular TMD with deep bite and II canine class, assessing improvements in temporomandibular joint (TMJ) function, dental alignment, and phonetic performance through a single therapeutic approach.

Materials and methods: a 36-year professional singer patient with phonation disorders, episodes of mandibular locking and headache was evaluated with DC/TMD criteria through clinical examination, surface electromyography using Teethan, and mandibular motion analysis performed with Cyclops Itaka. A test phase of rehabilitation in the Schwa mandibular position has begun using a lower Rebalance and an upper tabletop for six weeks. Based on the results of the future gnathological re-evaluation, treatment will proceed with the Ortobalance device.

Results: at placement, the device was perceived as aesthetically pleasant and comfortable, with immediate muscle relaxation and good mandibular stability. During this period the patient often didn't notice the device, especially at night. Chewing function was good. Initial mild difficulties were observed in the articulation of certain consonants during speech and singing, which are likely to improve with progressive adaptation to the new anatomical conditions.

Conclusions: the patient shows a reduction of headache and episodes of mandibular locking. The Ortobalance phase aims to improvedental alignment without stressing the temporomandibular joint (TMJ) and to promote phonetic improvement through increased oral opening, which is beneficial for vocal performance.

EFFECT OF A MAXILLARY FUNCTIONAL BITE ON LOWER-LIMB EXPLOSIVE PERFORMANCE: A 12-MONTH LONGITUDINAL STUDY IN PATIENTS WITH TEMPOROMANDIBULAR DISORDERS (TMD)

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Aim: to evaluate whether the use of an occlusal splint (bite) can influence lower-limb strength and explosive performance during jumping exercises.

Methods: ten patients with temporomandibular disorders (TMD) were analyzed (6 females, 4 males). Following clinical examination, individualized maxillary occlusal splints were fabricated using thermoformed Erkodur material (2 mm thickness) from conventional dental impressions. At the beginning of therapy, jump tests were recorded on a Chronojump platform under three conditions: without splint, with rollers interposed between the dental arches in occlusion, and with a balanced occlusal splint. Participants performed three Squat Jumps in each condition: single-leg Squat Jump with right (sISJ right) and left leg (sISJ left), and with both feet in contact with the platform (SJ). Jump height and power were recorded for each trial. Measurements were repeated quarterly over a 12-month period, with splint control and adjustment performed every 30 days.

Results: statistical analysis using a paired-samples t-test revealed a significant increase in squat jump height when using the occlusal splint (+4,83%, p = 0.016). Neuromuscular stiffness variables (sISJ left and sISJ right) showed a positive trend (+5.45% and +5,22%, respectively), although these differences did not reach statistical significance.

Conclusions: the findings suggest that the use of an occlusal splint may improve vertical explosive performance and certain aspects of neuromuscular coordination. Further studies with larger sample sizes are required to confirm these results.

CORRELATION BETWEEN MALOCCLUSION AND POSTURAL STABILITY IN ATHLETES: A CLINICAL ANALYSIS

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Aim: the aim of this study is to investigate, through surface electromyography (sEMG) of the masticatory muscles and baropodometric platforms, the existence of a correlation between dental occlusion, temporomandibular disorders (TMD), and posture in athletes.
Methods: fourteen competitive athletes (male and female), aged between 22 and 56 years, were evaluated using the Teethan® electromyograph (BTS Bioengineering) and the P-WALK baropodometric platform (BTS Biomedical).
Results: Chi-square analysis revealed no statistically significant association between malocclusion and TMD ($\chi^2 = 1.03$; $p = 0.31$; odds ratio = 6.0; 95% CI: 0.58-61.84). A significant increase in the postural sway area (Δ Area) was observed in subjects with TMD (mean Δ Area = 13.9 mm² ± 8.1 *vs* 4.2 mm² ± 5.6 in subjects without TMD; $t = 2.51$; $p = 0.035$; odds ratio = 15.0). Conversely, the presence of malocclusion was not associated with significant variations in postural stability ($t = 0.45$; $p = 0.66$; odds ratio = 1.0).
Conclusions: in the subjects examined, TMD is associated with greater postural instability during dental occlusion, whereas isolated malocclusion does not represent a risk factor for altered postural balance. These results support the importance of functional and neuromuscular assessment in patients with TMD and suggest a multidisciplinary approach in the management of postural and temporomandibular disorders.

