Literature Abstracts

Andrade KM, Rodrigues CA, Watanabe PC, Mazzetto MO. Styloid process elongation and calcification in subjects with tmd: clinical and radiographic aspects. Braz Dent J. 2012;23(4): 443-50. [Medline: [23207864](#)]

This paper aims to find a possible correlation between the presence of TMD and elongation of the styloid process as well relate to presence of calcification of the stilo-hyoid chain. Fifty patients with TMD, confirmed from the RDC/TMD, were examined clinically and radiographically. Radiographic documentation consisted of digital panoramic radiograph and digital lateral cephalometric radiograph. Radiocef software (Radiomemory) was used for the analysis of radiographs by means of specific cephalometric tracing and linear measurements of the styloid process. Each radiograph was traced and measured three times with intervals of 1 month to spread the error. Statistical analysis was performed by Pearson's test ($P = 0.001$) using Biostat 4.0 statistical software.

The authors found that the time between the occurrence of symptoms and onset of pain symptoms ranged around 1 - 20 years, and 16 subjects (32%) claimed to feel orofacial pain for 10 years or more. On the frequency of pain, 20 subjects (40%) had orofacial pain all the time and 30 (60%) reported that the pain comes and goes. On the current pain, the scores were between 3 - 8 points in VAS scale. In the clinical evaluation, 10 subjects (20%) had mouth opening limitation (< 40 mm) and the vast majority showed deviation from the mean and standard deviation with opening.

Joint sounds were assessed by performing palpation and auscultation of the joints through the stethoscope during opening and closing the jaw, as well as by measurements of mandibular movements. As a result, 26 individuals (52%) had some noise in the joint during the clinical examination, with cracking being the most prevalent noise, followed by coarse crepitus and fine crepitus.

Regarding the assessment of symptoms (orofacial pain, headaches, tinnitus and vertigo) obtained with the VAS scale, orofacial pain was the most common symptom (100%), followed by headache (92%), tinnitus (76%) and dizziness (72%). The first data to be analyzed were the values of the length of the styloid process bilaterally on the panoramic radiographs, showing the three measurements and the mean of these values. Measurements the length of the styloid process ranged from 14.32 to 67.81 mm on the right side (mean value of 32.98 mm), and from 15.76 to 58.95 mm on the left

side (mean value of 33.50 mm).

Seventy-six percent of individuals had at least one of the styloid processes elongated, and there was variation in the distribution of occurrence of normal process (24%), unilateral elongation (22%) or bilateral (54%) elongation.

To analyze the variance between the three measurements of the length of the styloid process on the right side and on the left side, correlation was made by Pearson's correlation. By this test, it is possible to obtain the correlation between the data, as a result ranging from -1 to 1. The closer the Pearson's coefficient (r) is to 1, the stronger the association between the data.

In this first analysis, it was observed a very strong association among the three measurements on each side, with Pearson's correlation coefficient ($r = 0.99$), which shows a low error among them. It was also observed that for the three measurements in both the right and the left, scores were very close, which translates into greater reliability of the data.

After verification of the strong correlation and reliability of the data, it was analyzed the relationship between the length of the styloid process found on the right and left. It was found a slight tendency to the occurrence of elongation in the left side (68%). As a result, it was found a Pearson's correlation coefficient of $r = 0.8108$ and $P > 0.01$, indicating that, although numerically different, there was no significant difference between measurements of left and right in this population.

In the cephalometric radiographs, the data resulting from measuring the length of the styloid process also demonstrated values with low variation between measurements and high data reliability, with Pearson's correlation coefficient (r) very close to 0.99 (1st and 2nd analysis: 0.9895; 1st and 3rd analysis: 0.9931, 2nd and 3rd analysis: 0.9935). The styloid length measurements in cephalometric radiography ranged from 15.06 mm to 62.08 mm (mean value of 32.39 mm).

Pearson's correlation was used again to determine if there was correlation between the lengths of the styloid process measured on panoramic radiographs with the lengths measured on cephalometric radiographs.

The correlation was made with the mean length of the styloid process of the right side measured on panoramic radiographs and the mean length of the styloid process measured on the cephalometric radiographs. The result was a high Pearson's correlation coefficient ($r = 0.9825$ and $P < 0.0001$). This indicates that there is a high correlation and so measurements of the length of the styloid process on the panoramic radiograph obtained were similar to measurements on cephalometric radiographs.

It is worth mentioning that, due to geometric factors, cephalometric radiographs provide better radiographic

position and lower distortion, resulting in values closer to the real (9). In the present study, the measurements obtained from the cephalometric radiographs resulted in lower values for the styloid process.

Measurements of the length of the styloid process were also correlated between the three groups with different pain intensity. ANOVA and Tukey's test were used for data analysis, using the mean length of the styloid process of the groups. A significance level of 5% was adopted.

