CASE REPORT 2

Chronic Orofacial Pain- A diagnostic dilemma

SUHAIB ALQUDAH
DOCTOR OF CLINICAL DENTISTRY - ORAL MEDICINE
THE UNIVERSITY OF MELBOURNE
NOVEMBER 2019

Abstract

Chronic orofacial pain is a debilitating and disabling condition. It can cause significant disturbance to patients' everyday activity, sleep quality, social interaction, psychological wellbeing, and their quality of life in general. Moreover, chronic pain carries a considerable burden on patients' socioeconomic status and general population workforce due to loss of activity, absence from work, and increased load on healthcare system.

Introduction

The definition of chronic pain is variable, it can be defined as "pain that lasts beyond the normal physiological healing time". However, this definition can't be utilized in cases of chronic pain when pain is the only clinical symptom without clinically evident tissue damage or functional impairment. A more accurate definition has been recently suggested in *International Classification of Diseases (ICD-11)*; " chronic pain is pain that lasts or recurs for longer than 3 months" [(1)]. It has been estimated that chronic pain is prevalent in up to 31% of the studied cohort with a slight female predilection [(2)]. Many patients may present with more than one pain diagnosis and there may be an underlying psychiatric or personality disorder that predisposes to chronic pain, alters the presentation, and significantly affect management. In one study, chronic orofacial pain patients were treated in nine different hospital settings and were referred to 15 distinct specialties, with only 24% success of treatment [(3)]. In a UK based study, 7% of patients reported having a chronic orofacial pain, and 15% reported chronic widespread pain [(4)]. Plesh et al. found that 59% of patients with Temporomandibular Disorder (TMD) reported two or more comorbid pain conditions such as headache, migraine, neck pain, and lower back pain [(5)].

TMD is the most common cause of facial pain and the second most common cause of musculoskeletal pain after chronic low back pain. Its estimated prevalence is 5%-12%, with annual incidence of 3.9%. TMD has a female predilection of 2:1, with the most common age of presentation between 20-40 years. In adolescents, 4.2% of the studied population reported TMD pain [(6-9)].

TMD is a general term used to describe pain and/or dysfunction affecting masticatory muscle system, the temporomandibular joints (TMJs) and associated structures, or both. It is most commonly manifested as pain in the face and preauricular area, limitations in mandibular range

of motion, or noises from the TMJs during jaw function such as chewing, yawning, or talking [8]. Each of these symptoms can occur singularly or in association with each other. Headache can be the only symptom in almost one quarter of TMD patients [7]. The quality of painful symptoms is described most frequently in terms of an ache, soreness, or tenderness. While stiffness or fatigue are the most common non-painful jaw symptoms. The pain can be intermittent or persistent and is generally of moderate intensity. Nonetheless, periods of acute exacerbations or severe episodes of pain are not uncommon [10].

The etiopathogenesis of TMD is best represented in a multidimensional model of a biopsychosocial condition with peripheral and central factors. This include trauma, occlusion, parafunction, sex hormones and genetics, comorbid pain conditions, sleep disturbance, and psychological distress. Combination of these factors may lead to an increase in inflammatory mediators resulting in excitement and sensitization of peripheral sensory afferents. This sustained peripheral loading and nociceptive input from painful TMJs lead to a prolonged central sensitisation which in turn leads to development of referred pain and generalized pain sensitivity in TMD patients [11, 12].