ELECTROMYOGRAPHIC ANALYSIS OF PARAFUNCTIONAL ACTIVITIES: CORRELATIONS WITH PSYCHOSOCIAL PROFILE AND SELF-AWARENESS

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Aim: to evaluate masseter electromyographic (EMG) activity in relation to psychosocial factors and parafunctional self-awareness. The association between psychometric scores and bioelectrical parameters (frequency/duration of contractions) during wakefulness and sleep was investigated.
Methods: 32 adult subjects (18 F, 14 M) were enrolled. The psychobehavioral profile was assessed via validated questionnaires: OBC, 3Q-TMD, PHQ-9, GAD-7, SSAS, and PCS. Masseter activity was monitored for 24h using a portable EMG device, recording frequency, duration, and amplitude of contractions. Data were analyzed using correlation tests ($p < 0,05$).
Results: muscle activity was significantly higher during wakefulness than sleep: 1134 contractions (9356 s) *vs* 92 (666 s). The PCS scale showed a statistically significant inverse correlation with contraction frequency and duration during wakefulness. No significant correlations were found between OBC scores and EMG parameters.
Conclusions: psychological factors, particularly catastrophizing, modulate daytime parafunctional activity. The lack of association between OBC and EMG data suggests that self-assessment questionnaires reflect subjective perception rather than actual muscular effort. An integrated clinical approach, combining EMG monitoring and psychological screening, is essential for diagnosing and managing parafunctions. However, the small sample size and cross-sectional design require further validation through longitudinal studies.

EFFECTIVENESS OF TELEMEDICINE IN MONITORING OROFACIAL PAIN: A CASE-CONTROL STUDY

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Aim: the aim of this study is to evaluate how telemonitoring can improve patient compliance regarding home-based self-massage and functional reducation, leading to superior therapeutic outcomes compared to conventional therapy.

Materials and methods: forty-two patients were recruited and divided into two groups: the Test Group and the Control Group. Both groups underwent an initial protocol involving instructions for self-massage and functional reducation, with monthly follow-ups and outcome reassessments at 3 (T1) and 5(T2) months from the start of treatment. In addition, the Test Group received weekly monitoring via tele-counseling. Data were stored in Excel and analyzed using R software.

Results: at T0, the two groups were homogeneous in terms of gender, maximum pain-free opening, VAS, and OBC-score, with a slight difference in mean age. At T1, the analysis revealed a significant difference in the OBC score, with lower values observed in the Test Group ($p = 0.043$). While both groups showed improvement in functional and pain parameters, no significant differences emerged at T1 regarding jaw opening and VAS scores.

Conclusions: the evidence demonstrates that constant supervision induces immediate behavioral deconditioning in the short term. The recovery of jaw kinematics and pain resolution require more extensive biological timeframes to exhibit statistically significant differences. Nevertheless, the early neurocognitive stabilization of muscular patterns validates teledentistry as an excellent support tool in the management of orofacial pain.

PERSONALITY TRAITS IN PATIENTS WITH TEMPOROMANDIBULAR DISORDERS: A CASE-CONTROL STUDY

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Aim: to investigate the association between temporomandibular disorders (TMD) and maladaptive personality traits, evaluating whether specific psychological domains are correlated with the presence of TMD symptoms.

Methods: a case-control observational study was conducted on subjects with TMD symptoms (pain, joint sounds, or functional limitations) and matched controls without TMD.

TMD was identified through clinical evaluation and the use of the TMD Pain Screener. Personality traits were assessed using the PID-5-BF (Personality Inventory for DSM-5 – Brief Form).

Statistical analyses were performed to compare personality domains between groups and to evaluate the association between PID-5-BF scores and the presence of TMD.

