

## Temporomandibular Joint Clicking Noises Caused by a Multilocular Bone Cyst: A Case Report

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### Abstract

When diagnosing patients with temporomandibular disorder (TMD) symptoms, the possibility of unusual causes must be considered, including neoplastic disorders, as well as infections and inflammatory disease. Therefore, radiologic examination may prove to be invaluable in the differential diagnosis of TMDs. This article describes a patient whose temporomandibular joint (TMJ) noise was initially diagnosed by another dental clinic as a TMJ anterior disc displacement with reciprocal clicking. Occlusal splint therapy was used for nearly three to four months but did not improve the TMJ noise condition. When the patient was examined clinically and imaged with magnetic resonance imaging (MRI) and computed tomography (CT), a multilocular bone cyst (MBC) was suspected. The cyst could cause surface irregularities in the posterior part of the left eminence of the temporal bone, which could be the source of the clicking noise.

**Keywords:** Temporomandibular joint disorders, anterior disc displacement, joint clicking, temporomandibular joint imaging

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## Introduction

The diagnostic assessment of temporomandibular disorders (TMD) presents a challenge to the clinician because of the broad range of musculoskeletal, inflammatory, and dental disorders that can be manifested in the temporomandibular joint (TMJ).<sup>1,2</sup>

Tumors and tumor like conditions of the TMJ region are exceedingly rare.<sup>1,3</sup> Most are presented in the literature as isolated case reports.<sup>3,4,5,6</sup>

Symptoms associated with neoplasia of the TMJ may include clicking<sup>6</sup>, preauricular swelling<sup>3,6</sup>, limited mandibular mobility/trismus<sup>1,3,4,5,6</sup>, pain<sup>3,4,5,6</sup>, jaw deviation<sup>6</sup>, progressive mandibular asymmetry<sup>1</sup>, and malocclusion.<sup>1</sup> Unfortunately, these symptoms oftentimes are associated with the more common pathologies affecting the joint, such as internal derangements, myofascial pain dysfunction syndromes, arthralgias, arthritides, traumatic injuries, etc.

Practitioners often embrace TMD as a diagnosis for patients presenting with unexplained orofacial pain or dysfunction without adequately considering other possible diagnoses.<sup>3</sup> Moreover, once this diagnosis has been made, only mechanical intra-articular and musculoligamentous disorders and arthritides may be considered.<sup>3</sup> However, because other pathologic conditions can exhibit symptoms similar to TMD, a dentist may misdiagnose such conditions.<sup>6</sup>

Therefore, when diagnosing patients presenting with these TMD symptoms, a dentist must consider the possibility of unusual causes, including neoplastic disorders, infections, and inflammations.<sup>6</sup> For this reason, after the careful review of the patient's medical history and detailed clinical examination, radiologic imaging may be desired to aid with the differential TMD diagnosis.<sup>2,6</sup>

Recently, advanced radiologic techniques have become popular for evaluating anatomy and pathology of the TMJ such as scintigraphy<sup>7</sup>, tomography<sup>7</sup>, computed tomography (CT)<sup>7,9,10</sup>, arthrography<sup>7</sup>, and magnetic resonance imaging (MRI).<sup>7,8,9,10</sup> MRI is commonly used to investigate pathologies in the soft tissues in and outside the TMJ, and CT allows the clinician to evaluate the osseous structures in the TMJ.<sup>7,8,9,10,11</sup>

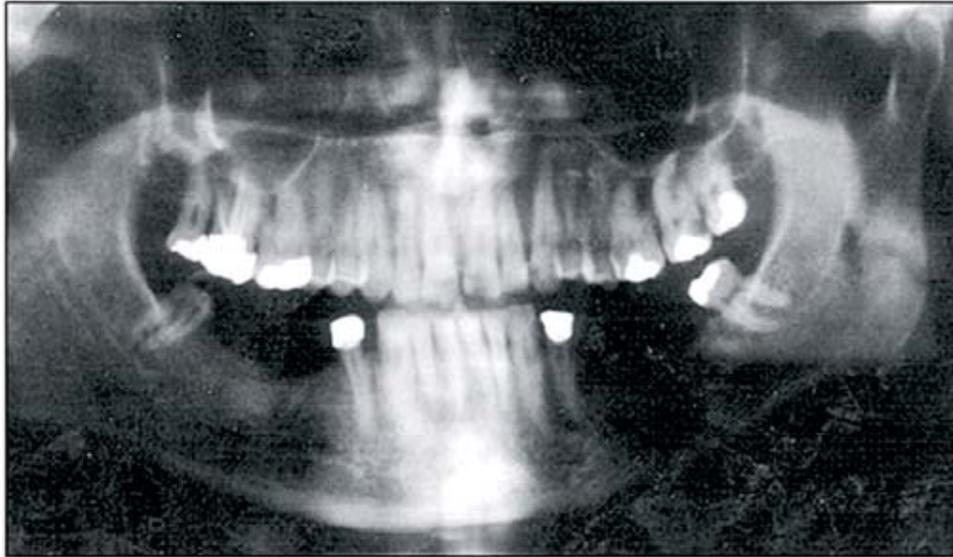
In this clinical report a patient who was misdiagnosed as having an anterior disc displacement with reciprocal clicking (ADD-R) was evaluated by using medical history, clinical examination, MRI, and CT scans. In the light of the clinical and radiological findings, the patient's complaint of TMJ noises were thought to be from a multilocular bone cyst (MBC) causing surface irregularities in the posterior part of the left eminence of the temporal bone.

