

# Evaluation of the Research Diagnostic Criteria for Temporomandibular Disorders for the Recognition of an Anterior Disc Displacement with Reduction

**Mauno Könönen**

Professor

Department of Stomatognathic Physiology  
and Prosthetic Dentistry

Institute of Dentistry

University of Helsinki

and Department of Dental and Maxillofacial  
Diseases

Helsinki University Central Hospital

Finland

Email: mauno.kononen@helsinki.fi

The Focus Article by Naeije et al<sup>1</sup> aims to reconsider the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD)<sup>2</sup> for the recognition of an anterior disc displacement with reduction (ADDR) in the temporomandibular joint (TMJ). According to the authors, the evaluation is based upon the experience gained through the careful analysis of mandibular movement recordings of hundreds of patients and controls with or without an ADDR.

But before addressing the topic of this Focus Article, we should first define the disorder. An internal derangement of the TMJ is anatomically described as a deviation in position or form of the tissues within the capsule of the joint.<sup>3</sup> Mostly, three types of derangements have been recognized; anterior disc displacement with and without reduction<sup>4,5</sup> and hypermobility.<sup>5</sup> TMJ clicking is often associated with these internal derangements. However, no criteria exist for the recognition of internal derangements associated with TMJ clicking(s). On the other hand, TMJ clicking is assumed to be caused by disc displacement,<sup>4,6</sup> irregularities of the joint surfaces,<sup>7</sup> or muscle hyperactivity.<sup>8</sup> Epidemiological studies indicate that TMJ noises, especially clicking of the TMJ, occur up to 60 percent in the general population. Does this high figure suggest a “normal” physiological phenomenon, not a pathologic one? Especially, when TMJ clicking

seldom is troublesome for an individual and it is not known, does clicking in an individual lead to painful TMJ locking?<sup>9,10</sup> Accordingly, most internal derangements are considered to be harmless and cause no or only little discomfort to the subjects and seldom develop into a more serious problem.<sup>11,12</sup> It is not known when and how disc displacement develops into a problematic clinical condition.

As the Focus Article authors state, clinically it is a challenge to discriminate between the two most prevalent internal derangements of the TMJ; ADDR and symptomatic hypermobility. Further, it is due to the very nature of these derangements that they both show clicking on opening and closing (reciprocal clicking), making reciprocal clicking not a distinguishing feature between these disorders. However, there is a difference in timing of their opening and closing clicks. Unfortunately, it is not feasible to use this difference in timing clinically to distinguish between the two internal derangements, because it is the amount of mouth opening at the time of the clicking which is clinically noted, not the condylar translation. In addition, two other criteria proposed by the RDC/TMD for the recognition of an ADDR (the 5-mm difference in mouth opening at the time of the opening and closing clicks, and the detection of joint sounds on protrusion or laterotrusion in case of nonreciprocal clicking), run the risk of false positive or negative results and therefore have no

great diagnostic value. Instead, the Focus Article authors have recommended to examine the elimination of clicking on protrusive opening and closing in order to distinguish ADDR from symptomatic hypermobility. I agree with the authors' view. However, in clinical work, the magnitude and mode of mouth opening may have a significant role in the differential diagnosis; ADDR is mostly unilateral, and causes deviation in mouth opening accompanied by click just before translation of condyle begins and closing click occurs near intercuspal position. However, in the case of symptomatic hypermobility, it is always bilateral and both opening and closing snaps, if found at all, occur near maximal mouth opening. However, according to Nevakari,<sup>13</sup> about 70 percent of his study population showed so-called "elapsio praearticularis." He suggested that the prevalence of the elapsio of the mandibular condyle indicates that it is a normal physiological phenomenon, many times occurring without any clinical signs.

