

A Rare Case of Misdiagnosed Silent Lung Cancer with Solitary Metastasis to the Temporomandibular Joint Condyle

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This article describes the case history of a 59-year-old female patient who sought advice for temporomandibular joint (TMJ) pain and sounds but who was actually diagnosed with a primary lung cancer with metastasis to the TMJ. The patient had a history of TMJ pain and deflection in jaw movement that progressively worsened over a few months and did not improve with the usual standard of care treatment provided by an orofacial pain practitioner. Magnetic resonance and computed tomography (CT) prescribed at a tertiary clinic showed an osteolytic bone mass within the right TMJ condyle. The neoformation was surgically removed and histologic assessment revealed it was a metastasis of a silent lung carcinoma. Thorax CT confirmed the presence of a formation within the apical segment of the right lung superior lobe. While this scenario of a silent lung cancer metastasis to the TMJ condyle mimicking classical symptoms of temporomandibular disorders (TMD) is rare, it does indicate that the path to differential diagnosis is often difficult in TMD and orofacial pain patients, and that practitioners managing such patients should be aware of the variegated spectrum of possible TMD-mimicking conditions to avoid dangerous diagnostic delays. *J Oral Facial Pain Headache* 2017;31:180–185. doi: 10.11607/ofph.1672

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Pain in the temporomandibular joint (TMJ) area is a symptom that affects up to 8% of the general population.¹ Differential diagnosis is a concern and involves several conditions and diseases²; in particular, while temporomandibular disorders (TMD) are the most common reason for TMJ pain, other more severe local or systemic pathologies (eg, polyarthritides, fibromyalgia, tumors) should be ruled out. Among these, neoplasms of the TMJ have a rare but non-negligible prevalence.³

In general, most of the literature on TMJ neoplasms consists of descriptions of or systematic reviews about the prevalence of benign tumors, such as osteoma and chondroma,^{4,5} or pseudotumors, such as synovial chondromatosis and cysts of different type and location.^{6–8} The report of malignant tumors and metastasis is uncommon, with a very fragmented literature and uncertain prevalence data.^{9,10} Clinically, the manifestations of such malignant occurrences are unspecific, often mimicking TMD-like signs and symptoms. It is important that orofacial pain practitioners appraise the possibility that the TMJ is affected by life-threatening conditions, and a report of any new cases could help increasing knowledge on this topic with positive effects on differential diagnosis.

Within the malignancies potentially affecting the TMJ, nonprimary tumors have been described with the primary lesion localized in the lung, breast, prostate, skin, liver, or rectum.^{11–13} In total, the literature accounts for very few cases (ie, 48 patients based on a review published in 2010),¹⁴ the majority of which refer to patients with well-known primary tumors that gave secondary TMJ neoplasms. Notwithstanding this, a small minority of patients may have TMJ metastases mimicking TMD-like symptoms in the absence of known information on concurrent primary tumors.¹⁵ In these cases, the diagnostic challenge is difficult,

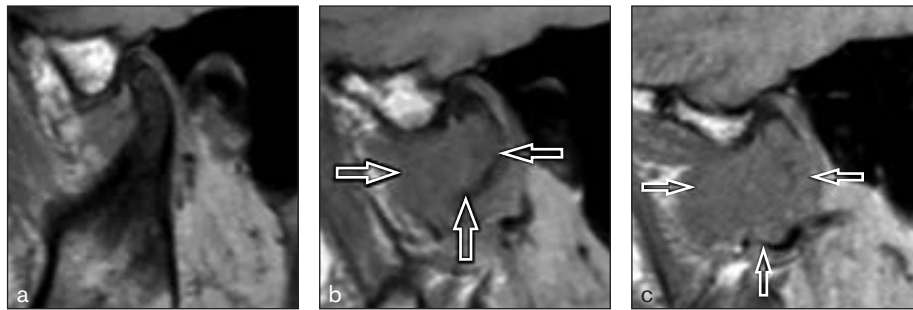


Fig 1 MRI sagittal slices of the right TMJ in the closed-mouth position from the lateral to medial aspects. **(a)** Signs of dishomogenous disc structure, with a normal disc-condyle relationship. **(b)** Alteration of signal within the lateral pterygoid muscle due to the presence of the condylar mass (arrows). **(c)** Very unspecific condylar mass (arrows), requiring diagnostic deepening with CT.

and improper treatment due to delayed diagnosis may be a serious concern.

The present article describes the case history of a patient seeking advice for TMJ pain and sounds but who was actually diagnosed with TMJ metastasis from a primary lung cancer.