Results: patients with TMD showed higher scores in specific personality domains compared to controls.

Statistically significant differences were found in:

- Negative affectivity ($p = 0.024$);
- Antagonism ($p = 0.039$);
- Mean total PID-5-BF score ($p = 0.021$).

No significant differences were observed in the other domains. These results indicate the involvement of specific psychological domains in patients with TMD compared to controls.

Conclusions: the study supports the role of psychological factors in TMD, particularly negative affectivity and antagonism, suggesting that these dimensions may contribute to the modulation of pain perception and chronicity.

An integrated and multidisciplinary approach, combining dental and psychological assessment, may improve the management and treatment of patients with TMD.

CORRELATION BETWEEN THE SEVERITY OF UNILATERAL POSTERIOR CROSSBITE AND THE DEGREE OF CONDYLAR ASYMMETRY

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Aim: to evaluate the association between the severity of unilateral posterior crossbite (UPXB), expressed as the number of posterior teeth involved, and mandibular condylar and ramal asymmetry in mixed dentition patients.

Methods: patients with UPXB were divided into three groups according to the number of posterior teeth in crossbite (1, 2, or 3). Pre-treatment orthopantomograms were analyzed, and condylar and ramal heights were measured using a validated method to calculate asymmetry indices.

Results: the study included 71 mixed dentition patients with UPXB: 26 with 1 posterior tooth in crossbite (12F, 14M; age 8.4 ± 1.7), 18 with 2 teeth (12F, 6M; age 7.7 ± 1.6), and 27 with 3 teeth (14F, 13M; age 7.6 ± 1.2). No significant differences in age or sex were found among groups. Median condylar asymmetry was >6% in all groups. Condylar asymmetry differed significantly by crossbite severity ($p < 0.05$), with higher values in patients with three teeth involved compared to one ($p < 0.01$). A moderate correlation was found between number of teeth and condylar asymmetry (rho = 0.31, $p < 0.01$). No significant differences or correlations were found for ramal asymmetry.

Conclusions: in mixed dentition patients with UPXB, increased malocclusion severity is associated with greater condylar asymmetry. The extent of occlusal involvement may be considered in clinical assessment of mandibular asymmetry during growth.

ASSOCIATION BETWEEN SELF-REPORTED AND EMG-RECORDED DAYTIME AND NIGHTTIME BRUXISM

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Aim: to examine the relationship between self-reported oral parafunctional activities and electromyography (EMG)-measured masticatory muscle activity during wakefulness and sleep, and to assess the impact of emotional distress on these associations.

Methods: a prospective longitudinal study was conducted at Midwestern University (Illinois, USA) and Sacred Heart Catholic University (Rome, Italy). Forty-two dental students (76.2% female, mean age 25.2 ± 2.4 years) wore the portable diaBRUXO® EMG device for 24 hours to record masticatory muscle activity. Participants completed ecological momentary assessments of clenching/grinding and emotional distress at multiple time points. Self-report measures included bruxism frequency, anxiety/depression (NHS), and perceived stress (PSS). Correlations between EMG data, self-reported activities, and distress were analyzed using Spearman's ρ.

Results: self-reported oral behaviors showed weak or no correlation with emotional distress or EMG during sleep. However, self-reported wake parafunctions moderately correlated with EMG activity ($\rho = .38$, $p = .013$) and clenching ($\rho = .62$, $p < .001$). In participants with low stress (PSS <13), self-reported parafunction positively correlated with both daytime and nighttime EMG activity ($\rho \approx .30 – .32$, $p < .05$), while no significant correlations were found in higher-stress participants.

Conclusions: self-reported parafunctional behaviors showed limited agreement with objective EMG data but stronger consistency under low stress conditions. Stress may influence perceived rather than actual parafunctional activity. Portable EMG devices offer added value for objective assessment in bruxism research and clinical monitoring.

ASSOCIATION BETWEEN DEFINITE AWAKE BRUXISM AND SLEEP BRUXISM IN ADULTS

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Aim: the primary aim of the study was to establish the association between definite Awake Bruxism (AB) and Sleep Bruxism (SB) and their possible correlation.

