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Coxalgia and Temporomandibular Disorders

CASE REPORT

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Abstract

Background: Although the occlusal equilibration in bite plate-induced occlusal position has been reported to be effective in resolving temporomandibular disorder (TMD)-related symptoms, it still remains unclear whether coxalgia is included in those TMD-related symptoms.

Method and Findings: Occlusal equilibration was performed for a TMD patient with coxalgia. First, painful symptoms were relieved by appliance therapy. Subsequently, occlusal analysis was performed on the patient by mounting dental models mounted on an articulator and identifying a deviation of the occlusal position from the bite plate-induced occlusal position (BPOP). Occlusal equilibration to the BPOP was performed for the patient by selective tooth grinding. On treatment completion, the occlusal position was shifted 1 mm forward on the left side and 1 mm backward on the right side from the previous habitual occlusal position. The TMD-related symptoms (temporomandibular joint clicking and pain) were resolved, and left coxalgia disappeared.

Conclusion: Coxalgia is thought to be included in TMD-related symptoms.

Keywords
Coxalgia; Temporomandibular Disorder.

Introduction

Various symptoms such as headache, tongue pain, burning mouth syndrome, and aural symptoms (tinnitus, vertigo and earache) have been classified as temporomandibular disorder (TMD)-related symptoms [1]. However, coxalgia has not been reported as a TMD-related symptom. It is unclear whether there is any relationship between TMD and coxalgia. A relationship between TMD and posture [2] and that between posture and gait movement disorders including temporomandibular joint disorders (TMJD) has been reported [3]. Therefore, it is important to investigate the relationship between TMDs and coxalgia.

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Case presentation

A 44-year-old woman presented with a chief complaint of severe pain and noise in the left temporomandibular joint (TMJ). She reported that she had not experienced these symptoms previously. She also complained about left coxalgia and lumbago. She reported that the coxalgia had been continued six months before. The patient's medical history was unremarkable. Mouth opening was adequate. However, the opening of the mouth deviated laterally to the right. The patient reported tenderness of the left TMJ and but not masticatory muscles on palpation. Her four first premolars were missing due to previous orthodontic treatment **(Figura 1** and **2)**. Dental occlusion was anatomically normal, except for cross-bite of the lower right lateral incisor **(Figure 3)**. The TMJs bilaterally appeared normal on the TMJ computed tomography images taken in the habitual occlusal position (HOP) at the first consultation **(Figure 4)**. Both hip joints also appeared normal **(Figure 5)**. A HOP record was obtained at the first visit, using a vinyl polysiloxane bite registration material (GC, Tokyo, Japan). The patient was seated in an upright position with her jaw voluntarily closed. An anterior flat bite plate was fabricated on the upper dental model using a self-curing acrylic resin (GC, Tokyo, Japan). The patient wore this every night for 3 days **(Figure 6)**. At the second visit (four days after the first visit), her left TMJ pain had ceased. The bite plate-induced occlusal position (BPOP) record was

Figure 1: Lower dental arch.

Figure 2: Upper dental arch.

Figure 3: Frontal view of the dental arches.

Figure 4: Bilateral tomographic image of the TMJ before treatment.

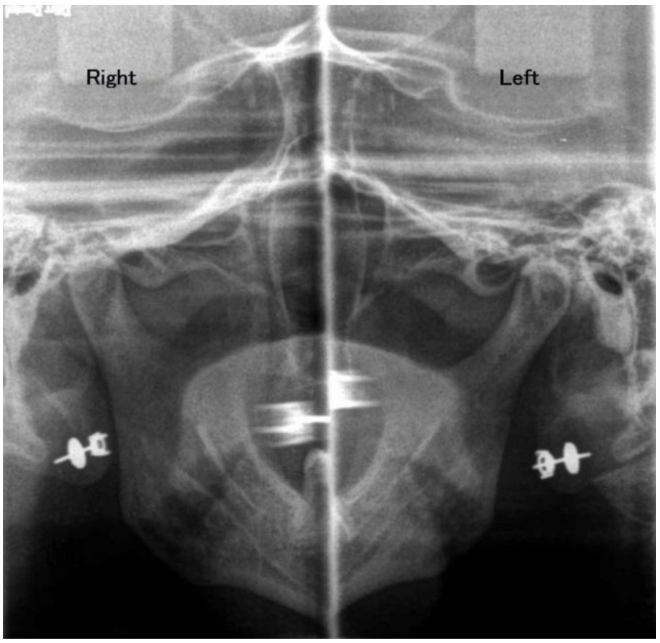


Figure 5: Roentgenogram of both coxa.

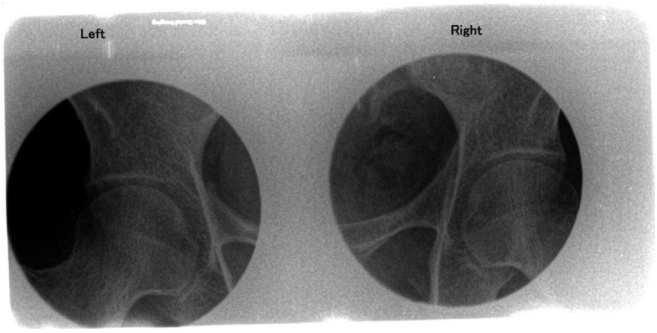


Figure 6: Wearing an anterior flat plane bite plate.

obtained after she wore the bite plate for 5 min, using the same material for the HOP recording. The patient was seated upright, with her jaw voluntarily closed. To examine the difference between HOP and BPOP, two-dimensional measurements were performed on the modified articulator using previous records **(Figure 7)**. Her mandible deviated 1 mm posterior on the left side and 1 mm anterior on the right side from BPOP (this is the physiological, muscular contact position). Occlusal adjustments

Figure 7: Mandibular position analyzer. The arrow indicates the shift from HOP to BPOP.

