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## Case Report

# Case report of recurrent temporomandibular joint open lock associated with abrupt reduction of displaced articular disk



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## ARTICLE INFO

## Article history:

Received 3 December 2013

Received in revised form

4 April 2014

Accepted 21 April 2014

Available online 17 June 2014

## Keywords:

Temporomandibular joint

Open lock

Articular disk displacement

MRI

Mandibular movement

## ABSTRACT

**Patient:** This report describes the case of a 51-year-old male patient who initially presented at age 23 with a habitual intermittent open lock (at >35 mm) in the left temporomandibular joint (TMJ). The patient was able to manage this affliction through rapid-repetition jaw opening and closing. Tomography of the joint showed no irregular morphology, but intraoral examination revealed an occlusal interference at the mandibular left third molar during leftwards excursion. For this patient, alteration of lateral guidance using a palatal plate attached to the maxillary left canine precluded this intermittent open lock, but at 22 years of age, the open lock recurred and could not be relieved by the patient, who was unable to assume an occlusal position. Because conservative treatment was ineffective, a pumping manipulation technique was applied to reduce the open lock, after which the patient has maintained good jaw function. MRI taken before and after repositioning indicated that abrupt reduction of a displaced articular disk was the cause of the open lock, and that this articular disk was restored to its proper position during the manipulation.

**Discussion:** Most TMJ open locks occur as anterior dislocation, where the mandibular head becomes trapped anterior to the articular eminences, causing excessive opening and difficulty closing. Our clinical findings from this patient indicate that open lock can occur through abrupt reduction of a displaced articular disk, particularly in patients with chronic internal derangement of the TMJ.

**Conclusion:** TMJ open lock can occur following abrupt reduction of a displaced articular disk.

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<http://dx.doi.org/10.1016/j.jpor.2014.04.001>

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## 1. Introduction

Anterior articular disk displacement with reduction is a typical feature of temporomandibular disorder (TMD). In some cases with intermittent limited mouth opening, this internal derangement leads to disk displacement without reduction [1]. In such cases, extension of the posterior articular ligament allows forward compression of the displaced disk and gradually increases the range of jaw opening. Imirzalioglu et al. [2] performed a longitudinal MRI study of patients with TMJ closed lock and reported no difference in the TMJ images before and after relief of clinical symptoms. In contrast, asymptomatic latent displacement of the articular disk is common in the general population. A systematic review by Naeije et al. showed that 20–40% of control group participants with no TMD symptoms had some form of articular disk displacement [3].

In some cases of chronic anterior disk displacement, abrupt recapture of the articular disk disturbs the mandibular head motion during jaw closing, causing the same clinical symptoms as acute open lock. Such cases may go unrecognized on dental examination, especially if the patient is unaware of their history of disk displacement and if appropriate diagnostic imaging is unavailable.

In this case report, we describe a patient with acute TMJ open lock resulting from recurrence of an articular disk problem that had been successfully treated with placement of a palatal Plate 22 years previously.

## 2. Outline of the case

### 2.1. Patient (male, aged 23 years at initial visit)

The patient was aware of a ‘clicking’ in his left TMJ from the age of 16. At 18 years of age, he experienced left-sided TMJ open lock upon yawning, which he relieved independently, although with significant pain. For 5 years the patient frequently experienced open lock of this joint.

Upon examination at the initial visit, open lock of the left TMJ occurred with jaw opening wider than 35 mm. In this open lock, the patient could not adopt intercuspal position and his jaw locked at 15 mm from his normal occlusal position. Joint lock could be relieved independently through rapid jaw opening and closing, but was somewhat painful. The maximum range of jaw opening after TMJ open lock was 56 mm. Tomography showed no TMJ morphologic abnormality on either side. However, during the left TMJ lock (at 15 mm mouth opening), the left mandibular head was positioned postero-inferiorly beneath the joint cavity and the articular space was enlarged (Fig. 1).

This patient had Angle class I dentition with no crowding and apparently normal occlusion, although the left maxillary and mandibular canines were slightly discluded during maximum intercuspation. The left mandibular third molar was lingually inclined and had a clear occlusal facet buccally (Fig. 2). Examination of the tooth contacts in dynamic occlusion showed that this occlusal contact interfered with left lateral excursions (i.e. was a working-side interference).

### 2.2. Treatment

We initially chose to use a maxillary stabilization-type splint to equalize occlusal contacts, with cuspid guidance applied for lateral dynamic contacts. With this splint in place, intermittent open lock of the left TMJ was relieved. To obtain a more permanent improvement of lateral occlusal contact, a metal splint was attached around the occlusal surfaces from the left maxillary canine to the left first molar, without disturbing maximum intercuspation. During leftwards excursive movement, the splint contacted the lower teeth and guided their disclusion by group function (Fig. 3). After attachment of the metal splint, the previously frequent intermittent open lock did not recur. After 5 months, the metal splint was removed and replaced with composite resin bonded to the palatal surface of the left maxillary canine and to the buccal cusps of both left maxillary premolars (Fig. 4). The occlusal contacts and lateral cusp angles applied to the composite resin guide during left excursion were similar to those of the splint. During the following 5 years, the patient repeatedly experienced abrasion of the composite resin accompanied by an “awkward feeling” of the left TMJ, at which times the resin was replaced and the lateral guide readjusted. During this period, the maxillary and mandibular left third molars were extracted because of unrestorable caries.

Six years after the initial visit, the abrasive resin was replaced with a palatal plate containing a short pin that attached to the left maxillary canine. This palatal plate was made of a gold–platinum alloy and controlled left-sided lateral movements by cuspid guidance (Fig. 5). After this restoration, the awkwardness in the left TMJ disappeared, improving the patient’s function.

Fig. 6 shows mandibular border movement pathways after attachment of the palatal plate, measured using a digital jaw-tracking device (MM-JI, Tokushima University) [4]. The range of maximum jaw opening measured from the incisal edges was 58.1 mm, and the length of the condylar path at the kinematic condylar points was 20.3 mm on the left and 20.1 mm on the right. Mandibular border movements were wide and symmetrical, with no restriction or difficulty in executing jaw movements.

### 2.3. Patient (same individual, at 51 years of age)

The patient had no open lock recurrence for 22 years after attachment of the palatal plate until his TMJ locked again while he was traveling overseas. Unlike previous episodes, this lock could not be relieved independently and occlusal position could not be achieved. Because jaw closing was intensely painful in the left TMJ, the patient was restricted to a liquid diet. Five days after this recurrence, the patient returned to our hospital for treatment.

Occlusal contacts were seen only in the right molar region, with appreciable clearance between teeth on the left side (i.e. a left-sided open bite). Intraoral examination showed no remarkable change in dentition and the palatal plate remained firmly attached to the left maxillary canine. Before visiting our hospital, the patient had taken NSAIDs and had undergone an unsuccessful attempt at manipulative repositioning at a dental clinic. MRI examination showed enlargement of the left

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