Methods: sixty healthy individuals (78.65% females, mean age 25.39 ± 2.1) underwent 24 hours electromyographic recording of their masseter muscle activity using Dia-BRUXO® device to obtain definite bruxism diagnose. The Personal Bruxism Index during both sleep and wakefulness were used to differentiate between subjects with and without AB and SB. Pearson's test and student's t-test were used to statistically analyze data.

Results: twenty participants (33.3%) presented with significant Sleep Bruxism, and 18 (30%) with Awake Bruxism. Among SB-positive individuals, 9 (45%) also showed AB; among AB-positive individuals, 9 (50%) also showed SB. Pearson's correlation between Awake and Sleep Bruxism Personal Indexes was weak and non-significant ($r = 0.18$, $p = 0.17$). No significant difference in Sleep Bruxism scores was found between participants with and without Awake Bruxism ($t = 1.14$, $p = 0.26$).

Conclusions: based on the preliminary data presented, AB and SB do not appear to have significant association nor correlation; therefor it can be hypothesized that they are two different entities rather than two sides of the same coin.

SALIVARY CORTISOL LEVELS IN LOW AND HIGH DAYTIME ORAL PARAFUNCTION GROUPS

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Aim: oral parafunctions are repetitive, non-functional behaviors with a multifactorial etiology. As cortisol is a key biomarker of the neuroendocrine stress response, this study evaluated the association between the frequency of self-reported daytime oral parafunctions and salivary cortisol levels in healthy students, comparing subjects with low and high activity.

Methods: students from the University of Naples and the University of Turin were screened using the Italian version of Oral Behavior Checklist (OBC-It). Based on the short version (OBC-6 It), subjects were stratified as Low Parafunction (LP, OBC-It 6 ≤ 20th percentile) and High Parafunction (HP, OBC-It 6 ≥ 80th percentile). Participants collected salivary samples at four time points (07:00, 12:00, 16:00, 20:00) using Salivette® kits. Cortisol concentration was measured via competitive ELISA. Data were analyzed using a General Linear Model (GLM) for Repeated Measures ($p < 0.05$).

Results: out of 434 students, 115 were identified as LP and 106 as HP. Saliva was collected from 125 participants; based on inclusion criteria, 76 samples were analyzed (40 LP, 36 HP). No differences in cortisol levels were found between groups at any time point or in the daily mean ($p > 0.05$). Both groups showed a comparable and physiological circadian cortisol pattern.

Conclusions: the frequency of self-reported daytime oral parafunctions is not significantly associated with salivary cortisol levels in healthy students, suggesting these behaviors do not reflect an altered neuroendocrine stress response in this population.

SURFACE ELECTROMYOGRAPHY IN THE DIFFERENTIAL DIAGNOSIS OF TEMPOROMANDIBULAR DISORDERS: DEVELOPMENT OF A PARAMETER CLASSIFICATION ALGORITHM

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Aim: the objective of this study was to evaluate the clinical reliability of surface electromyography performed using the Teethan device in assessing neuromuscular masticatory function in patients with Temporomandibular Disorders (TMD). The study investigated whether electromyographic indices could discriminate functional patterns among muscular TMD, articular TMD, and healthy subjects, and whether these parameters were clinically meaningful only when supported by DC/TMD criteria.

Methods: a total of 212 subjects were enrolled: 117 with muscular TMD, 69 with articular TMD, and 26 healthy controls. All participants were classified according to DC/TMD criteria. Surface EMG recordings of masseter and anterior temporal muscles were obtained using the Teethan device with disposable electrodes. Examinations were performed in seated position following ISO recommendations, including measurements in maximum intercuspidation and at rest. Recordings lasted five seconds and were repeated three times. Indices assessed symmetry, coordination, and load distribution.