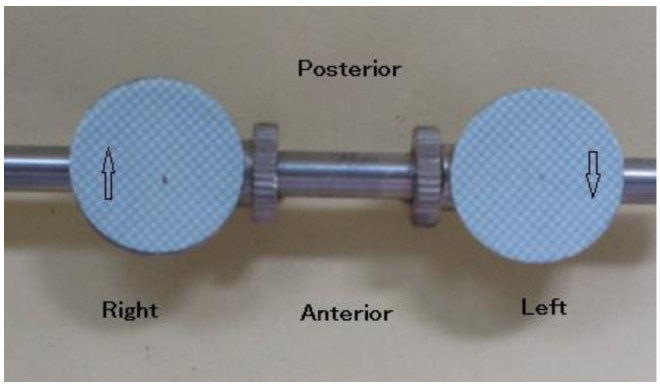
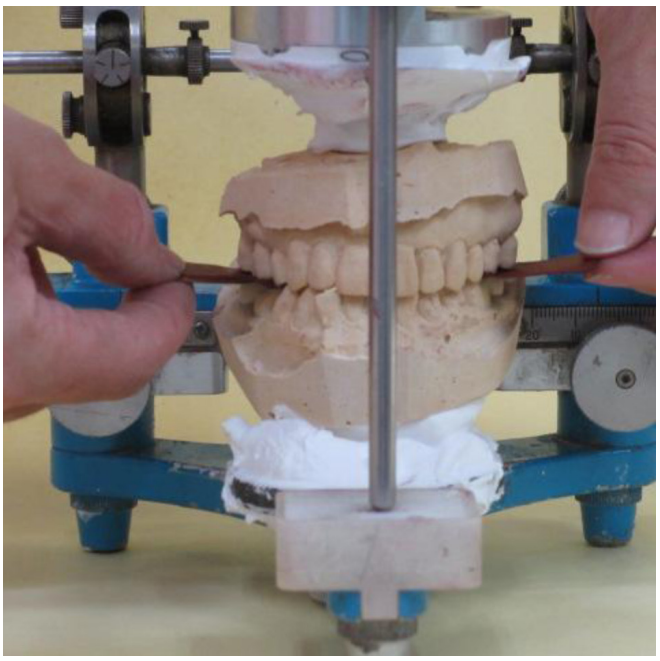


Figure 8: Areas in black indicate adjustment points.

Figure 9: Confirmation of occlusal contacts on both sides in the muscular contact position.



were performed on the dental models mounted on the articulator until 6 posterior teeth bilaterally made occlusal contacts **(Figure 8** and **9)**. Occlusal adjustments were then performed following the aforementioned procedure. Adjustments were performed in 2 visits [4]. On the third visit, she reported no noise in her left TMJ, left coxalgia, or lumbago on the left side. However, she complained about cheek, tongue and lip biting. These phenomena have been previously reported [5] and disappeared

by the fourth visit, which took place two days after her third visit. There has been no recurrence of symptoms after the 6-month follow-up.

Discussion

Arthrogenous and myogenous symptoms are major TMD indicators and are considered to be caused by occlusal discrepancy between HOP and muscular contact position [6]. Conversely, other TMD-related symptoms include aural symptoms (such as tinnitus, otalgia, and vertigo) as well as headaches, tongue pain, and burning mouth syndrome. These symptoms appear to be related to dental bite problems [7], and reported to be resolved with resolution of the occlusal discrepancy [4, 8]. However, coxalgia has never been reported in relation to TMD. Nicolakis et al. reported that postural and muscle function abnormalities appeared to be more common in the TMD group; they recommended control of body posture in TMD patients, especially in those who do not respond to splint therapy [2]. However, since TMD patients have an occlusal discrepancy, and the posture of the mandible, head and neck may be imbalanced. Accordingly, iliopsoas and quadriceps femoris muscles may compensate to maintain body posture, resulting in an overall poor posture of the TMD patient. Continuous action of quadriceps femoris muscle on articulation coxae may cause pain in the hip joint. Coxalgia of the patient in the present case may have resulted from this aforementioned mechanism. Stack and Sims reported that superior and posterior deviation of the codyle overstimulates the auriculotemporal nerve. This in turn stimulates reticular formation, which then initiates an inhibitory effect, decreasing the voluntary control of the cortex. Involuntary rhythmic tremors, imbalance of posture and gait disturbances result from the same involuntary actions as those that result from the interneuronal connections of the reticulospinal and the nucleus raphe tract [3]. The painful hip joint in the present case may be involved in the stimulation of the auriculotemporal nerve.

Acknowledgement

Written consent was obtained from the patient for publication of the study.

Competing and conflicting interests

The author declares no competing interests.

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