Synovial chondromatosis of the temporomandibular joint with extension to the middle cranial fossa

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ABSTRACT
A rare case of synovial chondromatosis with extension to the middle cranial fossa is reported. Synovial chondromatosis, a benign disorder characterized by multiple cartilaginous, free-floating nodules that originate from the synovial membrane is not exclusive to the temporomandibular joint (TMJ). This condition is commonly seen in the axial skeleton and can involve multiple joints. In this case, synovial chondromatosis of the TMJ led to complete bony erosion of the glenoid fossa extending into the middle cranial fossa. Although plain radiographs showed the involvement of the joint, Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) provided more detailed information about the lesion in all three dimensions. This case demonstrates the value of CT and MRI in both the diagnosis and treatment planning. A review of previously reported cases of synovial chondromatosis with cranial extensions is included.

KEY WORDS: Synovial chondrometaplasia, Osteochondromatosis, Temporomandibular joint, Intracranial extension

MR images of the TMJs were acquired suspecting an aggressive lesion localized to the TMJ. Detailed information about the joint involvement including the erosion and perforation of the glenoid fossa was obtained from the CT and MR studies.

Axial and coronal CT images both in bone and soft tissue windows showed an expansile but localized lesion in the area of the right TMJ. Multiple, separate, unevenly dispersed small radiopacities were found within the vicinity of the head of the condyle. The condylar head by itself was missing in toto. The CT images confirmed the perforation of the glenoid fossa and the lesion extending into the middle cranial fossa. These findings were suggestive of a locally aggressive, benign

Case History
A 65-year-old Caucasian woman initially presented to her general dentist with a chief complaint that “her bite was changing”. Over an eighteen-month period, she had developed premature contact in the left posterior dentition and an open bite on the right side [Figure 1]. She was referred to the Oral and Maxillofacial surgery service at the Hospital of the University of Pennsylvania. A panoramic radiograph taken by her dentist, showed the absence of the right condyle of the mandible with substantially increased joint space compared to the left side. CT [Figure 2], T1 weighted and T2 weighted [Figure 3]
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Discussion

Although most authors are now in agreement that the term synovial chondromatosis best describes the condition, it has been reported under various names such as synovial osteochondromatosis, synovial chondrometaplasia, synovial chondrosis, and periarticular tenosynovial chondrometaplasia. Synovial chondromatosis of the TMJ occurs over a wide age range, but most affected patients are middle-aged. SC more commonly affects larger joints such as the knee, elbow or hip. SC affecting the limb joints is more common in males (Males: Females = 4:1) whereas SC of the TMJ is more common in females. Preauricular swelling, pain, and limitation of joint movements are usually noticed in SC. These features are common to a number of conditions involving the TMJ and are not diagnostic indicators for SC alone. TMJ clicking, locking, crepitus, and occlusal changes are common to SC and many degenerative joint disorders. SC usually occurs unilaterally. The extension of the lesion from the joint capsule and the involvement of the surrounding tissues may make the diagnosis difficult, causing SC to be confused with parotid, middle ear or intracranial tumors. Intracranial extension may lead to neurological deficits such as facial nerve paralysis.

Radiographically, the osseous components may appear normal or may exhibit osseous changes similar to those in osteoarthritis on plain films and/or panoramic radiographs. The most common plain films that are prescribed for this condition are the bilateral lateral oblique views, transcranial or transpharyngeal views of the mandible and TMJ. The condition may manifest as a widened joint space, irregularity of joint surfaces, limitation of the range of motion, presence of calcified loose bodies (joint mice), and sclerosis or hyperostosis of the glenoid fossa and irregularity of the condylar head. A radiopaque mass or several radiopaque loose bodies may be seen surrounding the condylar head. The absence of radiopaque loose bodies on radiographs does not preclude the diagnosis of SC, since the appearance of the loose bodies varies with the degree of calcification of the cartilaginous nodules. Conventional radiography may not lead to the diagnosis, due to the superimposition of cranial bones that may obscure the calcified loose bodies.

CT and MRI have been advocated as more specific diagnostic imaging procedures. If SC is suspected after clinical and plain radiographic evaluation, a CT scan should be obtained. The lesion may appear as a single mass or as multiple loose hyperdense bodies in axial, coronal or sagittal scans. The reported CT findings in SC of TMJ are increased soft tissue density in the joint with multiple, small calcified areas with peripheral calcification and erosion of surrounding bony structures. CT imaging can identify the location of the calcifications. Occasionally erosion through the glenoid fossa into the middle cranial fossa may occur, which is best detected with CT and MR imaging as had happened in this case. MRI may show distension of lateral capsule of the joint and presence of fluid in the joint. T2 weighted MR images will show the fluid accumulation by way of the intense bright signal from the area.
of the lesion with embedded areas of void signal representing calcified bits of cartilage. Arthroscopy may be necessary for accurate diagnosis, particularly when the loose bodies are not calcified and cannot be visualized by conventional radiology or CT.[7] Differential diagnosis of loose bodies in a joint includes SC, degenerative joint disease (DJD), rheumatoid arthritis, tuberculous arthritis, osteochondral fracture, chondrosarcoma, osteochondritis desicans, villonodular synovitis, chronic renal failure, calcium pyrophosphate deposition disease, primary tumours of bone or cartilage and chondrocalcinosis.[1,6,7] The radiographic appearance of chondrocalcinosis may simulate SC. Often the radiopacities within the joint space are finer and have more even distribution than in SC.[4] Either arthroscopic or open biopsy and histopathology then will confirm the diagnosis.

Milgram classified SC into three developmental stages based on the presence or absence of detached particles.[8] A review of pertinent literature has shown that the intracranial extension of SC has been reported only about 11 times previously in the literature.[9,10] It is sometimes difficult to distinguish between TMJ and parotid pathologies, even with adequate clinical examination and radiographs. This distinction is often possible if ⁹⁹ᵐ Tc bone scans, CT, CT sialograms or MR images are obtained.[1,11] CT and arthroscopy have revealed cases of SC that previously would have been diagnosed as other conditions. Extension of SC from the TMJ joint to the surrounding tissues (including the parotid gland, middle ear, or middle cranial fossa) may occur. Recently, a simultaneous occurrence of TMJ SC and a pleomorphic adenoma of the parotid gland in the same patient has been reported.[12]

In conclusion, any patient presenting with preauricular swelling, pain, restriction of TMJ movements and altered dental occlusion should be evaluated with plain radiography, CT scan and if necessary MRI. Arthroscopy and / or open surgery and histopathology would confirm SC.

References