## Case Report

A 45-year-old male presented to the Department of Prosthodontics in the Faculty of Dentistry at Ankara University seeking treatment for lost teeth. During history taking, the patient reported clicking noises in his left TMJ while chewing. The patient stated the clicking noises could be heard by people around him while eating for the past year. Previously he received a conventional occlusal splint but it had not eliminated or diminished the TMJ noises. After three to four months of use, the patient was referred to our clinic to restore his missing teeth when he lost his motivation to wear the appliance.

Through clinical examination, it was observed the maxilla was fully dentulous and the mandible was partially edentulous with a Kennedy Class III modification I. Palpation of the masticatory muscles and TMJ revealed no pain or limitation of the mandibular range of motion. A clicking noise was noted in the patient's left TMJ during mouth opening, a click (reciprocal clicking) was noted during mouth closing, and the reciprocal clicks occurred at the same degree of opening. Normally, opening reciprocal clicking from an ADD-R occur at a wider opening than the closing click.<sup>1,12</sup> Additionally, the click can be eliminated with protrusive opening which occurred with this patient. It was also observed the midline during maximum opening had minimal deviation. The speed of opening did not alter the interincisal distance of the deviation and location of the deviation was the same for opening and closing; hence, a structural incompatibility was a likely diagnosis.

Panoramic (Figure 1) and transcranial radiographs (Figure 2) did not demonstrate any pathology, so an MRI was obtained.



**Figure 1.** Panoramic radiograph of the patient.

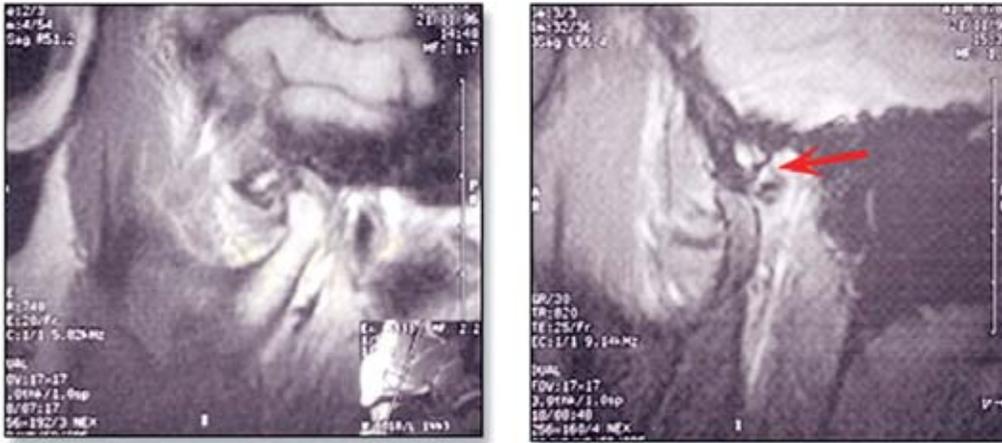


**Figure 2.** Transcranial radiograph of the right and left TMJ, respectively.

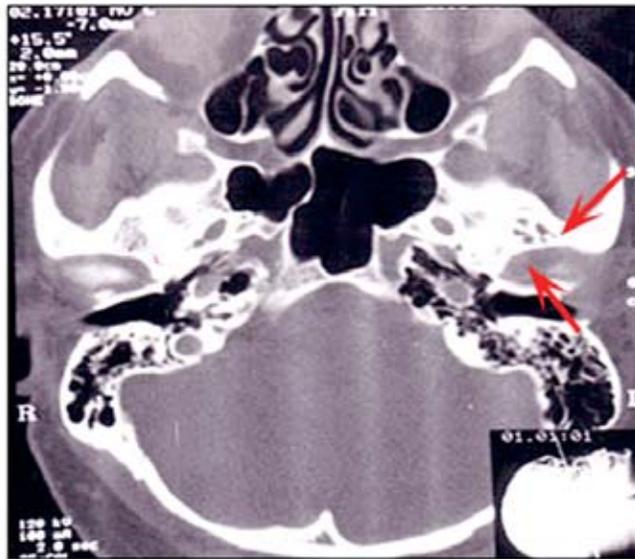
The MRI was made of both joints in the mouth open and closed positions. Oblique sagittal and bilateral coronal images were obtained. In the images of the closed position, the discs of left and right TMJ were in their normal position relative to the mandibular condyle (Figure 3a). The images made with the mouth open demonstrated no pathology with the anterior translation of the disc or condyle on either side. However, an osteolytic lesion that looked like a MBC was visible in the posterior region of the left eminence of the temporal bone (Figure 3b).