Results: the device showed high reproducibility (ICC > 0.90). Healthy subjects presented balanced activity. Muscular TMD showed increased masseter activation and reduced coordination, while articular TMD showed asymmetry. Data were meaningful only when interpreted with DC/TMD diagnosis.

Conclusions: the Teethan device proved reliable for assessing neuromuscular function, allowing differentiation between healthy and TMD patients. However, sEMG cannot replace clinical diagnosis and must be integrated with DC/TMD criteria.

USE OF SKIN REFERENCES COMPARED TO A GUIDED TEMPLATE PROCEDURE FOR TMJ ARTHROCENTESIS: A PRELIMINAR CBCT STUDY ON HUMAN CADAVER

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Aim: TMJ arthrocentesis is a treatment option for osteoarthrosis or osteoarthritis often performed with freehand manual needle insertion guided by percutaneous markers without relevant side effects. The use of a CBCT surgical guide gives higher precision in needle insertion, depth and stability during the intra-articular lavage. The aim of the study is to evaluate the accuracy of an extraoral CBCT-planned and 3D-printed surgical guide for performing arthrocentesis of the TMJ *versus* the freehand manual procedure. The preliminar study was made with the traditional procedure on one skull from human cadaver of known sex and age in order to understand the limits.

Methods: a standardised multidetector computed tomography (MDCT) scan was performed on the subject with mouth open. For the freehand procedure, two injection sites were planned in the superior articular compartment and 2.0 ml of radiopaque resin was injected. Different percentages of barium were added to the resin to find the correct radio-opacity and test the viscosity. A second CBCT scan was obtained, with needles in place.

Results: no changes in viscosity with resin added of barium at different percentages were found. Addition of barium 20% to the resin may be considered for increasing the radio-opacity for its detection in CBCT.

Conclusions: other tests are necessary in order to standardise the radio-opacity of the resin. Future step will be the comparison between the freehand procedure *versus* the CBCT guided one.

DYSGNATHIES AND DYSLALIAS: CLINICAL CORRELATIONS AND INTERDISCIPLINARY APPROACH

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Aim: dyslalia is a language disorder with incorrect phoneme articulation, considered pathological if persistent beyond age 3, of functional or organic origin. It is often associated with maxillofacial dysmorphisms and oral dysfunction in a bidirectional relationship. This paper reviews the relationship between dyslalia and dysgnathia, highlighting the importance of an interdisciplinary approach.

Methods: a literature review was conducted using PubMed, with keywords "dysgnathia," "dyslalia," "speech therapy," and "malocclusion."

Results: in patients with open bite, the link between dysgnathia and dyslalia is evident. Alterations in sibilant consonants (S, Z, F, V) are related to abnormal tongue position and intraoral airflow changes. Severity of phonetic defects does not always match malocclusion extent due to compensatory mechanisms. Disorders increase with more severe dentomaxillary abnormalities or during mixed dentition; generally, the greater the dysgnathia severity, the higher the dyslalia risk.

Conclusions: literature shows a close correlation between craniofacial dysmorphisms and phonetic alterations, with reciprocal influence between neuromuscular dysfunctions and morphological changes, underscoring the need for an interdisciplinary approach. While the correlation is clear, the causal link and optimal therapeutic strategies during growth remain uncertain.

INFLUENCE OF THE ANDRESEN FUNCTIONAL APPLIANCE ON THE ELECTROMYOGRAPHIC ACTIVITY OF THE MASTICATORY MUSCLES. A LITERATURE REVIEW

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Aim: to review the literature evaluating the association between the use of Andresen functional appliance and neuromuscular changes in masticatory muscles and to discuss the different hypotheses.

Methods: a systematic review was conducted on the MEDLINE database to evaluate the association between functional appliances particularly the Andresen functional appliance and neuromuscular changes. The search used the keywords: "EMG and functional appliances", "EMG and Andresen activator" and "Class II malocclusions". Only articles published between 2000 and 2025 were considered.

Results: several studies that investigated the effect of functional appliances on the electromyographic activity of the masticatory muscles were found. The results were varied and sometimes contradictory, and multiple hypotheses were proposed to explain the observed neuromuscular changes.