Trigeminal neuralgia (TN) is a chronic neuropathic pain characterised by episodic unilateral, severe, sharp, stabbing, shooting, or electric shock like pain limited to the distribution of one or more divisions of the trigeminal nerve. The pain is of very short duration (10 seconds to 2 minutes), with abrupt onset, typically provoked by innocuous stimuli, such as touch, light wind, eating and talking. The International Classification of Headache Disorders, 3rd edition (ICHD-3) lists TN under the category *13. Painful lesions of the cranial nerves and other facial pain*, and subclassifies it as *classical, secondary, and idiopathic* based on the diagnostic criteria set in *Table 1* [13]. TN pain is strictly distributed over one or two divisions of the trigeminal nerve, more commonly maxillary and mandibular branches, and rarely the ophthalmic branch. The condition is more common in women with age range from 50-60 years, and an estimated lifetime prevalence of 0.3% [14-16]. TN can be of pure paroxysmal nature or there may be concomitant continuous pain of moderate intensity within the distribution of the affected nerve division. Some patients may experience refractory period of variable duration, where a second pain attack can't be provoked. Patients may have periods of remission that varies from months to years. In some patients, painful attacks may worsen with time or become medically refractory with significant impact on the equality of life [14, 15, 17].

Case report

A 68-year old lady was referred to the Oral Medicine Department of the Royal Dental Hospital of Melbourne, with a complaint of right hand side facial pain triggered by touching the face, clicking sound and pain over bilateral TMJ area which had started approximately 7 months ago at around the same time her son moved interstate for university study. Since then, the pain has been getting worse. Patient had also complained of nocturnal grinding and she thought her bite was not right.

Her medical history was relevant for high blood pressure controlled with medication, anxiety, dyslipidaemia, oesophageal reflux, and vitamin D deficiency. She takes Natrilix 1.5mg, Coveram 10mg/5mg, Omeprazole 20mg, Crestor 40mg, Caltrate, Panadine forte PRN, and Valium 5mg in the morning.

Patient reported sharp, short lasting pain in the right body of mandible that travelled towards the right ear with no specific trigger. Sometimes, pain can be exacerbated by eating and talking. The pain can happen upon waking up in the morning but may occur at any time during the day and had no specific pattern. For the previous three months, patient was using a flat plane maxillary splint most of the time (day and night) without any success in reducing her pain. Patient thought her pain was related to the extensive implant work she had 7 years ago; and therefore, she saw a periodontist who undertook cleaning and reassured her that the implants were in a good condition and that they were non-contributary to her pain symptoms.

The extra-oral examination was within normal limits, there was no regional lymphadenopathy, swelling, or asymmetry. There was no tenderness or reported familiar pain upon palpation and function of the TMJ's and muscles of mastication. There were no joint noises, restricted mandibular range of motion, or deviation upon opening. All trigeminal reflexes were normal.

Intraorally, patient had good oral hygiene, and no obvious odontogenic or mucosal pathology. Periodontal status was healthy with no abnormal pocketing or bleeding. The mouth was heavily restored, and radiographic assessment with orthopantomogram (OPG) and periapical radiographs *(Fig.1)* revealed; 8 implants that appeared short with heavy loading and possible violation of the periodontal ligament space of adjacent teeth, suboptimal endodontic treatment was noted in teeth 15,14,41,42, there was questionable periapical status for teeth 14,13, 42,43, and inability to ascertain vitality of teeth 13,43 as they were crowned . OPG did not show any evidence of osseous pathology involving TMJ's, maxilla, or mandible. Due to the non-specific symptoms at initial presentation, complexity of findings and the need for further assessment, a

definitive diagnosis could not be reached. Our provisional diagnoses were that of *1) Self-reported Sleep Bruxism (possible Sleep Bruxism), 2) Possible TMD in the form of myofascial pain with referral of moderate intensity*, and we had a very low suspicion of *3) Painful post-traumatic trigeminal neuropathy (PTTN)*. PTTN could not be ascertained due to lack of information about timing and site of the last dental procedure and the length of duration of approximately 7 years since the extensive implant work.

Patient was informed about the findings, reassured about the absence of obvious pathology, educated and counselled about possible diagnoses and their benign nature. Jaw rest program was provided, and patient was advised to switch her morning Valium of 5mg to night-time to help improve her sleep. Patient was keen on trailing physiotherapy as she reported mild neck pain, so she was referred accordingly. Patient was advised to stop using her current maxillary splint and to bring it in next review to be assessed. Patient was referred to endodontics department for assessment of pulpal and periapical statuses of teeth and to prosthodontics department to assess her implants. Patient was booked for a review in 6 weeks.