Case Report

A 59-year-old female came to the Department of Maxillofacial Surgery, University of Padova, Padova, Italy, complaining of pain and joint sounds in the right TMJ area. Pain onset dated back to 2 months earlier, and symptoms had progressively worsened over time. The patient had a history of a negative dental assessment; her dentist detected no dental occlusal abnormalities and suggested that she seek specialist advice. History taking did not reveal any relevant medical conditions (eg, systemic diseases, rheumatologic conditions, neurologic disorders), except that the patient smoked 10 to 15 cigarettes a day. She did not report any past or recent trauma to the maxillofacial region. An orofacial pain practitioner diagnosed that she had TMJ arthritis, and a combined approach based on counseling, anti-inflammatory drugs, and an oral appliance was adopted.

Due to the progressive worsening of symptoms with the proposed treatment regimen, the patient opted to seek a second opinion and came to the University Clinic. The clinical assessment was negative for swelling of the preauricular area or asymmetry of the face. The patient reported severe familiar pain with both lateral and posterior palpation of the right TMJ, and a limited condylar translation during mouth opening (ie, 30 mm) with an 8-mm deflection to the ipsilateral side was shown. The patient mentioned that pain was initially fluctuating, with an average of 3 out of 10 on a visual analog scale (VAS) scale, but

then became progressively worse, persistent, and almost unresponsive to anti-inflammatory drugs (ie, ibuprofen 600 mg). Joint sounds were actually absent during spontaneous movements, and a fine crepitus sound in the right TMJ was detected upon dynamic tests (ie, with the examiner applying a slight manual counterpressure to jaw movements). Muscle palpation was positive for pain in the right lateral pterygoid, without any other relevant clinical signs or symptoms in the other jaw muscles. The fifth and seventh cranial nerves did not show any deficit, and there was no palpable lymphadenopathy within the maxillofacial region. Based on the Diagnostic Criteria for Temporomandibular Disorders (DC/TMD),¹⁶ a two-fold clinical diagnosis of TMJ arthralgia (based on the presence of familiar pain on palpation and during jaw motion) and degenerative joint disease (DJD) (due to the presence of crepitus sounds) was assigned.

Due to the unspecific clinical picture, the unusual presentation, and the history of treatment failure (and despite the theoretical need to prescribe computed tomography [CT] as the gold standard to depict degenerative changes within the TMJ), magnetic resonance imaging (MRI) was performed. The rationale for prescribing MRI instead of CT as the first choice for imaging technique was the attempt to look further into the differential diagnosis of pain and joint deflection—although symptoms might have been most likely due to TMJ osteoarthritis, the failed response to usual treatment and the likelihood of a mass-occupying lesion of intra- or extra-capsular location led to the prescription of MRI because of its possible greater influence on diagnostic thinking. MRI revealed some signs of disc degeneration without any abnormalities of the positional disc-condyle relationship in both sides. The joint capsule was slightly swollen. The MRI findings were positive for a solid-signal lesion at the right mandibular condyle (Figs 1 and 2). A CT, with and without contrast enhancement, was also performed to gain a

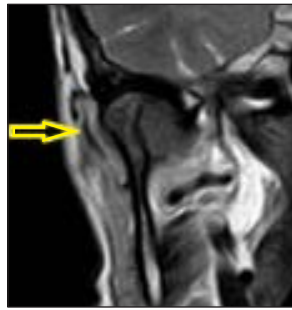


Fig 2 (left) MRI frontal view of the condylar mass (*arrow*) and (right) evidence of a slight lateral capsular distension (*arrow*).

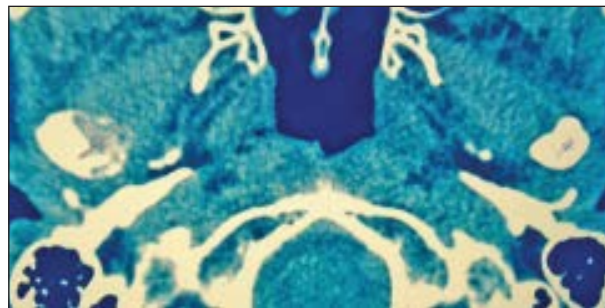


Fig 3 CT slices showing an osteolytic mass within the right TMJ condyle (*arrow*). (left) Frontal, (middle) coronal, and (right) sagittal views.

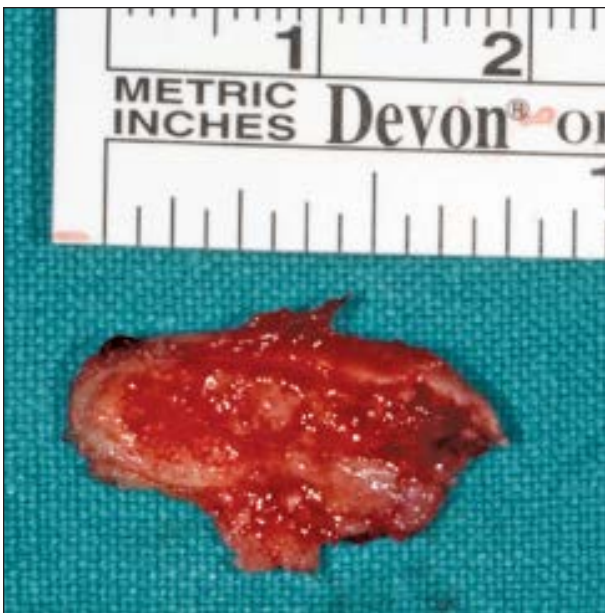


Fig 4 Condylar bone removed with the neof ormation.

deeper diagnostic insight, and a solid osteolytic neof ormation with an interruption of the cortical profile of the right condylar head was shown (Fig 3). The neof ormation was multichambered and located on the anterior medial condylar surface. It was about $1.4 \times 1.2 \times 1.4$ cm in size. The contrast enhancement was not relevant in either the arterial or venous phases after the injection. Based on the imaging findings, a surgical intervention for removal of the neof ormation was

planned. During the preoperation phases, in order to try having preliminary information on any other possible lesions and due to the impossibility of performing positron emission tomography (PET) scans in the institute, the patient also underwent an X-ray examination of the thorax, which was negative for any lesions.

TMJ surgery was performed to remove the neof ormation, with concurrent condyle/disc remodeling (Fig 4). Histologic assessment provided a diagnosis of secondary carcinoma of possible lung origin. A follow-up CT scan 3 weeks later showed the outcome of condylar resection, with an ongoing healing process along the free margin and fibrocalcifications involving the surrounding soft tissues (Fig 5). The patient's pain was slightly decreased and mouth opening was straight. The same day, a thorax CT was performed, detecting a $1.5 \times 1.5 \times 2$ -cm formation within the apical segment of the right lung superior lobe (Fig 6). Such formation was linked to apical, mediastinal, and rib margins of the pleura. The surrounding lung tissues featured millimeter-sized, glass-like patches, the largest of which was in the anterior segment of the superior lobe of the right lung. The other lung areas featured thin, dense streaks and some millimeter-sized air bubbles. There was a subtle pericardial film gathering over the diaphragm, and mediastinal lymph nodes were less than 1 cm. Thoracic base scans showed a hypodense area of possible fluid origin at the hepatic dome, as well as a calcified spot within the right kidney superior pole. In the following weeks, a total body CT for disease staging did not show any other secondary lymph nodes or visceral lesions.



Fig 5 Postsurgical CT at 3 weeks, showing the ongoing healing process (arrow indicates previous location of the mass).

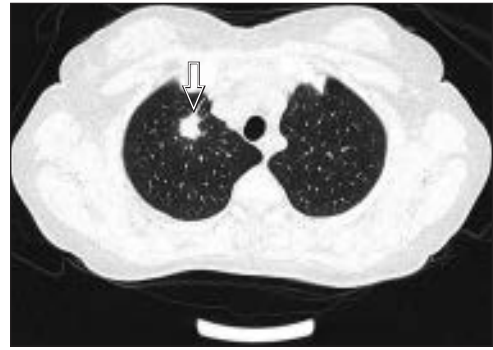


Fig 6 Primary cancer site (arrow) was located within the apical segment of the right lung superior lobe. (left) Frontal and (right) coronal views of the lung lesion.

Based on these findings, the patient started oncology treatment for both the primary and secondary cancers, with CyberKnife therapy on the primary lung cancer associated with systemic chemotherapy and radiotherapy on the right condylar area. Unfortunately, about 8 months after the beginning of the treatment regimen, systemic conditions of the patient got progressively worse, and she died 13 months after the initial diagnosis.

Discussion

TMD are a heterogeneous group of conditions affecting the TMJs and/or the jaw muscles. The course of symptoms usually resembles the fluctuating and often self-limiting nature of many similar musculoskeletal disorders.¹⁷ Thus, first-step, low-invasiveness approaches to diagnosis and treatment are recommended. Notwithstanding this, professionals involved in the management of TMD patients cannot overlook more rare diseases, and they should understand that the differential diagnosis process is sometimes more complex than expected.

In the present case, the diagnostic hypothesis and treatment regimen provided by the first professional were in line with current standards, since the first-step diagnosis of TMJ osteoarthritis was partly confirmed by the specialist assessment, leading to a provisional clinical diagnosis of TMJ arthralgia and degenerative joint disease.¹⁶ However, the unremitting pain as well as the deflection in mouth opening should have alerted the clinician to other possible explanations for the patient's symptoms. Neuralgias, neuropathic pain, rheumatologic diseases, and rare TMJ conditions are examples of conditions that should have been ruled out during a

third-level assessment. The case history thus could suggest possible limits to the application of the DC/TMD guidelines, as these may expose patients to the risk of false-positive TMD diagnoses because of the presence of unspecific symptoms that are actually due to other disorders. On the other hand, it must be noted that the DC/TMD warns users that these are clinical criteria that provide at best a provisional joint diagnosis requiring confirmation with TMJ imaging, thus alerting clinicians against possible misuse of the diagnostic algorithms.¹⁶

In the present case, the prescription of TMJ imaging led to the revision of first-step diagnosis to TMJ neoplasm. This means that, while efforts have been made to define diagnostic criteria for TMD, classification schemes based on symptom clusters may sometimes overestimate the presence of TMD when the primary source of TMD-like symptoms is difficult to identify. The DC/TMD guidelines recommend the adoption of CT (or cone beam computed tomography [CBCT]) as the reference imaging technique for TMJ degenerative changes, but MRI was instead chosen in the present case as the next technique because of the unusual case presentation and the failure of usual treatment, as well as MRI's potentially greater influence on treatment decisions as far as differential diagnosis of pain is concerned. Indeed, although CT offers a better depiction of the degenerative changes, it was not likely that the actual severity of these changes would have influenced the treatment approach to TMJ osteoarthritis, if confirmed; additionally, MRI has a better record of detecting inflammatory changes that may explain (or not explain) the clinical symptoms. Within these premises, the need for a widespread diffusion of imaging has been extensively discussed in the literature with investigations on MRI agreement with the clinical assessment on one hand¹⁸

and suggestions on how to prescribe it effectively on the other hand.¹⁹ Therefore, even if the missed prescription of MRI or CT at the first appointment by the previous professionals may be understood, it can be argued that it led to a diagnostic delay, since a first-ever TMJ pain and mouth opening deflection in a 59-year-old person may be a warning sign of some possible uncommon conditions that warrant an imaging study at initial presentation. Prescription of TMJ imaging should have been mandatory once the treatment regimen for TMD had failed. The MRI and CT showed the presence of an abnormal structure and form of the right condyle compatible with a tumor-like finding, and this led to the final diagnosis of condylar metastasis of lung cancer. Unfortunately, the stage of disease was too advanced to change the scenario.

Some considerations should be noted regarding this case history. First, this occurrence is rare. A literature review covering a span of more than 50 years and updated in 2008 found a total of 48 patients with TMJ metastasis of a malignant tumor, primarily located in the breast (34%).¹⁴ Some other cases have been described after that review, which reported that in more than half of the cases ($n = 28$), the TMJ condyle was affected after the primary cancer was already diagnosed, making the diagnostic challenge less difficult; in the remaining 20 cases, TMD-like symptoms were the first sign of otherwise silent malignancies. Second, even if rare, neoplasm should be ruled out in the differential diagnosis when untreatable pain in the TMJ area is present. In contrast to malignancies in other body sites, which often stay silent until the late stages, pain is a very common symptom of cancer of the oral and maxillofacial region.²⁰ At present there are no data on TMJ tumors, but it has been reported that oral cancer is painful in more than 70% of cases, possibly due to the widespread diffusion of trigeminal innervation.²¹ This means that the timeliness of orofacial pain practitioners to arrive at a diagnosis may be fundamental as far as the prognosis of survival is concerned. Third, a further peculiarity of the present case history was the absence of other concurrent metastases. Indeed, it was reported that jawbone metastasis usually occurs in the very late stages of disease, when the primary cancer has already reached widespread diffusion.²² Such metastases are mainly located within the mandibular body and, at present, solid knowledge on the pathobiologic mechanisms underlying the diffusion of primary malignancies to the TMJ condyle is lacking. The most plausible hypothesis is hematologic dissemination, which could explain the rare condylar involvement due to the lower representation of bone marrow with respect to the mandibular body.²³ However, the solitary metastasis to the TMJ condyle as described in the present case is extremely rare.

Conclusions

The patient described in this case had a very unfamiliar clinical scenario, with symptoms within the TMJ area that were actually due to a silent metastatic lung cancer mimicking symptoms of common TMD. Given the absence of any other symptoms at the primary site, practitioners involved in the management of orofacial pain patients should be alerted to the need to rule out secondary neoplasms to the TMJ during the differential diagnosis process.

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