Conclusions: based on current scientific evidence, neuromuscular adaptations resulting in modifications of muscle tone always occur regardless of the type of functional appliance used. Several hypotheses have been proposed and discussed, but the precise mechanisms remain unclear.

OBSTRUCTIVE SLEEP APNEA SYNDROME: A LITERATURE REVIEW

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Aim: to analyze the current literature on Obstructive Sleep Apnea Syndrome (OSAS), focusing on epidemiology, etiopathogenesis, diagnostic methods, and therapeutic options, highlighting the importance of a multidisciplinary approach and the role of the orthodontist in clinical management.

Methods: a literature review was conducted using the MEDLINE database. Scientific articles published between 2000 and 2025 were screened. About 2,000 publications concerning human clinical studies were analyzed and integrated with data from specialized textbooks and peer-reviewed journals. Articles were selected based on relevance to epidemiology, pathophysiology, diagnosis, and treatment outcomes.

Results: the prevalence of OSAS is estimated at 2-4% in adult men and 1-2% in women. The condition results from anatomical factors, such as upper airway narrowing and craniofacial anomalies, and neuromuscular dysfunction. Typical symptoms include habitual snoring, morning headache, and excessive daytime sleepiness. Polysomnography remains the gold standard for diagnosis based on the Apnea-Hypopnea Index (AHI). Treatment options include CPAP, surgery, and oral appliances. Mandibular advancement devices (MADs) are effective in mild to moderate OSAS and in patients intolerant to CPAP.

Conclusions: OSAS is associated with systemic complications such as cardiovascular disease and hypertension, making early diagnosis essential. Orthodontists play a key role within the multidisciplinary team by identifying craniofacial risk factors and contributing to clinical management.

IMPACT OF MOUTHGUARD TYPE ON NEUROMUSCULAR RECRUITMENT AND DYNAMIC POSTURE IN RUGBY PLAYERS

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Aim: this study evaluates the influence of mouthguard on muscle performance in rugby players, comparing a custom-made mouthguard, a boil-and-bite device, and no mouthguard on the electromyographic recruitment of masticatory and compensatory muscles. The analysis focuses on signal intensity, bilateral symmetry, and anterior-posterior compensation patterns. The study was approved by the Ethics Committee (protocol no. 4932/25, 06/18/2025) and conducted in accordance with the Declaration of Helsinki.

Methods: 10 athletes underwent a gnathological assessment according to DC/TMD, followed by fabrication of a custom mouthguard. Surface electromyography was then performed under three conditions (no mouthguard, boil-and-bite, custom mouthguard) on 12 bilateral muscles. Muscle activity was recorded during a squat jump using a stabilometric platform and the BTS SMART-DX optoelectronic system. Biomechanical and kinematic parameters (flight time, contact time, and jump height) were also collected.

Results: mouthguard use produced interindividual variations in muscle activation. A modulation of activity related to stomatognathic stimulation was observed, suggesting a potential role of oral afferents in postural regulation.

Conclusions: these findings highlight the complexity of postural control under dynamic conditions and suggest new perspectives for training and rehabilitation in high-intensity sports, supporting a multidisciplinary approach to athlete management.

EFFECTS OF TEMPOROMANDIBULAR PAIN THERAPY ON OCCLUSAL TACTILE SENSITIVITY

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Aim: the aim of the study was to evaluate the effects of temporomandibular pain therapy (TMD-P) on occlusal tactile sensitivity (OTA) after usual therapy.

Methods: thirty patients (21 females and 9 males) who had a diagnosis of TMD-P according to the DC/TMD criteria were included. OTA was tested with 10 different thicknesses: 9 aluminium foils (8 µm-72 µm with a constant increment of 8 µm) and 1 sham test (without foil). Each thickness was tested 5 times in random order (50 tests in total). Once the foil was placed between the first molars, the patient was asked to gently close their mouth once, in the usual position, and to report with a "YES" or "NO" whether they perceived a thickness between their teeth. Responses were considered correct when the patient recognised the presence or absence of the foil, and the mean percentage of correct answers was computed. OTA was recorded three times: baseline (T0), after one month of therapy (T1) and after 3 months of therapy (T2).