In the second review, patient had seen her general doctor for persistence of pain, who referred her to a neurologist for a review of suspected neuropathic pain and was placed on pregabalin 75mg twice daily. During that time, patient was also seen by physiotherapist. At the time of the review, we did not have details from the neurologist regarding diagnosis or management plan. Patient reported mild improvement in her pain level, it was less radiating and more localised to quadrant 4 teeth. Pain was not related to specific trigger; however, two painful episodes of sharp short-lasting pain were observed when patient was talking during the consultation. Patient brought in her old splint which was poorly designed and non-balanced with rough surface. Our diagnoses at this stage were reconsidered to *possible bruxism, possible TMD and possible trigeminal neuralgia*, due to the fact that patient was under neurologist management and that we have not received any communication in that regard, we've decided to continue managing TMD and bruxism as planned initially. Upper and lower alginate impressions were taken to fabricate upper flat plane occlusal splint and patient was booked for a review in 6 weeks.

In her third review, patient was experiencing less pain, her symptoms were typical for TN and fulfilled the diagnostic criteria *(Table 1)*. There was identifiable trigger of toothbrushing and chewing on the right-hand side mandibular teeth. Patient was still on 75mg Lyrica and her pain symptoms were moderately manageable. Therefore, upper splint was inserted to remove the

possible confounding factor of TMD, and patient was booked for a fourth review in one month. When patient returned later, she was completely asymptomatic, she had brain MRI undertaken via her neurologist and this did not show any vascular compression or intracranial pathology. Patient appreciated two types of pain (jaw pain and nerve pain) and she mentioned that her splint was of great help, and she had been using it nocturnally. Three months later patient returned for her 5th review, where she mentioned about a relapse in her TN symptoms for which she saw her neurologist who increased her pregabalin dose to 600mg resulting in significant side effects, this was ceased and patient had 40 U of botulinum toxin type A injected over the distribution of the right V3. The injection was given to her by her neurologist two weeks before her review with us, this had resulted in reduction in frequency of pain attacks, but the intensity did not change, patient developed facial muscle weakness which eventually resolved in 4 weeks. Her TMD symptoms were under control and she was booked for a review in 4 weeks to monitor her symptoms.

Patient did not attend her follow up appointments until a year later, by that time, she had endodontics assessment which ruled out odontogenic pain. She was taking 600mg gabapentin three times daily and that was of a little help. She reported pain episodes every time she brushed her teeth or chew on the right-hand side. She mentioned that her TMD symptoms have completely resolved and that she did not need to use the splint for the last 3 months. After requesting her detailed history form her GP and neurologist, there was no trial of carbamazepine and there was no reason to contraindicate the use of this medicine as a first line medication for TN. Consequently, patient was advised to trial Tegretol 100mg twice daily and to increase this by 100mg every 3 days monitoring symptoms and side effects and maintaining minimum effective dose. Gabapentin to be tapered down at the same time. A detailed letter was sent to GP to monitor treatment response, side effects and perform baseline laboratory tests. A week later, patient contacted the clinic, she was on 200mg night, 100mg morning dose of carbamazepine, and on 1200mg gabapentin. She reported significant improvement in her symptoms, she was able to brush and eat without pain, and she continued with her GP for further titration of her dosage and monitoring. She is booked for a review in 3 months' time.

Discussion

It is not uncommon for patients to present with multiple pain conditions affecting the orofacial structures at the same time, with overlapping clinical signs and pain symptoms. This could complicate the decision making about the exact diagnosis and management. Cases of TN can be easily misdiagnosed as TMD especially if the TMD is unilateral and as it is a far more common condition [17]. Diagnosis of TMD requires history and clinical confirmation of familiar pain affecting the masticatory system, joint noises and/or jaw functional limitation within the last 30 days preceding the clinical examination as detailed in DC/TMD, and the most common diagnoses are pain related -myalgia and arthralgia [8, 18].

