CASE REPORT

Management of post-treatment exacerbated temporomandibular disorder

Satheesh B Haralur, Ebrahim Fihaid Alsubaiy

Department of Prosthodontics,
College of Dentistry, King
Khalid University, Abha, Assir,
Saudi Arabia

Correspondence to

Dr Satheesh B Haralur,
hb_satheesh@yahoo.com

SUMMARY

The patient returning to the clinic with a restricted mouth opening after dental treatment is common in dental practice. An extended, wide mouth opening during the dental treatment is known to exacerbate the underlying temporomandibular disorders (TMDs). Subclinical TMD is prevalent among a large number of people in the society. It is advisable in the interest of patients as well as the treating dentist for routine examination of temporomandibular joint and recording TMD history before initiating dental treatment. Adequate knowledge and skill of the dentist is required to identify the causative factors and initiate appropriate treatment. This case report explains the stabilising occlusal splint therapy to treat the restricted mouth opening in chronic centrally mediated myalgia flared up due to extended dental treatment.

BACKGROUND

A healthy masticatory system is important for the physical and psychological health of an individual. It plays an important role in breathing, swallowing, speaking and mastication. The stomatognathic system consists of temporomandibular joint (TMJ), muscles of mastication and teeth, and these are controlled and coordinated by the central nervous system. Temporomandibular disorders (TMDs) are a collective term used for the masticatory system, clinical problems of joint and muscle of mastication. Aetiology of TMD is multifactorial; the majority of authors consider occlusal interferences to be an important initiating factor.¹⁻³ Other aetiological factors include malocclusion with large skeletal discrepancies,^{4 5} parafunctional habits⁶ and missing posterior teeth.⁷ When the condyles are in their most superioanterior position in the articular fossae, seated on the posterior slopes of articular eminences is known as musculoskelatally stable (MS) position. This orthopaedically stable joint position in centric relation results in a harmonious masticatory function with least stress on muscles and joints.⁸ Axial loading and simultaneous contact of all posterior teeth are important ingredients of the MS position of the joint. The occlusal contact pattern strongly influence joint stability; occlusal interference during closing and lateral movements sends improper neuromuscular feedback, this leads to muscle bracing of the joint.⁹ Existence of proper anterior guidance and canine guidance has been shown to inhibit muscle activity.¹⁰ The micro-trauma resulted from the unstable mandible led to the elongation of the discal ligament and thinning of the disc. Post-treatment TMD and restricted

mouth opening are common complications in dental practice. A prolonged, extensive mouth opening for dental procedures is known to recur or initiate TMD. Hence, it is important for the dentist to be aware of the preventive measures to avoid TMD recurrence and identify the clinical signs and symptoms indicating the underlying subclinical TMDs. Hence, this case report is important for the dentist to be aware of disadvantages of prolonged dental procedures in subclinical patients with TMD and methods to identify and manage the masticatory muscular disorders.

CASE PRESENTATION

A 35-year-old female patient visited King Khalid University dental clinics reporting of limited mouth opening from last 3 weeks and pain on the right-side of the face. The patient provided the history of initiation of symptoms immediately after undergoing difficult, prolonged extraction of the mandibular first molar on the left side. She also reported the episode of restricted mouth opening and TMJ clinking, which was resolved after conservative treatment approximately 2 years before.

Clinical examination revealed that the left and right lateral pterygoid muscles were tender on palpation (Score 2). Moderate pain (Score 2) was also observed in the masseter muscle on the right side. The maximum comfortable opening at the inter-incisal distance was 16 mm (figure 1) and an attempt to open the mouth wider elicited severe pain and discomfort. TMJ examination was negative for pain and clicking. Nothing significantly abnormal was found at TMJ on panoramic radiograph. Intraoral examination showed mandibular first molar on both sides were missing. There was mesial drifting of the second molar on the right side. The patient had habitual anteriorly positioned mandibular centric relation (figure 2). Mandibular

Figure 1 Patient with a limited mouth opening.

To cite: Haralur SB, Alsubaiy EF. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-009836

Figure 2 Habitual forward position of the mandible.

eccentric movements were also significantly reduced. There was centric forward slide more than 2 mm from centric relation to centric occlusion. Protrusive and balancing interferences were observed in molars on both sides. The soft-end feel was observed on an attempt to increase the mouth opening by steady force between incisors. After carefully evaluating the clinical signs and symptoms, in addition to clinical examination, it was diagnosed as chronic centrally mediated myalgia secondary to centric, eccentric occlusal interferences and loss of vertical support due to extraction of posterior teeth. The subclinical TMD was exacerbated due to the prolonged, extensive opening of the mouth during extraction.