Results: the results show a significant change of OTA among timepoints. Significant increased perception was observed for thicknesses between 8 µm and 40 µm ($P < 0.001$) after treatment. Patients correctly recognised the absence of lamina in most tests at all three time points (>98%).

Conclusions: treatments directed to reduce the TMD-P seemed to also have an indirect effect on occlusal perception, thus supporting the role of central sensitisation in OTA perception.

ASSESSMENT OF TEMPOROMANDIBULAR DISORDERS IN ADOLESCENTS WITH ANOREXIA NERVOSA: A PILOT STUDY

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Aim: eating disorders such as anorexia nervosa (AN) are psychiatric conditions mainly related to body image, food, and self-perception. Orofacial symptoms (e.g., facial pain or jaw fatigue) have not been previously investigated. This study aimed to assess the presence of temporomandibular disorders (TMD) in adolescents with AN using DC/TMD criteria.

Materials and methods: female adolescents (12-17 years) diagnosed with AN were consecutively enrolled during hospitalization (October 2025-January 2026) at the Child Neuropsychiatry Unit of the University of Campania Luigi Vanvitelli, Naples. All patients underwent standardized DC/TMD assessment, including the TMD Pain Screener (last 30 days), orofacial pain questionnaire, Jaw Functional Limitation Scale, PHQ-4 for psychological distress, and clinical TMJ examination. Data were analyzed using descriptive statistics.

Results: sixteen adolescents (mean age 14.3 years) were examined. The TMD Pain Screener showed that 18.7% reported occasional orofacial pain, while 81.3% reported no significant pain. Clinical diagnosis of TMD was found in 12.5%: one case of disc displacement without reduction and one of myalgia with myofascial pain and TMD-related headache. Joint noises were observed in 12.5% of patients. Most subjects (62.5%) showed no relevant mandibular functional limitations. PHQ-4 scores indicated high psychological distress in most participants.

Conclusions: in this preliminary cohort of hospitalized adolescents with AN, TMD prevalence was low, whereas psychological distress was consistently high. Further studies with larger samples are needed.

EFFECTS OF STANDARDIZED COGNITIVE TASKS ON OCCLUSAL TACTILE ACUITY IN SUBJECTS WITH DIFFERENT LEVELS OF ORAL PARAFUNCTIONAL ACTIVITY

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Aim: Occlusal tactile acuity (OTA) reflects the ability to discriminate subtle interocclusal contacts and shows marked interindividual variability. This study evaluated whether acute cognitive modulation (stress and relaxation) affects OTA differently in subjects with high (HFP) and low (LFP) oral parafunctional activity.

Methods: a total of 325 healthy adults completed the Oral Behavior Checklist. Sixty participants were selected and stratified into HFP (n = 30) and LFP (n = 30) groups. OTA was assessed as detection thresholds of aluminum foils placed between molars at baseline, after a mental arithmetic stress task, and after a music-based relaxation task.

Results: stress increased OTA in both groups, with a greater effect on LFP subjects; no significant change was observed in HFP. Relaxation did not modify OTA in either group. HFP participants showed consistently higher OTA across all conditions.

Conclusions: OTA is modulated by acute stress, with effects dependent on parafunctional status. High parafunction is associated with a persistently altered sensory profile, which may have clinical relevance in restorative dentistry.

EFFECTS OF BRIEF PSYCHOTHERAPEUTIC INTERVENTION IN PATIENTS WITH TEMPOROMANDIBULAR DISORDERS

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Aim: this study aimed to evaluate the effects of a brief psychotherapeutic intervention in patients with temporomandibular disorders (TMD), focusing on its impact on anamnestic pain (AP) and clinical pain (CP).