It is well-recognised now that TMD is a multifactorial condition with interaction between multiple factors such as physical signs and symptoms (peripheral aspect), leading to changes in behaviours, emotional status, and social interactions as manifestations of general central nervous system dysregulation (central aspect) in a bidirectional way (Biopsychosocial model) [12]. Therefore, management should be multidimensional and directed to cover different aspects of the disease. Conservative reversible therapies are the treatment of choice in the majority of patients with TMD this include; behavioural therapies such as education and counselling, biofeedback, cognitive behavioural therapy (CBT), habit reversal, self-treatment at home after instruction, and relaxation techniques [19]. Physical conservative management/ jaw rest through soft diet, muscle relaxation and stress reduction, interocclusal splint, physiotherapy, moist heat, and acupuncture have been shown to be effective [20-22]. Pharmacotherapy can be effective in acute cases of TMD , while surgical options are reserved for cases with moderate to severe pain and dysfunction or degenerative joint disease that are non-responsive to conservative management [23].

Diagnosis of TN must be established clinically by fulfilling the diagnostic criteria *(Table 1)*. MRI imaging is required to rule out possible underlying pathology and confirm sub-diagnosis [13]. First line management of TN is sodium channel blockers (carbamazepine or oxcarbazepine), which have been shown to be effective in almost all patients with a number needed to treat of 1.4-1.7. Treatment failure has been largely attributed to the inability to tolerate side effects rather than the medication itself being ineffective. Main side effects include somnolence, drowsiness, dizziness, rash, and tremor. Other rare but serious side effects include hepatic disturbance; blurred vision; GI upset; blood dyscrasia; urticaria; allergic dermatitis; hypersensitivity including severe cutaneous adverse reaction (SCAR) [15, 24, 25]. Other medications such as lamotrigine, gabapentin, botulinum toxin type A, pregabalin, baclofen and phenytoin may be used either as monotherapy or add-on therapy when first-line drugs fail due

to either inefficacy or tolerability. Surgical options are reserved for medically refractory cases. Where MRI evidence of neurovascular compression is present, microvascular decompression is preferred with more predictable outcome of long term pain relief compared to other neuro-ablative surgical procedures [24-29].

Botulinum toxin type A (BTX-A) blocks the TRPV1 receptor of unmyelinated C fibres and limits the release of nociceptive neuropeptides from presynaptic terminals of the primary sensory neurons [27]. BTX-A was shown to reduce paroxysms frequency per day and provide significant pain relief compared to placebo. However, this was not without side effects such as facial drooping, oedema and haematoma at the site of injection and cost [24]. In their review, Cruccu et al. found six clinical trials with a total number of 81 patients who had BTX-A injections and reported 85% response rate, with 105 days of pain relief, and an efficacy similar to carbamazepine [27]. BTX-A was found to be effective and safe in treating patients of advanced age (≥80 years old), with 25% of patients remain pain free up to 14 months [30]. Börü et al., injected BTX-A to the maxillary and mandibular roots of 27 patients and claimed that 44% of patients did not experience any pain at the sixth-month review [31]. However, based on the low quality of evidence, the European Academy of Neurology guideline on trigeminal neuralgia has given a weak recommendation for BTX-A to be used as add-on therapy for medium-term treatment of TN [25].

A recent systematic review of clinical trials on the use of BTX-A in the management of myofascial pain and TN resulted in 7 and 9 trails respectively. In all studies, the treatment was well tolerated and resulted in pain reduction. However, the quality of these trials was poor and there was no objective assessment of the adverse outcomes. Therefore, a recommendation for the use of BTX-A in orofacial pain conditions cannot be given until further well designed good quality trials are available [32].