In this way, it could be observed that the elongated styloid process interfere with the severity of symptoms. Due to the location of the styloid process, theoretically according to its position (length), the apex of the process can press blood vessels and nerves causing pain.

Data from the styloid process length obtained from measurements on panoramic radiographs were correlated between the groups with "severe pain", "moderate pain" and "mild pain" separately for each of the symptoms (orofacial pain, headaches, tinnitus and vertigo). The results were the values $P > 0.05$. Therefore, there was no statistically significant difference between the styloid process length and intensity of symptoms in both groups.

It was concluded that no statistically significant association was found between the morphological changes in the length of the styloid process and symptoms of TMD (orofacial pain, headaches, tinnitus and vertigo). However, by analyzing the means and standard deviations of the measurements performed in the styloid chain there was a tendency to greater lengths of the styloid process in patients with higher pain intensity, especially for tinnitus. In addition, measurements of the length of the styloid process on panoramic radiographs were statistically similar to those obtained on cephalometric radiographs.

Amir I, Yeo JC, Ram B. Audit of CT scanning of paranasal sinuses in patients referred with facial pain. *Rhinology*. 2012 Dec;50(4):442-6. [Medline: [23181257](#)]

Computed tomography (CT) scans are performed by some clinicians in the belief that they are a useful primary investigation in patients with facial pain. The aim of this study was to assess the appropriateness and outcome of sinuses CT scans in patients with facial pain based on the European Position Paper on Chronic Rhinosinusitis and Nasal Polyps (EPOS) 2007 guideline and International Headache Society (IHS) criteria for diagnosing and investigating rhinosinusitis. The first cycle of audit was performed on 50 patients with facial pain who underwent CT scanning. The findings on

nasal endoscopy, Lund-Mackay scores (LMS) of the scans and management of these patients were analysed. Following implementation of the IHS and EPOS criteria, 50 consecutive patients were re-audited.

Results revealed that in the first cycle, 16% of patients had positive nasal endoscopic findings. Thirty patients had LMS of 0 and only 9 showed significant changes ($LMS \geq 8$) on their scans. In the second cycle, only 10 patients underwent CT imaging as per EPOS guideline and 4 of them showed significant changes. The remaining 80% of patients in this cycle were diagnosed and treated for non-sinogenic causes. Authors concluded: applying the IHS and EPOS criteria has reduced the number of inappropriate CT scans requests and allowed consideration of non-sinogenic aetiologies.

Teodoro FC, Tronco Júnior MF, Zampronio AR, Martini AC, Rae GA, Chichorro JG. Peripheral substance P and neurokinin-1 receptors have a role in inflammatory and neuropathic orofacial pain models. *Neuropeptides*. 2012 Nov 21. doi:pii: S0143-4179(12)00110-2. 10.1016/j.npep.2012.10.005. [Epub ahead of print] [Medline: [23177733](#)]

There is accumulating evidence that substance P released from peripheral sensory neurons participates in inflammatory and neuropathic pain. Authors of this study investigated the ability of substance P to induce orofacial nociception and thermal and mechanical hyperalgesia, as well as the role of NK(1) receptors on models of orofacial inflammatory and neuropathic pain. Substance P injected into the upper lip at 1, 10 and 100 µg/50 µL failed to induce nociceptive behavior. Also, substance P (0.1 - 10 µg/50 µL) injected into the upper lip did not evoke orofacial cold hyperalgesia and when injected at 1 µg/50 µL did not induce mechanical hyperalgesia. However, substance P at this latter dose induced orofacial heat hyperalgesia, which was reduced by the pre-treatment of rats with a non-peptide NK(1) receptor antagonist (SR140333B, 3 mg/kg). Systemic treatment with SR140333B (3mg/kg) also reduced carrageenan-induced heat hyperalgesia, but did not exert any influence on carrageenan-induced cold hyperalgesia. Blockade of NK(1) receptors with SR140333B also reduced by about 50% both phases of the formalin response evaluated in the orofacial region. Moreover, heat, but not cold or mechanical, hyperalgesia induced by constriction of the infraorbital nerve, a model of trigeminal neuropathic pain, was abolished by pretreatment with SR140333B. Authors concluded: considering that substance P was peripherally injected (i.e. upper lip) and the NK(1) antagonist used lacks the ability to cross the blood-brain-barrier, our results

demonstrate that the peripheral SP/NK(1) system participates in the heat hyperalgesia associated with inflammation or nerve injury and in the persistent pain evoked by formalin in the orofacial region.