### **Reciprocal Clicking During Opening and Closing**

It is easy to understand that compressive forces during opening and closing differ. The authors have noticed that compressive load in the TMJ during closing can be increased by applying a small downwardly directed force to the patient's chin during closing. When an ADDR is the cause of the TMJ clicking, the acoustic intensity of the closing click will then increase and, in most cases, the patient will also report a (louder) closing click.<sup>14,15</sup> How did the Focus Article authors decide to load about 30 N? Nevertheless, in the case of doubt about the reciprocal nature of the TMJ clicking, the acoustic intensity of the closing click may be enhanced by lightly loading the mandible. This might also result in muscle hyperactivity of the superior head of the lateral pterygoid muscle which, according to Juniper,<sup>8</sup> can pull the disc forward during closing. Further, could loading also increase clicking noise in cases of deviation in form of articular surfaces?

### **Clicking Sounds Reproducible on at Least Two of Three Consecutive Movement Trials"**

It is true that many times there is a large variation in the acoustic intensity of TMJ clicking sounds and this may also (partly) explain the observation in follow-up studies that TMJ clicking

may substantially fluctuate over time.<sup>9,10</sup> Preliminary results from a kinematic study of the 1-year time course of ADDR indicate that in the majority of cases, the ADDR is stable over the period of investigation.<sup>16</sup> Thus, clicking sounds may fluctuate over time whereas the ADDR is in most cases a stable TMJ condition. Variations in the acoustic intensity of ADDR clicking may be related to variations in the compressive load of the TMJ during consecutive movements. A softer clicking sound is then related to a smaller load within the TMJ. The detection of TMJ clicking sounds can then be improved by increasing the compressive load within the TMJ through lightly loading the mandible, not only during closure, but also during opening. Thus, mechanical loading of the TMJ (about 30 N), not only during closing but also during opening, may facilitate the detection of TMJ clicking sounds. Again, we should consider the etiology of the clicking sounds.

### **An Interincisal Distance at the Time of the Opening Click That is at Least 5 mm Greater Than at the Time of the Closing Click**

I readily agree with the authors' statements addressing this point.

### **Elimination of Clicking Sounds on Protrusive Opening and Closing**

Clicking sounds due to symptomatic hypermobility are not eliminated by performing protrusive opening and closing movements and the elimination test offers the possibility to discriminate between the internal derangements of symptomatic hypermobility and ADDR. Thus, the elimination of early opening clicks on protrusive opening and closing does not point exclusively to an ADDR origin of the click (risk of false positives). It is reasonable to assume that elimination of late opening clicks on protrusive opening and closing offers the possibility of discriminating symptomatic hypermobility from ADDR. However, as noted above, Nevakari<sup>13</sup> has suggested that the high prevalence of the elapsio of the mandibular condyle indicates that it is a normal physiological phenomenon and many times without any signs indicating a pathological condition. The study showed also a very significant association between maximal mouth opening and the elapsio.

## Only Clicking on Opening or Closing, and Clicking During Protrusive or Laterotrusive Movements

I agree with the authors that examination of possible joint noises on protrusion or laterotrusion in cases of clicking only on opening or closing has no great diagnostic value. It is better to focus on the reciprocal nature of the clicking by lightly loading the mandible during opening and closing, and also the etiology of clicking.

### Further Considerations

We have found clinically that symptomatic hypermobility shows bilateral “clicking” at the end of maximal mouth opening and at the beginning of closing due to snapping of the condyle-disc complex over the apex of the eminence. ADDRs show reciprocal clicking as the result of the reduction and dislocation of the disc during opening and closing. The opening clicks occur in a broad range of opening movements, the closing clicks occur in a narrow range just before the condyle reaches its end position when the teeth are near intercuspal position.

In considering the differential diagnosis for a clinician, ADDR is mostly unilateral and causes a deviation in mouth opening accompanied by click just before translation of condyle begins and closing click occurs near intercuspal position. In contrast, in the case of symptomatic hypermobility, it is always bilateral and both opening and closing snaps, if found at all, occur near maximal mouth opening. Subjects who have a deviation in form type of internal derangement show unilateral clicking sounds often in the middle of opening and closing movements and almost at the same point, perhaps depending on the tightness of the ligaments attached to the disc.

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