Post-orthodontic chronic musculoskeletal pain improvement after local anesthetic injections in the trigeminal area. A case series

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Abstract

Introduction: Orthodontic treatment has been linked to chronic extraoral pain, including cervical spine and gonalgia pain, which are often refractory to traditional treatments such as pharmaceutical drugs or physiotherapy and have an impact on quality of life and functional capacity. Our clinical experience includes cases of cervical or knee pain whose onset coincided with the implementation of orthodontics.

Patient concerns and diagnoses: Six orthodontic patients (five women, one man) aged 15-48 years, suffering from chronic cervical spine or gonalgia pain. These individuals had a considerable reduction in their mental and physical well-being because of the chronic pain and experienced limitations in mobility due to high levels of discomfort, anxiety or depression associated with their pain.

Interventions and outcomes: Local anesthetic injections were administered at individual lesions and palpable points of tissue tension points of the oral mucosa and at the extraoral myofascial level, in accordance with the patient's clinical symptoms and medical history.

Conclusion: Favorable results were observed after injection of procaine 0.5% in all patients within the case report. Our aim was to motivate future studies to evaluate the effectiveness of local anesthetic injections for post-orthodontic musculoskeletal pain.

Key words: Chronic pain; local anesthetics; musculoskeletal pain, neural therapy, orthodontic.
Aim

This article shows favorable results observed after LA injection in six orthodontic patients with chronic cervical or knee pain refractory to different treatments. Completely pain-free at 6m control and improvement of other ANS related symptoms.

With the aim of:
- seeking the source of the pain
- Warning of OTD a stressor
- Warning of Fascial Tension as a stress keeper
- Motivate future studies

Introduction. Orthodontic pain

More than 90% of orthodontic patients suffer from "orthodontic pain" generated by brace activation.

OTD mobilization is achieved with prolonged force on the teeth through bone remodelling.

The trigeminal plays a central role in the transmission of this pain.
**Introduction**

- **Trigeminal-cervical complex**

  Network of nerves and associated structures that involve the spinal nucleus of the trigeminal and the afferents of upper cervical nerves (C1-C3).

  Integrates sensory information and motor responses between the head, face, and neck regions.

  Stimulation of the infraorbital evoked a response of the splenius and SCM muscles, innervated by the upper cervical nerves.

- **Mechanotransduction**

  Is a complex dynamic process that converts biomechanical stimuli into intracellular biochemical signals that induce tissue responses.

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*Shiratori Tusita LN, Fischer L. Chronic therapy-resistant neck pain in a fifty-year-old man. The role of partially impacted third molars. Case report and new pathophysiological insights. Complement Med Res. 2023 Jan 23*

**Introduction**

**OTD and Matrix**

The compression, traction, and deformation forces exerted by OTD can generate large mechanical load patterns that translate into biological responses in the Cytoskeleton and ECM of the tissues surrounding the teeth.

Increased cytokines and various metalloproteinases have been evidenced at sites of orthodontic compression and tension.

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**Fascial System, Myofibroblast**

Myofibroblast contraction can occur ELSEWHERE in the connective tissue in reaction to the application of minimal force.

Myofibroblasts do not require a large amount of force to temporarily deform the ECM.

The changes occur in a few μm/day with a CUMULATIVE EFFECT

The connective tissue contains sensory receptors that transmit pain when the tissue is stretched.
Introduction. Mechanism

Fascial tension transmission


Fascial System and Adhesions

The fascial continuum is innervated by the sympathetic

Persistent tension of the fascia can lead to adhesions or scar tissue that impacts surrounding tissues: muscles, joints, vessels, nerves, etc.

These adhesions do not show up on radiological or other tests.

We have to palpate it
Fascial System. Tensegrity


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Fibrous tracts of dura mater crossing the skull. Tutusaus, 2015

Fascial System and Transmission

Terapia Neural

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Spinal Fascia
Spiral Fascia
Dorsal Superficial Fascia
Ventral Superficial Fascia
Method

- Detailed anamnesis
- Palpation of the tension in the patient’s body, including the intraoral cavity.
- Often coincides with a painful sensation.

Intervention and Monitoring

- Oral (submucosal) tension points: 0.5 mL
- Extraoral (myofascial) tension points: 1 mL
- Infraorbital and mental nerves intraorally injected.
- Num. of sessions for long-term remission: **3.2** (1-7)
- Patients returned if pain persisted or reappeared.
- Telephone monitoring at 3 and 6 months.
Neural Therapy and Orthodontics

Intervention

Woman, 47 years old
**Cervical pain for the last 10 years.**
- Worsening since OTD 5y ago (VAS 7/10)
- Anxiety coinciding with the brace’s onset.

**Medical:** Caesarean; hysterectomy 2y ago.
**Dental:** Fixed retainers for 5y
**Physical exam:** Limitation of cervical range of motion. Tension and dysesthesia in Pfannenstiel scar.

**Treatment and evolution:**
- Immediate cervical pain relief (VAS 3) and increased range of motion in the neck after injecting the oral TP.
- 2 more interventions by injecting into the myofascial TP of TMJ, subocc., trapezius, and Pfannenstiel scar.

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Intervention

Woman 15y.
**4 years knee pain** (VAS 7-8) coinciding with menarche and fixed OTD. Abandoned figure skating because of pain at 13, she had done since she was 6. Worsening with physical activity and menstruation.

**Medical:** Headache, otitis, constipation
**Dental:** Fixed OTD (11-13y); 18/28 in tilted orientation
**Physical exam:** Tension in oral, temporal, subocc., and abd areas.

**Treatment and evolution:**
- Immediate release of knee pain and abd. tension after injecting into oral vestibules and temporal TP.
- Also, abdominal TP were injected.
- After 3 sessions, absence of pain and headache, and improved anxiety went back to figure skating.
Results

Number of sessions and pain evolution

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Baseline | Immediate after NT | 2nd Session | 3rd Session | 4th Session | 5th Session | Last | Control |

Conclusions

Based on our experience,

Injection of low doses of LA into oral and myofascial stress points can release or eliminate chronic musculoskeletal pain that has worsened or started after OTD treatment.

Other symptoms related to decreasing the sympathetic, such as anxiety, may also improve.

We are acting on a causal factor, with a short-term stimulus but long-lasting by activating the self-organizing circuits.

This is a low cost and safe and fast treatment.
Where are we now

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PENDING APPROVAL

RANDOMIZED CLINICAL TRIAL OF LOW INTERVENTION WITH MYOFASCIAL INJECTIONS OF LOCAL ANESTHETIC FOR THE TREATMENT OF MUSCULOSKELETAL PAIN IN ORTHODONTIC PATIENTS

Simple blind (patient)
Multicentric
N = 90
3 groups (procaine, saline and sham injection)

Bibliography

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