Nkenke E, Vairaktaris E, Bauersachs A, Hertrich K, Stelzle F, Scheller K. Superficial skin sensitivity impairment and skeletal stability after sagittal split ramus osteotomy. J Craniofac Surg. 2012 Nov;23(6):1900-5. [Medline: [23172438](#)]

Adjustable osteosynthesis miniplates are used to facilitate positioning of the mandible after bilateral sagittal split osteotomy (BSSO) to avoid skeletal relapse and occlusal discrepancies. The short Obwegeser BSSO reduces neurosensory disturbances. Adjustable osteosynthesis plates suited for the Obwegeser BSSO are not commercially available. This study tested adjustable miniplates for the short Obwegeser BSSO in advancement of the mandible and correction of facial asymmetry, assessing (1) sensitivity impairment of the lower lip and (2) skeletal stability. A prototype of L-shaped, 6-hole, 2.0 mm miniplate with 2 sliding holes was used. Five patients with facial asymmetry (group 1) and 10 patients with mandibular hypoplasia (group 2) were operated on. Sensitivity of the lower lip was quantified using the pain and thermal sensitivity test before the surgery (T0), 1 week after the surgery (T1), and 12 months after the surgery (T2). The length of the ascending ramus (group 1) and the corpus (group 2) was determined at T1 and T2 using cone beam computed tomographic scans and lateral skull radiographs, respectively. After the surgery, occlusion was adequate. There was no need for revisional surgery. At T2, no patient showed a pathologically reduced sensitivity of the lower lip. The length of the ascending ramus in group 1 and the length of the corpus in group 2 did not have statistically significant changes between T1 and T2. The current study revealed that the adjustable osteosynthesis plates especially designed for the short Obwegeser BSSO can be safely used for the advancement of the mandible and the correction of facial asymmetry, with a minimum risk for neurosensory disturbance and a high skeletal stability.

Nagashima W, Kimura H, Ito M, Tokura T, Arao M, Aleksic B, Yoshida K, Kurita K, Ozaki N. Effectiveness of duloxetine for the treatment of chronic nonorganic orofacial pain. Clin Neuropharmacol. 2012 Nov;35(6):273-7. [Medline: [23123692](#)]

Authors examined the pain-relieving effect of duloxetine on chronic nonorganic orofacial pain (burning mouth syndrome and atypical odontalgia), considering the influence of baseline depressive symptoms. In this study of 12 weeks, duloxetine was administered in a fixed-flexible dose of 20 to 40 mg/d to 41 patients with burning mouth syndrome and/or atypical odontalgia. Pain was evaluated using the visual analog scale (VAS) at baseline and at 2, 4, 6, 8, 10, and 12 weeks of treatment. Depressive symptoms were assessed using the Hamilton Depression Rating Scale at baseline and at 12 weeks of treatment. Authors analyzed the data from 29 patients who completed the study. The VAS score at 12 weeks of treatment was significantly lower than that at baseline. The time course of the VAS scores revealed its significant decrease from 2 weeks of treatment compared to the baseline score. To investigate the influence of baseline depressive symptoms on the pain-relieving effect of duloxetine, the subjects were divided into 2 groups based on the Hamilton Depression Rating Scale score on initial consultation: groups with (≥ 8) and without (≤ 7) depressive symptoms. Two-way repeated-measures analysis of variance revealed no significant interaction between time and initial presence or absence of depression. An additional intent-to-treat last-observation-carried-forward analysis including dropped-out patients revealed a similar result. It was concluded that duloxetine significantly relieved chronic nonorganic orofacial pain. Its pain-relieving effect appeared from 2 weeks of treatment. Furthermore, the pain-relieving effects of duloxetine similarly appeared regardless of the presence or absence of baseline depressive symptoms.

Eisenlohr-Moul TA, Burris JL, Evans DR. Pain Acceptance, Psychological Functioning, and Self-Regulatory Fatigue in Temporomandibular Disorder. Health Psychol. 2012 Oct 22. [Epub ahead of print] [Medline: [23088173](#)]

A growing body of evidence suggests that chronic pain patients suffer from chronic self-regulatory fatigue: difficulty controlling thoughts, emotions, and behaviour. Pain acceptance, which involves responding to pain and related experiences without attempts to control or avoid them (pain willingness), and pursuit of valued life activities regardless of pain (activity engagement) has been associated with various favorable outcomes in chronic pain patients, including better psychological functioning. The study presented by authors tested the hypotheses that pain acceptance is associated with less psychological distress,

higher psychological well-being, and reduced self-regulatory fatigue in temporomandibular disorder (TMD) patients, particularly for those with longer pain duration. Cross-sectional data were provided by 135 TMD patients during an initial evaluation at a university-based tertiary orofacial pain clinic. Results of hierarchical linear regression models indicated that, controlling for pain severity, pain willingness is associated with less psychological distress and lower self-regulatory fatigue, and activity engagement is associated with greater psychological well-being. Furthermore, the effect of pain willingness on

psychological distress was moderated by pain duration such that pain willingness was more strongly associated with less psychological distress in patients with longer pain duration; this moderating effect was fully mediated by self-regulatory fatigue. It was concluded that these findings suggest pain willingness may buffer against self-regulatory fatigue in those with longer pain duration, and such conservation of self-regulatory resources may protect against psychological symptoms. (PsycINFO Database Record (c) 2012 APA, all rights reserved).

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