Unfortunately, and despite the international guidelines, carbamazepine as a first line management of TN was not used in our patient. Zakrzewska et al. reported that only 54% of TN patient had been prescribed carbamazepine and over 80% had already been to 1 specialist centre which had not provided appropriate management prior to the referral to orofacial pain clinic [33].

This case highlights the importance of clinical liaison and communication among healthcare providers involved in the management of chronic pain patients and the need for consistent detailed clinical information gathering and detailed history taking. I have endeavoured all

efforts to comprehensively review and undertake detailed pain history from the patient in every visit, communicate with patient's GP and neurologist, and provided management based on the best available evidence. This has resulted in a quick significant reduction of pain symptoms as reported by the patient.

References

1. Treede RD, Rief W, Barke A, Aziz Q, Bennett MI, Benoliel R, et al. A classification of chronic pain for ICD-11. Pain. 2015;156(6):1003-7.

2. Steingrímsdóttir ÓA, Landmark T, Macfarlane GJ, Nielsen CS. Defining chronic pain in epidemiological studies: a systematic review and meta-analysis. Pain. 2017;158(11):2092-107.
3. Beecroft EV, Durham J, Thomson P. Retrospective examination of the healthcare 'journey' of chronic orofacial pain patients referred to oral and maxillofacial surgery. Br Dent J. 2013;214(5):E12.
4. Aggarwal VR, McBeth J, Zakrzewska JM, Lunt M, Macfarlane GJ. The epidemiology of chronic syndromes that are frequently unexplained: do they have common associated factors? International journal of epidemiology. 2006;35(2):468-76.
5. Plesh O, Adams SH, Gansky SA. Temporomandibular joint and muscle disorder-type pain and comorbid pains in a national US sample. Journal of orofacial pain. 2011;25(3):190-8.
6. Research NIoDaC. Research Data & Statistics Facial Pain: National Institute of Dental and Craniofacial Research; 2019 [ ]. Available from: https://www.nidcr.nih.gov/research/data-statistics/facial-pain/prevalence.
7. Slade GD, Bair E, Greenspan JD, Dubner R, Fillingim RB, Diatchenko L, et al. Signs and symptoms of first-onset TMD and sociodemographic predictors of its development: the OPPERA prospective cohort study. The journal of pain : official journal of the American Pain Society. 2013;14(12 Suppl):T20-32.e1-3.
8. Schiffman E, Ohrbach R, Truelove E, Look J, Anderson G, Goulet JP, et al. Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) for Clinical and Research Applications: recommendations of the International RDC/TMD Consortium Network* and Orofacial Pain Special Interest Group†. Journal of oral & facial pain and headache. 2014;28(1):6-27.
9. Nilsson IM, List T, Drangsholt M. Prevalence of temporomandibular pain and subsequent dental treatment in Swedish adolescents. Journal of orofacial pain. 2005;19(2):144-50.
10. List T, Jensen RH. Temporomandibular disorders: Old ideas and new concepts. Cephalalgia. 2017;37(7):692-704.
11. Cairns BE. Pathophysiology of TMD pain--basic mechanisms and their implications for pharmacotherapy. J Oral Rehabil. 2010;37(6):391-410.
12. Suvinen TI, Reade PC, Kemppainen P, Kononen M, Dworkin SF. Review of aetiological concepts of temporomandibular pain disorders: towards a biopsychosocial model for integration of physical disorder factors with psychological and psychosocial illness impact factors. European journal of pain (London, England). 2005;9(6):613-33.
13. Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition. Cephalalgia. 2018;38(1):1-211.
14. Benoliel R, Sharav Y, Haviv Y, Almoznino G. Tic, Triggering, and Tearing: From CTN to SUNHA. Headache. 2017;57(6):997-1009.
15. Maarbjerg S, Stefano GD, Bendtsen L, Cruccu G. Trigeminal neuralgia – diagnosis and treatment. Cephalalgia. 2017;37(7):648-57.
16. Mueller D, Obermann M, Yoon MS, Poitz F, Hansen N, Slomke MA, et al. Prevalence of trigeminal neuralgia and persistent idiopathic facial pain: a population-based study. Cephalalgia. 2011;31(15):1542-8.
17. Zakrzewska JM. Multi-dimensionality of chronic pain of the oral cavity and face. The journal of headache and pain. 2013;14(1):37.
18. Ohrbach R, Dworkin SF. The Evolution of TMD Diagnosis: Past, Present, Future. J Dent Res. 2016;95(10):1093-101.
19. Aggarwal VR, Lovell K, Peters S, Javidi H, Joughin A, Goldthorpe J. Psychosocial interventions for the management of chronic orofacial pain. The Cochrane database of systematic reviews. 2011(11):Cd008456.
20. Gomes CA, Politti F, Andrade DV, de Sousa DF, Herpich CM, Dibai-Filho AV, et al. Effects of massage therapy and occlusal splint therapy on mandibular range of motion in individuals with temporomandibular disorder: a randomized clinical trial. Journal of manipulative and physiological therapeutics. 2014;37(3):164-9.
21. Klasser GD, Greene CS. Oral appliances in the management of temporomandibular disorders. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2009;107(2):212-23.
22. List T, Axelsson S. Management of TMD: evidence from systematic reviews and meta-analyses. Journal of oral rehabilitation. 2010;37(6):430-51.
23. Bouloux G, Koslin MG, Ness G, Shafer D. Temporomandibular Joint Surgery. Journal of Oral and Maxillofacial Surgery. 2017;75(8):e195-e223.
24. Di Stefano G, Truini A, Cruccu G. Current and Innovative Pharmacological Options to Treat Typical and Atypical Trigeminal Neuralgia. Drugs. 2018;78(14):1433-42.
25. Bendtsen L, Zakrzewska JM, Abbott J, Braschinsky M, Di Stefano G, Donnet A, et al. European Academy of Neurology guideline on trigeminal neuralgia. European journal of neurology. 2019;26(6):831-49.
26. Cruccu G, Gronseth G, Alksne J, Argoff C, Brainin M, Burchiel K, et al. AAN-EFNS guidelines on trigeminal neuralgia management. European journal of neurology. 2008;15(10):1013-28.