TREATMENT

The patient was explained in detail about the treatment plan, benefits, limitation and the importance of her active participation before informed consent was obtained. The patient was made to understand the existence of subclinical TMD and informed about her unstable occlusal condition. Treatment plan included the combination of physical self-regulation (PSR) and stabilisation occlusion splint therapy. It was decided to provide the stabilisation appliance on the maxillary arch. Alginate impression of maxillary as well as mandibular arch impression was made. Centric relation was recorded by the Dawson's bi-manual method along with a face bow record. Dental casts were mounted on a semiadjustable articulator with the help of an inter-occlusal record and a face bow. The 2 mm thick stabilising occlusal appliance was made with self-cure clear acrylic resin

(figure 3). The extension of the occlusal appliance was limited to the middle and the gingival one-third junction of the teeth on the labial surface and on the palatal side it was extended up to 12–15 mm. The appliance was tried on the patient for its stability. Ideal posterior centric contacts and anterior spots were established in the patient's mouth with acrylic resin. After establishing MS posterior contacts, canine ramp was made between maxillary canines. Canine ramp was helpful in disengagement of posterior teeth during protrusive and lateral movements (figure 4). The patient was advised to wear the appliance in the night-time and during day time she was advised to keep the teeth out of contact.

OUTCOME AND FOLLOW-UP

She was provided with the instruction on PSR techniques and advised for passive stretching for maximum mandibular opening after 2 weeks. The patient was scheduled for regular follow-up for evaluation and correction of occlusal splint for 6 weeks. The maximum comfortable mouth opening was regained to 31 mm at the end of 6 weeks (figure 5), and mandibular eccentric movements were also restored. The patient was advised to replace the missing both posterior mandibular teeth and refining occlusal interference for long-term stabilisation of occlusion and healthy TMJ.

DISCUSSION

Patients reporting of temporomandibular symptoms after prolonged dental treatment are a common phenomenon.¹¹ The dentist should have a routine cursory TMJ examination to diagnose low-level subclinical TMD before initiating any dental procedure to protect himself against future medicolegal complication. It is in the interest of the patient as well as the dentist to enquire about the history of TMD symptoms, complete evaluation of muscles of the mastication and TMJ for pain and dysfunction. He should also take a requisite precaution to avoid underlying TMD flare up. Restricted mouth opening is observed in disorders of muscle of mastication as well as TMJ. History and clinical examination will enable the dentist to reach proper diagnosis, in turn help him in initiating required treatment. Dental literature is divided on the issue of role of the occlusal interference on the initiation of TMD. While some researchers dispute the role of occlusal interference in TMD initiation,¹² the majority of researchers agree on the importance of the MS mandibular position for the healthy masticatory system. The occlusal interferences identified to have a substantial

Figure 3 Stabilising appliance in the patient mouth.

Figure 4 Re-established canine guidance.

Figure 5 Picture showing regained normal opening.

influence on TMD initiations are centric slide more than 2 mm,¹³ balancing side interferences and protrusive interferences,^{2,3} Loss of stable vertical support due to multiple missing posterior teeth is also considered as an important factor in TMD initiation.¹⁴ Contraction of elevator muscles while mandible in the orthopaedically stable position is well tolerated by joint and dentition. Unstable condyle position during force loading leads to disc thinning and discal ligament elongation. Loss of teeth leads to drifting, tilting and supra eruption of teeth. Poor arch integrity usually results in centric and eccentric occlusal interferences.

Significant functional disturbances results due to the presence of protrusive interference, laterotrusive and mediotrusive contacts, these undesirable contacts are detrimental to the health of the masticatory system. These interferences were identified as damaging contact by neuromuscular system, muscle engrams are developed to disengage these contacts. Muscular disorders also brings about acute malocclusion; the lateral pterygoid muscle spasm due to persistent, chronic occlusal interferences pulls the condyle medially and anteriorly leads to posterior disocclusion on the ipsilateral side.^{15,16} Electromyogram studies have revealed that there is less muscle activity in case of canine guidance occlusion.¹⁷ Hence, a reversible occlusal splint with proper static and dynamic occlusal contact is advised to eliminate the muscle hyperactivity and spasm.¹⁸

The stabilising occlusal appliance is advised to treat the muscular disorders. It is beneficial for local muscle soreness as well as chronic centrally mediated myalgia. The goal of stabilising the splint is to place the mandible in the MS position with simultaneous, even contact of posterior teeth. Inclusion of canine ramp disoccludes all the posterior teeth during eccentric movement. The appliance re-establishes orthopaedic stability and helps the muscle to regain the optimum functional activity.^{19,20}

PSR techniques are also helpful adjunct for the occlusal splint during treatment of masticatory muscle disorders.²¹ The patient is educated about the proper PSR techniques. Recovery from the muscular disorder should be followed by permanent re-establishment of harmonious occlusion. This includes orthodontic correction of tilted, drifted teeth and replacement of missing teeth. The healthy TMJ and dentition will affect the quality of life of the patient as a whole. Hence, the dentist should take utmost care while treating a patient not to initiate or recur, flare up low-lying TMD. The patient should be given sufficient rest during treatment, and excessive opening of mouth for prolonged time needs to be discouraged.