This osteolytic lesion was hyperintense in  $T_2$ -weighted sequence causing speculation the lesion was filled with fluid.<sup>10</sup> It appeared this osteolytic lesion was causing mild irregularity of the left eminence surface and the clicking noises as the disc-condyle complex traveled over it.

Since the lesion was in bone, a CT image was requested to better understand the nature and the extent of the lesion (Figure 4). The findings on non-contrast axial CT with 5 mm slice thickness indicated there was a strong possibility it was a



**Figure 3.** MRI of the open-mouth and closed-mouth positions. (a) MRI of the closed-mouth position demonstrating a normal condyle disc relation. (b) MRI of the patient's open-mouth position. The bone outgrowth formed in temporal fossa towards articular eminence is indicated with red arrow.



**Figure 4.** The formations on the patient's left side temporal bone, supposed to be a multilocular bone cyst, are indicated with red arrows. While these formations display an asymmetric layout, they are not observed on the right temporal bone region.

MBC. Histopathological tests were not performed because the patient declined an operational procedure.

### Discussion

TMJ clicking is a very common TMD symptom and is usually considered as a sign of TMJ disc displacement.<sup>1,13</sup> It is characterized by an anterior displacement of the articular disc in the closed jaw position. A click may be felt during opening

(single click), closing (single click), or both opening and closing (reciprocal clicking).<sup>1,12,13</sup>

In the clinical examination of the patient there were very clear clicking noises during the mouth opening and closing; at first, the patient had given the impression of having a left TMJ ADD-R. The patient related it was diagnosed as ADD-R, and his TMJ sounds complaint was unsuccessfully treated with occlusal splint of conventional

therapy. This caused us to question the validity of the previous diagnosis and the presence of a clicking noise at the same opening and closing position has been suggested as a sign of bony osteophyte or enlargement on the articular eminence.<sup>12</sup>

For the differential diagnosis of an ADD, MRI is often considered the "gold standard"<sup>18</sup> so a MRI was made of the left TMJ. Gale and Gross<sup>14</sup> focused on TMJ clicking from the perspectives of rheumatology and arthrology and concluded clicking could be disregarded when it is the sole symptom. Pharoah<sup>15</sup> stated imaging is unnecessary for patients whose only complaint is clicking. The author stated this symptom can be regarded as a signal of change in a healthy joint rather than an indication of TMJ related disease. Pharoah advocated imaging techniques only be used in cases where the clinical picture includes soft-tissue swelling near the joint, fever, recent mouth-opening restrictions, mandibular deviation, occlusal changes, history of trauma in mandibular or joint regions, abnormal symptoms, and/or pain in the TMJ.

The MRI revealed a bone lesion which appeared as a prominence on the left eminence in the temporal bone region. This bone lesion caused a disturbance in the smooth flow of the condylar disc during mouth opening and closing. Hence, this caused the clicking noise and deviation.

A CT scan was requested. It is excellent for evaluating bone lesions and is the most frequently used imaging technique to evaluate osteolytic lesions, such as aneurysmal bone cysts or

tumors that imitate pneumatic lobules. Pneumatic lobules can be visualized incidentally on radiograph without nonexpansile, nondestructive characteristics. The air lobules in the temporal bone region are often the sites through which pathology spreads into the TMJ region. Some authors have emphasized the significance of these lobules in relation to TMD and have recommended imaging be done prior to any surgery in this region.<sup>16,17</sup>

This patient's bone lesion was asymmetrical, expansive, and hyperintense in T<sub>2</sub>-weighted sequence. In T<sub>2</sub>-weighted sequence the water gives off the brightest image and, thus, the presence of a fluid can be proven.<sup>10</sup> This is the reason we interpreted it as a cyst rather than a pneumatic lobule.

Radiological assessment does not always provide sufficient information to diagnose these osteolytic lesions, and histopathological examination is usually necessary. The osteolytic lesion we detected in our patient had the strong possibility of being a MBC. Histopathological tests were not performed because the patient declined any operational procedure.

### Conclusion

Clinicians who assess TMD patients must have sound knowledge of neoplasms that affect the head and neck, neurological disorders, and chronic pain syndromes and systemic disorders that can impact the head, neck, and masticatory regions. The possibility of other unusual causes needs to be carefully considered and imaging may be indicated.

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