27. Cruccu G, Truini A. Refractory trigeminal neuralgia. Non-surgical treatment options. CNS drugs. 2013;27(2):91-6.
28. Di Stefano G, La Cesa S, Truini A, Cruccu G. Natural history and outcome of 200 outpatients with classical trigeminal neuralgia treated with carbamazepine or oxcarbazepine in a tertiary centre for neuropathic pain. The journal of headache and pain. 2014;15(1):34.
29. Inoue T, Hirai H, Shima A, Suzuki F, Yamaji M, Fukushima T, et al. Long-term outcomes of microvascular decompression and Gamma Knife surgery for trigeminal neuralgia: a retrospective comparison study. Acta Neurochir (Wien). 2017;159(11):2127-35.
30. Liu J, Xu Y-Y, Zhang Q-L, Luo W-F. Efficacy and Safety of Botulinum Toxin Type A in Treating Patients of Advanced Age with Idiopathic Trigeminal Neuralgia. Pain Research and Management. 2018;2018:5.
31. Türk Börü Ü, Duman A, Bölük C, Coşkun Duman S, Taşdemir M. Botulinum toxin in the treatment of trigeminal neuralgia: 6-Month follow-up. Medicine (Baltimore). 2017;96(39):e8133.
32. De la Torre Canales G, Poluha RL, Lora VM, Araujo Oliveira Ferreira DM, Stuginski-Barbosa J, Bonjardim LR, et al. Botulinum toxin type A applications for masticatory myofascial pain and trigeminal neuralgia: what is the evidence regarding adverse effects? Clin Oral Investig. 2019;23(9):3411-21.
33. Zakrzewska JM, Wu J, Mon-Williams M, Phillips N, Pavitt SH. Evaluating the impact of trigeminal neuralgia. Pain. 2017;158(6):1166-74.