Materials and methods: thirty patients with TMD (mean age 36 ± 10.9 years) were enrolled and randomly assigned to two groups: a control group receiving physiotherapy and occlusal therapy (F/O, n = 15) and an experimental group receiving the same treatment plus cognitive-behavioral psychotherapy (F/O + Psy, n = 15; 24 sessions). Chronic pain was assessed using the Anamnestic Pain Scale and Clinical Pain Scale at baseline, 12 weeks, and six months. Data were analyzed using mean values and Pearson's correlation coefficient.

Results: baseline AP scores were similar between groups. At 12 weeks, both showed significant reductions with no between-group differences. At six months, the F/O group showed partial relapse, while the F/O + Psy group maintained improvements. CP followed a similar pattern, decreasing in both groups at 12 weeks but remaining stable only in the F/O + Psy group at follow-up. The combined treatment showed greater statistical significance ($p < 0.001$).

Conclusions: both interventions were effective in the short and medium term; however, only the addition of psychotherapy produced stable, long-term improvements in both AP and CP. These findings suggest that integrating psychological treatment into TMD management may enhance sustained pain relief and support long-term functional outcomes in affected patients.

POLYGRAPHIC STUDY OF THE ORAL COMPONENT OF SWALLOWING: DIFFERENCES BETWEEN SPONTANEOUS AND VOLUNTARY SALIVA SWALLOWING – A RETROSPECTIVE STUDY

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Aim: swallowing assessment is central to the evaluation of stomatognathic function, yet induced tasks may alter its physiological execution. The role of occlusal contact during spontaneous saliva swallowing remains incompletely characterized. This study aims to evaluate neuromuscular activity, mandibular kinematics, and swallowing duration during spontaneous and voluntary saliva swallowing using integrated polygraphy in healthy adults.

Methods: this retrospective observational study analyzed computerized surface electromyography (sEMG) and mandibular kinesiography in 220 healthy subjects. Swallowing events were classified as occlusal (OSW) or non-occlusal (NOSW), and muscle activation and timing parameters were compared between spontaneous and voluntary conditions.

Results: voluntary swallowing showed significantly higher electromyographic activity and longer stomatognathic engagement than spontaneous swallowing. Subjects with dental Class II/2 and Class III exhibited longer swallowing times. Occlusal swallowing was consistently associated with higher sEMG values, including a subgroup with marked neuromuscular hyperactivity.

Conclusions: spontaneous saliva swallowing represents the most physiological reference condition for stomatognathic functional assessment. Integrated polygraphy provides a reliable, non-invasive tool with potential clinical relevance in orthodontic, prosthodontic, and temporomandibular disorder evaluation.

CORRELATION BETWEEN SKELETAL CLASS II AND TEMPOROMANDIBULAR DISORDERS

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Aim: Temporomandibular disorders (TMD) are a heterogeneous group affecting the temporomandibular joint, masticatory muscles, and associated structures, causing orofacial pain, joint sounds, and functional alterations. This review aimed to investigate the association between skeletal Class II malocclusion and TMD, evaluating whether this pattern may predispose to TMD.

Methods: a MEDLINE (PubMed) search yielded 290 articles published between 1983 and April 2024. Inclusion criteria were studies on humans or cadavers, RCTs, longitudinal, retrospective, prospective studies, and systematic reviews. After screening, 23 full-text articles were selected. Studies primarily examined TMD prevalence and severity among different skeletal patterns. A pilot study included 55 subjects (mean age 18 ± 1.3 years) divided by TMD presence. Skeletal classification used the ANB angle; TMD was assessed via the Helkimo Clinical Dysfunction Index.

Results: evidence suggests occlusal and skeletal discrepancies are not primary causes of TMD. Several studies report higher prevalence of skeletal Class II patterns among patients with TMD. In the pilot study, almost half of subjects with TMD had skeletal Class II malocclusion, and most dysfunctions were mild per the Helkimo index.

Conclusions: skeletal Class II malocclusion may be a contributing or predisposing factor rather than a direct cause of TMD. Further well-designed studies with larger samples are needed to clarify the role of skeletal patterns in the multifactorial etiology of TMD.