

# Orthodontic treatment for patients with temporomandibular disorder



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In an orthodontic clinic, we encounter diverse patients with mild crowding to severe malocclusion, starting from their early childhood to aged seniors. And it is one of our interests to actually estimate the number of TMD patients within our orthodontic patient pool. The investigation of pretreatment patients of the orthodontic clinic at the Tokyo medical and dental university showed that 37% of malocclusion patients with stable mandibular position indicate TMD symptoms. However, in case of patients with functional mandibular deviation, TMD symptoms were increased up to 59%. These results emphasize the importance of TMJ evaluation especially in patients with unstable mandibular position. In addition, high incidence of TMD was observed in mandibular asymmetry patients. Among other characteristics, asymmetry in the vertical dimension is significantly correlated to the TMD symptoms and therefore it is considered as an important contributing factor for TMD.

For a while, we aimed to establish systematic diagnostic steps for malocclusion patient with TMD by using diagnostic imaging such as MRI, cone beam CT along with functional analytic methods such as EMG and prescale (pressure-responsive film). Here, I would like to share some clinical steps in material taking, diagnosis and treatment flow and discuss measures for orthodontic patients associated with TMD.

## Case 1

31-year-old male came to the clinic with the chief complaint of crossbite and pain on the masseter muscle. Tenderness pain was positive around the masseter and the posterior temporalis region. Movement restriction, TMJ sound was negative. From the EMG, spontaneous muscle activity of the masseter was detected even during the closing phase of jaw movement. Cognitive behavioral therapy for clenching along with splint to relieve pain by the raising the vertical dimension was used. Afterwards, orthodontic treatment was continued to establish ideal mandibular

position followed by orthodontic treatment to establish appropriate mandibular position and occlusion.

## Case 2

11-year-old girl came to the clinic with the chief complaint of upper anterior crowding and TMJ sounds. Reciprocal click on both TMJ was present, but tenderness pain or mandibular restriction was negative. Intraorally, premature contact of the malpositioned upper lateral incisor induced distal displacement of the mandible. From the MRI images, anterior and lateral displacement with reduction was confirmed. To correct the premature contact, upper arch was expanded and aligned. In addition, pumping manipulation was carried out to recapture the displaced disk.

## Case 3

24-year-old female came to the clinic with the complaint of closed lock and facial asymmetry. Her TMD symptoms include bilateral click with intermittent lock on rising. Tenderness pain was present on the occipital region, sternocleidomastoid and temporalis muscle. Her upper right premolar was extracted at the age of 16 to gain space for upper crowding, while one lower incisor was congenitally missing. From the MRI images, anterior displacement with reduction of the lower TMJ was noticed. For this case repositioning splint with open-closing exercise therapy was used to recapture the disk followed by orthodontic treatment to stabilize the occlusion.

## Case 4

33-year-old female came to the clinic with anterior openbite. Mild pain on mandibular movement with click on the right TMJ was present. Mandibular restriction was negative. She had a history was bilateral TMJ pain with closed lock 5 years before coming in for consultation. Bilateral flattening of the condyle was observed from the CT images. She felt that the degree of her openbite worsened from around two years ago. The MRI indicated anterior displacement

without reduction on the right TMJ. Intraorally, no tooth contact was present anterior to the second premolar. After one year of close follow-up of the TMJ, we initiated the orthodontic treatment to establish ideal occlusion.