Table 1 ICHD-3 Diagnostic criteria for TN (13):

A. Recurrent paroxysms of unilateral facial pain in the distribution(s) of one or more divisions of the trigeminal nerve, with no radiation beyond, and fulfilling criteria B and C

B. Pain has all of the following characteristics:

1. lasting from a fraction of a second to two minutes
2. severe intensity
3. electric shock-like, shooting, stabbing or sharp in quality

C. Precipitated by innocuous stimuli within the affected trigeminal distribution

D. Not better accounted for by another ICHD-3 diagnosis.

---

1. For classical TN, demonstration on MRI or during surgery of neurovascular compression (not simply contact), with morphological changes in the trigeminal nerve root, in addition to the diagnostic criteria is required.

2. For secondary TN, in addition to the above criteria,

A. An underlying disease has been demonstrated known that is to be able to cause, and explaining, the neuralgia

B. Not better accounted for by another ICHD-3 diagnosis.

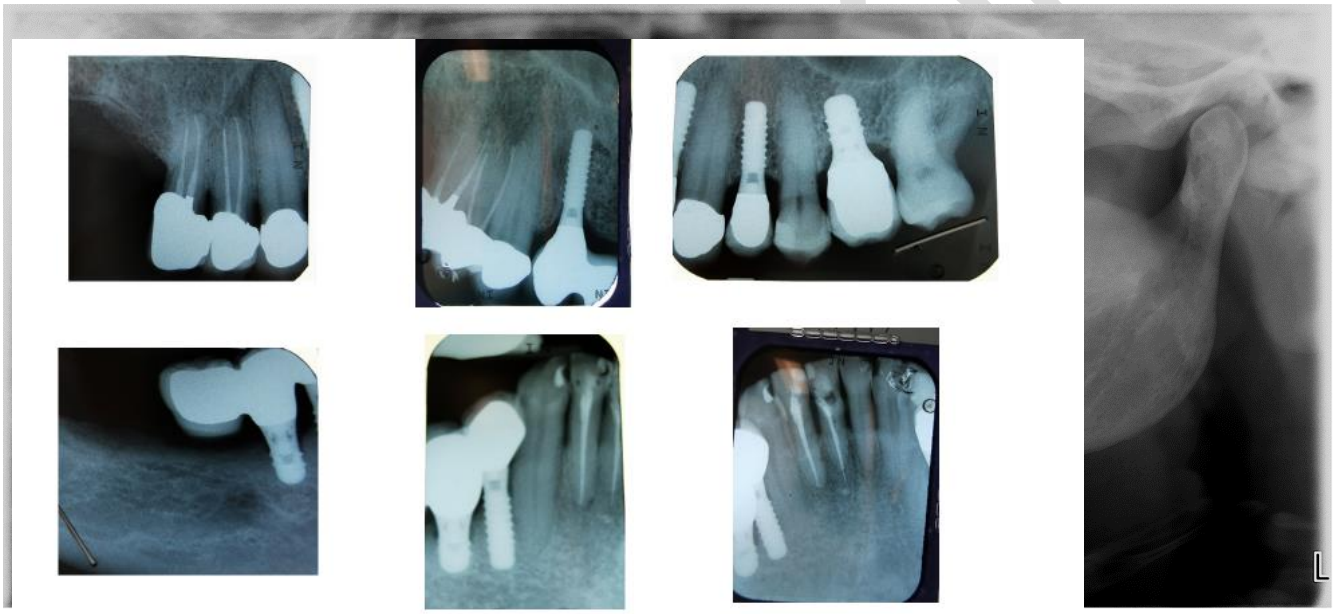

Figure 1. Orthopantomogram and periapical survey, showing the extensive dental work previously done.