Learning points

- ▶ It is advisable for the dentist to record the temporomandibular disorders (TMD) history and mandatory temporomandibular joint examination before initiating any dental treatment. Extensive, prolonged treatment is known to cause flare-up of subclinical TMD and protective muscle cocontraction. Hence, the dentist should give sufficient rest to the patient to avoid this eventuality.
- ▶ Accurate diagnosis to differentiate between intracapsular disorder and muscular disorder is critical to initiate the appropriate treatment.
- ▶ Routine occlusal evaluation will be helpful to educate the patient about existing occlusal conditions and to initiate the preventive measures for temporomandibular disorders.

Contributors SB and EA were involved in the diagnosis, treatment plan, execution of treatment and write-up. AE assisted during treatment execution.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Raustia AM, Pirttinen PM, Pyhtinen J. Correlation of occlusal factors and condyle position asymmetry with signs and symptoms of temporomandibular disorders in young adults. *Cranio* 1995;13:152–6.
- 2 Shiau YY, Chang C. An epidemiological study of temporomandibular disorders in university students of Taiwan. *Community Dent Oral Epidemiol* 1992;20:43–7.
- 3 Lobbezoo-Scholte AM, De Leeuw JR, Steenks MH, et al. Diagnostic subgroups of craniomandibular disorders. Part I: Self-report data and clinical findings. *J Orofac Pain* 1995;9:24–36.
- 4 al-Hadi LA. Prevalence of temporomandibular disorders in relation to some occlusal parameters. *J Prosthet Dent* 1993;70:345–50.
- 5 Olsson M, Lindqvist B. Mandibular function before and after orthodontic treatment. *Eur J Orthod* 1995;17:205–14.
- 6 Manfredini D, Lobbezoo F. Relationship between bruxism and temporomandibular disorders: a systematic review of literature from 1998 to 2008. *Oral Surg, Oral Med, Oral Pathol, Oral Radiol Endod* 2010;109:e26–50.
- 7 Seligman DA, Pullinger AG. A multiple stepwise logistic regression analysis of trauma history and 16 other history and dental cofactors in females with temporomandibular disorders. *J Orofac Pain* 1996;10:351–61.
- 8 The glossary of prosthodontic terms. *J Prosthet Dent* 2005;94:10–92.
- 9 Ciancaglini R, Gherlone EF, Radaelli G. Association between loss of occlusal support and symptoms of functional disturbances of the masticatory system. *J Oral Rehabil* 1999;26:248–53.
- 10 Williamson EH, Lundquist DO. Anterior guidance: its effect on electromyographic activity of the temporal and masseter muscles. *J Prosthet Dent* 1983;49:816–23.
- 11 Dhanrajani PJ, Jonaidei O. Trismus: aetiology, differential diagnosis and treatment. *Dent Update* 2002;29:88–92.
- 12 Conti PC, Ferreira PM, Pegoraro LF, et al. A cross-sectional study of prevalence and etiology of signs and symptoms of temporomandibular disorders in high school and university students. *J Orofac Pain* 1996;10:254–62.
- 13 Westling L. Occlusal interferences in retruded contact position and temporomandibular joint sounds. *J Oral Rehabil* 1995;22:601–6.
- 14 Tallents RH, Macher DJ, Kyrkanides S, et al. Prevalence of missing posterior teeth and intraarticular temporomandibular disorders. *J Prosthet Dent* 2002;87:45–50.
- 15 Magnusson T, Enbom L. Signs and symptoms of mandibular dysfunction after introduction of experimental balancing-side interferences. *Acta Odontol Scand* 1984;42:129–35.
- 16 Dupont JS. Acute malocclusion. *Gen Dent* 2006;54:102–4.
- 17 Akoren AC, Karaagaciloglu L. Comparison of the electromyographic activity of individuals with canine guidance and group function occlusion. *J Oral Rehabil* 1995;22:73–7.
- 18 Hagag G, Yoshida K, Miura H. Occlusion, prosthodontic treatment, and temporomandibular disorders: a review. *J Med Dent Sci* 2000;47:61–6.
- 19 Okeson JP, Kemper JT, Moody PM. A study of the use of occlusion splints in the treatment of acute and chronic patients with craniomandibular disorders. *J Prosthet Dent* 1982;48:708–12.

- 20 Ekberg E, Vallon D, Nilner M. The efficacy of appliance therapy in patients with temporomandibular disorders of mainly myogenous origin. A randomized, controlled, short-term trial. *J Orofac Pain* 2003;17:133–9.
- 21 Carlson CR, Bertrand PM, Ehrlich AD, *et al.* Physical self-regulation training for the management of temporomandibular disorders. *J Orofac Pain* 2001;15: 47–55.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow