

## **Painful Swelling of the Temporomandibular Joint**

**Peter F. van der Ven, DMD, PhD; Jeffery A. Burgess, DDS, MSD;  
Lars G. Hollender, DDS, PhD**



The following Case Challenge is provided in conjunction with the American Academy of Oral and Maxillofacial Pathology.

### **Case Summary**

In September 1999, a 59-year old woman was referred by her dentist to an Oral Medicine practice for evaluation of acute pain and swelling in her right temporomandibular joint (TMJ).

After you have finished reviewing the available diagnostic information, make the diagnosis.

## Diagnostic Information

### History of Present Illness

Approximately ten days before she was seen, the patient described feeling that her jaw had dislocated while she was laughing. She had heard a “bump” and noticed that trying to open her mouth beyond a certain point caused pain in the right side of her face. The area was sore, visibly swollen, and painful to chew and yawn. When closing the mouth, the right posterior teeth made contact before the left ones. There were no joint sounds on either side during jaw movement and no previous history of joint sounds catching or locking. The trauma history was negative.

The patient was under considerable stress and had become aware of frequent jaw clenching. Her husband had a serious heart condition and was unable to work. He had cardiac bypass surgery three years before and was scheduled for angioplasty the next week. The patient was worried about her husband, their two teenaged children, finances, and health care costs. She admitted to using chewing gum in the past, but other parafunctional habits were denied. The patient had mild headaches that occurred less than once per month. She averaged 6-7 hours of sleep per night, which she judged to be less than adequate. Her jaw ached and the attached musculature felt tired on awakening.

### Medical History

The patient described her health as good and was due for her annual medical examination. Recent illness, hospitalization, and surgery were denied. A hysterectomy for cervical cancer had been performed in 1989 and the patient received medical treatment for parathyroid adenoma in 1996. A brief review of systems appeared unremarkable.

- Current medications included: estrogen, methocarbamol (500 mg QID), and vitamin supplements.
- Allergies: none known.
- Tobacco, alcohol, and caffeine use were denied.
- The patient had been married for thirty-two years.

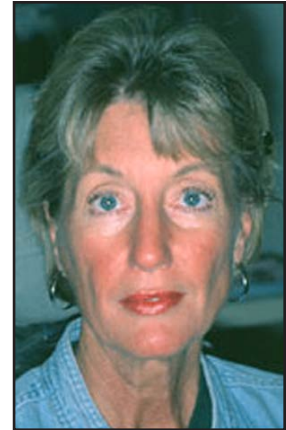
- She was employed fulltime as a legal assistant and enjoyed her work.

### Examination Findings

The patient was a well-nourished, well-groomed female in no apparent distress.

**Vital signs:** BP = 130/90, HR = 70, Temperature = 97.1° F (36.2° C).

**Head and Neck:** A firm, fixed swelling measuring approximately 3 cm diameter x 0.5 cm high was present in the right preauricular area, just below the TMJ. Cranial nerves V and VII were grossly normal, although the smile was slightly asymmetrical as shown here. The external auditory canals were occluded by wax.



The Temporomandibular Disease (TMD) exam followed the Research Diagnostic Criteria (RDC) for TMD.<sup>1</sup> The patient indicated recent pain in both sides of her face. The left masseter muscle was mildly tender, and the right masseter was moderately tender to palpation. The lateral pole of the right TMJ was moderately tender, but not the posterior attachment. No TMJ sounds were heard on stethoscopy. Painless opening was limited to 15 mm interincisally. Maximum opening was only 25 mm and occurred with right preauricular pain. Lateral excursion of the jaw was 10 mm to the right, but only 6 mm to the left with right facial pain. No deviation was noted on jaw opening or protrusion.

Oral hygiene was excellent. The oral mucosa was unremarkable. The right parotid gland was non-tender and clear, serous fluid could be easily expressed from Stenson's duct. The dentition was intact and well restored with mild wear in the anterior teeth.

### Panoramic Radiograph

Initial review of the panoramic radiograph was thought to reveal bifid mandibular condyles, a



variant of normal. The maxillary sinuses were clear and their borders intact. There was a suggestion of recurrent caries in teeth #2 and #15.

Subsequent review of the panoramic film by an oral and maxillofacial radiologist indicated that there was also significant loss of bone density in the right ascending ramus and a loss of cortical integrity in the right condylar neck. Superimposition of air in the oropharynx over the right and left ascending rami made detection of this radiolucent area in the original film difficult.

### **Impression and Initial Treatment**

The history and examination suggested an acute, non-reducing disc displacement of the right TMJ with possible rupture of the lateral aspect of the joint capsule. A lateral disc displacement would be quite unusual, and an MRI was recommended to confirm the diagnosis. The patient declined because her insurance company refused to provide benefits for treatment on the grounds that it was for a "TMJ condition."

Behavioral modifications were recommended: a soft diet and avoidance of clenching and excessively painful opening. Anti-inflammatory therapy was begun with six days of a systemic corticosteroid, methylprednisolone, followed by Sulindac, a non-steroidal anti-inflammatory drug (NSAID). The patient was already taking a muscle relaxant. Fabrication of a flat plane occlusal splint was recommended.

### **One Month Follow-Up**

The patient was taking Sulindac as prescribed. Her right facial swelling was unchanged, but she could open her mouth more easily. Jaw rest and medication helped to ease constant pain in the right preauricular area, which had an average intensity of 5 on a scale from 0 (none) to 10 (worst imaginable).

The patient was still aware of clenching her teeth frequently. Her general dentist fabricated an occlusal splint that she wore at night and while concentrating at work. Maximum opening was 24 mm, with preauricular pain and jaw deviation to the right. Both masseter muscles were mild-moderately tender.

An MRI was again recommended but deferred. The patient's husband had been told that his cardiac condition was terminal, and the family's financial stability was of greater concern.

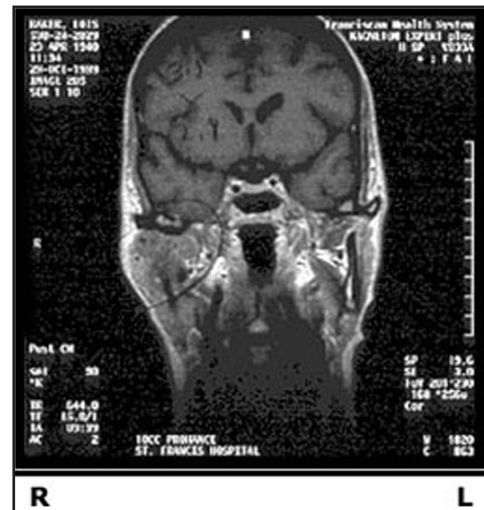
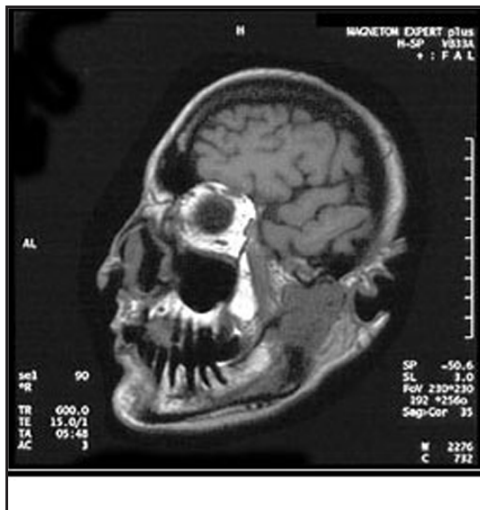
### **Subsequent Course**

At her annual physical exam six weeks after her initial orofacial examination, the patient presented with "vague abdominal pain and weight loss." She had lost approximately 15 lbs., which she attributed to pain in her right jaw and limited ability to chew. She described having mild bloating but denied nausea, vomiting, cramping, diarrhea, or blood in her stool. An abdominal ultrasound was ordered and showed diffuse liver masses. Subsequent colonoscopy demonstrated an obstructing tumor of the left colon. A partial sigmoid colectomy was performed to remove a 3 cm, moderately differentiated adenocarcinoma. The patient received chemotherapy (type not specified in the available records), followed by 5000 cGy of 16 mv electron beam radiation therapy to the tumor mass in her mandible. She tolerated treatment well, with decrease in both pain and anesthesia in her jaw. She is currently living at home and working part time. She recently reported new metastases and a worsening prognosis.

### **Transcranial Radiographs and Magnetic Resonance Imaging**

Transcranial (lateral) views of the TMJ's (not shown) suffered from so much superimposition as to be of questionable value. A medical radiologist noted normal cortical surfaces of the mandibular and the temporal bones and an absence of anterior translation on opening. MRI was recommended for a more informative evaluation (see below).

The MRI report states, "The dominant finding is the presence of a mass lesion which involves the right mandibular ramus extending towards



the right temporomandibular joint. This mass measures 3.5 x 2.8 x 3.5 cm. The mass extends into the pterygoid musculature medially and extends laterally into the buccal musculature. This is causing bony destruction of the right mandibular ramus extending to the level of the right TMJ joint and most likely represents a metastatic lesion. No evidence of metastatic disease involving the brain."



### Can you make the diagnosis?

In September 1999, a 59-year old woman was referred by her dentist to an Oral Medicine practice for evaluation of acute pain and swelling in her right temporomandibular joint (TMJ).



### Select the Correct Diagnosis

- A. Masseter Muscle Spasm
- B. Acute Non-Reducing TMJ Disc Displacement
- C. Acute or Chronic Parotitis
- D. TMJ Sepsis or Temporal Osteomyelitis
- E. Benign or Malignant Tumor (Primary or Metastatic)

## Masseter Muscle Spasm

**Choice A. Sorry, this is not the correct diagnosis.**

Acute, unilateral masseter muscle spasm may follow long dental procedures or may represent a response to stress. It may cause moderate to severe pain, typically resulting in trismus (reduced range of motion). It may be accompanied by a feeling of swelling and/or partial numbness. Painless jaw opening is often less than 20 mm.

However, masticatory muscle spasm is unlikely to cause visible facial swelling, especially not firm, localized swelling. Lateral pterygoid spasm after a long dental appointment can also cause significant pain, with deviation to the affected side on opening. However, it could not account for firm, visible swelling of the type observed in this case.

Please re-evaluate the information about this case.



## Acute Non-Reducing TMJ Disc Displacement

**Choice B. Sorry, this is not the correct diagnosis.**

Acute, unilateral displacement of a TMJ disc typically prevents condylar translation, causing localized preauricular pain and deviation to the affected side on opening. Muscle splinting may contribute additional pain. The patient often complains that the jaw is locked and may be unable to open more than 15-25 mm interincisally without pain. The patient may report a sense of

swelling, but this is likely to be neither visible nor palpable. There may be a history of clicking or popping that suddenly ceased or changed to a grinding type of sound after the jaw locked. The risk factors for this condition have not been fully identified but appear to include certain types of trauma (including direct or indirect impact or an event during chewing or wide opening), parafunctional jaw clenching, nocturnal bruxism (tooth grinding or clenching), and mandibular hyperextension during surgical procedures.

Please re-evaluate the information about this case.

## Acute or Chronic Parotitis

### Choice C. Sorry, this is not the correct diagnosis.

Acute bacterial parotitis (ABP) has traditionally been caused by dehydration while in the hospital following general anesthesia and surgery.<sup>2</sup> ABP is now more commonly acquired in the community when salivary flow is reduced by dehydration, medications, systemic illness, or obstructed by stones or mucous plugs.<sup>3</sup> The organisms most commonly involved are *Staphylococcus aureus*, *Haemophilus influenzae*, and *viridans streptococci*.<sup>2</sup> Gram negative organisms are more likely to be found in nosocomial parotitis.

Clinical signs are likely to include cheek swelling, tenderness, erythema, and purulent discharge from the duct. The systemic signs of infection include: fever, chills, elevated WBC, and regional lymphadenopathy. Needle aspiration and culture may aid the diagnosis. CT and MR imaging typically reveal diffuse parenchymal edema rather than focal abscess.

Systemic conditions that are associated with parotid gland enlargement, such as alcoholism,<sup>4</sup> bulimia,<sup>5</sup> and chronic parotitis,<sup>6</sup> often involve both glands. Viral illnesses, such as mumps and human immunodeficiency virus, may also cause enlargement of both salivary glands.<sup>7</sup> However, none of these conditions will cause jaw pain and dysfunction.

The differential diagnosis of parotid enlargement includes a variety of serious conditions: lymphoma, actinomycosis, cat scratch disease, sub-masseteric abscess, granulomatous, autoimmune conditions, and viral illness.<sup>3,8,9</sup> Complications result from the spread of infection into the deep neck, with potential airway obstruction, mediastinitis, pneumonia, venous thrombosis, and carotid erosion.<sup>3</sup> In the present case, clear serous fluid was easily milked from the right parotid duct. The further absence of signs and symptoms of systemic infection (e.g., malaise, fever) made a diagnosis of acute parotitis very unlikely.

Please re-evaluate the information about this case.



## TMJ Sepsis or Temporal Osteomyelitis

**Choice D. Sorry, this is not the correct diagnosis.**

Acute sepsis of the temporomandibular joint or adjacent temporal bone is an uncommon condition usually presenting with the manifestations of acute inflammation: pain, swelling, warmth, and erythema.<sup>10,11,12</sup> There may also be painful, limited opening and malocclusion. Common infective organisms are *Neisseria gonorrhea*, *Staphylococcus aureus*, *streptococci*, and, in children, *Haemophilus influenzae*.<sup>10,11,13</sup> Infection may spread to the joint from adjacent infections of the external or middle ear, parotid gland, or a tooth. Hematogenous spread from

a distant site is also possible. Blunt trauma is a common causative factor and may complicate the diagnosis because of possible condylar fracture. The correct diagnosis is suggested by fever, leukocytosis, and regional lymphadenopathy and may be confirmed by needle aspiration.<sup>10,11</sup> Panoramic or CT imaging may show a widened joint space, local inflammation, and condylar erosion.<sup>11,13</sup> TMJ sepsis carries a high morbidity with potential for mortality if not diagnosed and treated early. The absence of signs and symptoms of infection in the present case made a diagnosis of acute TMJ sepsis unlikely.

Please re-evaluate the information about this case.

## Benign or Malignant Tumor (Primary or Metastatic)

### Choice E. Congratulations! You are correct.

This patient had an adenocarcinoma of her colon, which had metastasized to her right condyle and lateral pterygoid as well as masseter muscles. About 1% of oral malignancies are from secondary sites, most commonly the breast, but also lung, kidney, thyroid, prostate, and colon.<sup>14-23</sup> Adenocarcinoma accounts for about 70% of tumors that metastasize to the jaws, more often the mandible.<sup>19</sup> In about 20% of cases, a metastatic lesion is the first indication of the presence of a malignancy. Initial tumor growth may occur without signs or symptoms. Later, as in the present case, patients may present with limitation of jaw movement, pain, swelling, and ear fullness; several of which are also potential TMD symptoms.<sup>14</sup> Pathological fracture, neurosensory changes, and bleeding have also been reported.

Other types of tumors that might involve the condyle include primary malignant bone tumors (especially osteosarcoma and chondrosarcoma), malignant odontogenic tumors (especially malignant ameloblastoma), malignant salivary gland tumors (particularly central mucoepidermoid carcinoma), lymphoma, and a variety of other metastatic tumors.<sup>15,17,24,25</sup>

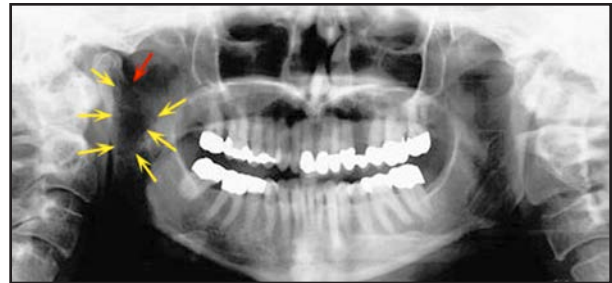
### Discussion

This case is presented to highlight the importance of a thorough differential diagnosis when evaluating patients for a TMD. It illustrates what may happen when an uncommon but ominous diagnosis is not included in the list of potential diagnoses. In this case, the correct diagnosis was made based on the patient's systemic complaints, but might have been made sooner if her TMD symptoms had been evaluated differently.

Several points should have raised suspicion. First, the patient had no prior history of TMD symptoms to suggest that her pain and swelling were the extension of a pre-existing condition. Second, TMD's, whether based in muscle, joint, or both, are not known to cause the firm, almost hard facial swelling seen in the present

case. Finally, a more thorough examination of the panoramic radiograph could have revealed the cortical defect and loss of trabecular density in the right condyle, both highly suspicious indications of a serious condition.

However rare, if an entity like malignancy is missing from the differential diagnosis, it is unlikely to receive serious consideration in discussions with the patient and subsequent evaluation and treatment planning. This was particularly true in the present case, where the patient initially responded well to conservative TMD management. Radiographic evidence of bone destruction was overlooked because it was obscured in a dark portion of the panoramic radiograph. Radiographs should be examined in a systemic fashion using adequate light and magnification, if needed.



Finally, it appears that too much significance was attached to behavioral and psychosocial factors. While these factors are fundamental to patient assessment, they must be weighed in the context of the entire patient. Here, the patient was worried about finances and her husband's health and was clenching and chewing gum. Without fully appreciating the potential significance of the acute onset of firm facial swelling, these factors were deemed adequate to interpret this patient's signs and symptoms as a disc displacement with capsular injury and to not insist on an MRI, which would have led to the proper diagnosis.

About 12 months after the above patient was seen, another middle-aged female patient was referred for TMD evaluation because she had a firm, 3-4 cm diameter swelling over her right masseter. While taking her history, she mentioned that she had been recently diagnosed with lung cancer. Her RDC examination was essentially normal, and she was referred

back to the oncologist for treatment. He later reported that her facial swelling responded to chemotherapy. A third patient in her 60's who had already been diagnosed with T-cell lymphoma had also been seen. Although her RDC-TMD exam was positive, she also had submandibular lymphadenopathy. In this case, a

malignancy with head and neck signs presented with co-morbid TMD. The patient died of her lymphoma within a few months. Head and neck malignancy has the potential to mimic or co-exist with TMD's and must always be considered as a possibility when signs and symptoms of the latter are atypical.

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## About the Authors

*Note: Bio information was provided at the time the case challenge was developed.*

### Peter F. van der Ven, DMD, PhD



Dr. van der Ven is an auxiliary member of the Department of Oral Medicine faculty at the University of Washington. He is a graduate of Harvard School of Dental Medicine and completed a residency in Hospital Dentistry at the University of Oregon Health Sciences Center. He also served as a Dental Staff Fellow at the National Institutes of Health and as a Fulbright junior scholar in the Netherlands. Dr. van der Ven received a certificate in Oral Medicine and a PhD in Oral Biology from the University of Washington. He is board certified in Oral Medicine. He is also in private practice at the South Sound Oral Medicine Clinic in Federal Way, WA.

E-mail: pven@u.washington.edu

### Jeffrey A. Burgess, DDS, MSD



Dr. Burgess received his dental degree as well as a certificate and Masters in Oral Medicine from the University of Washington School of Dentistry. He was awarded an Individual National Research Service Award from the National Institute of Neurological and Communicative Disorders and Stroke in 1985 and served as Senior Research Fellow with the Department of Anesthesiology at the University of Washington Multidisciplinary Pain Center through 1987. He is currently an Attending at the University of Washington Medical Center Pain Center and Assistant Clinical Professor in the Department of Oral Medicine. He is also in private practice at the South Sound Oral Medicine Clinic in Federal Way, WA. He has published several articles and authored or co-authored seven medical and one dental textbook chapter(s) on orofacial pain and related topics.

### Lars G. Hollender, DDS, PhD



Dr. Hollender is a Professor in the Department of Oral Medicine and serves as the Director of the Oral Radiology Division in the School of Dentistry at the University of Washington. He received his dental degree from the Royal Dental School in Malmo, Sweden.

Dr. Hollender is a certified specialist in Oral and Maxillofacial Radiology in Sweden and is also a Diplomate of the American Board of Oral Maxillofacial Radiology. He has published over 100 articles and several chapters in textbooks. He was awarded the research prize of the South Swedish Dental Association and the annual research prize of the Swedish Dental Association in 1965. In 1976 Dr. Hollender received the Elander research prize. He is an honorary member of the International Association for Dentomaxillofacial Radiology and of the Australian Academy of Dentomaxillofacial Radiology as well as a fellow of the latter.