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內文：

Abstract : Osteonecrosis of the mandibular condyle is a rare condition characterized by a primary subchondral osseous breakdown of the condyle with secondary articular surface collapse. Despite these characteristics, it has proved to be difficult to diagnose. The present case of osteonecrosis of the mandibular condyle was initially diagnosed more than 2 years before. **The diagnosis at that time was based on physical examination, plain film radiography, cone-beam computerized tomography, magnetic resonance imaging, and total body scintigraphy.** The disease had progressed into severe osteoarthritis at a 2-year follow-up using cone-beam computerized tomography. **This report suggests that osteonecrosis may be a precursor of osteoarthritis, and cone-beam computerized tomography may provide a sensitive radiographic technique for the diagnosis of osteonecrosis of mandibular condyle.**

- **Osteonecrosis has also been called avascular necrosis (AVN), ischemic necrosis, and aseptic necrosis. It was defined as necrosis of epiphysial or subarticular bone secondary to a diminished or disrupted blood supply in the absence of infection.**
- Most cases of AVN have been found to involve the femoral head and the hip joint. Less common sites are the head of humerus, patella, and lower thoracic vertebrae.² The temporomandibular joint (TMJ) has been rarely affected by the disease
- It has been difficult to make an early diagnosis of AVN of the mandibular condyle
- Magnetic resonance imaging (MRI) has been established as a technique for the diagnosis of early AVN
- Focal, subarticular, and/or generalized condylar lesions with decreased first-echo marrow signal and either decreased, variable, or increased T2 signal, with or without morphologic alterations, were considered to be suspicious for AVN
- However, the most reliable MRI signal pattern for AVN was a combination of both edema and sclerosis, giving an appearance of the characteristic “double-line” sign not often found in the mandibular condyle
- **Avascular necrosis may lead to severe pain along with the development of bone fragility, collapse of the articular surface, and degenerative changes of the TMJ in later stages.**
- The early findings of osteonecrosis of the mandibular condyle and later progression into severe osteoarthritis at 2-year follow-up were clearly presented using CBCT.
- The etiology of AVN and CBCT possibly being a sensitive radiographic technique for early diagnosis of osteonecrosis of mandibular condyle are discussed

Case report

CC : A 68-year-old woman presented to the Center for Temporomandibular Disorders and Orofacial Pain in June 2006, complaining of pain in her left TMJ. She described the pain as a mild aching pain that was aggravated by jaw movement.

PMH : Osteoporosis and an arthroscopic surgery 7 years previously due to primary knee osteoarthritis. She did not have a history of trauma, previous TMJ surgery, or previous steroid injection into the TMJ

OE : MMO= 40 mm, Jaw opening was associated with crepitus on condylar translation, mild tenderness on palpation were found in the areas of both the left temporal and the masseter muscles. Moderate tenderness was found in the left joint area. The head and neck examination revealed no evidence of adenopathy, paresthesia, or motor nerve deficiency

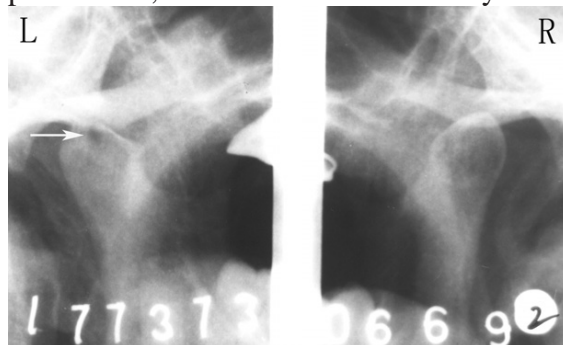


Fig. 1. Transpharyngeal radiograph. A subcortical radiolucent lesion (*arrow*) was found to be located within the left condyle.

- After scanning the TMJ, serial images (1 mm thick) of the condyle were sagittally and coronally reconstructed. We selected 4 coronal images (1.5 mm gap) from posterior section to anterior section, e.g. Fig. 2, A-D

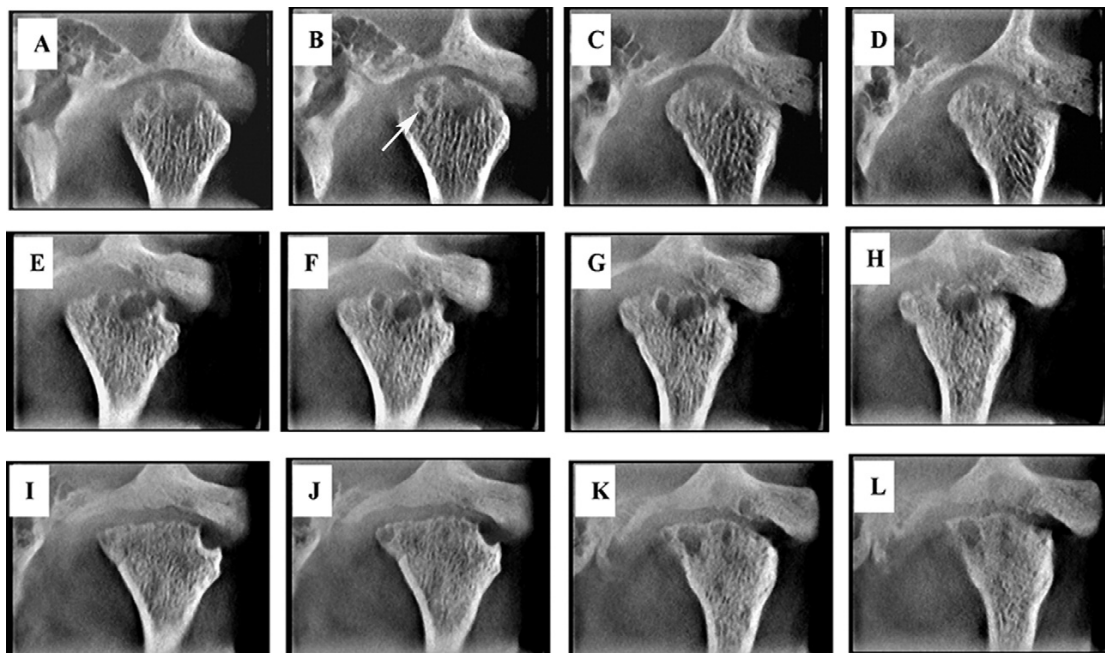


Fig. 2. Cone-beam computerized tomography (CBCT) images of the left condyle. A-D, The first CBCT was in June 2006 and showed 2 cyst-like radiolucent lesions with the discontinuance of the articular surface, 1 cyst surrounded by a sclerostic rim

(B, arrow); E-H, The second CBCT in April 2007 showed the articular surface collapsed and loss of vertical dimension in the condylar head, the opposing glenoid fossa having the same osteoarthritic changes. I-L, The third time CBCT in April 2008 showed the appearance of severe osteoarthrosis; the condyle was obviously deformed and had lost vertical dimension, but a new cortical articular surface appeared to have formed and the density of the subchondral bone had increased, indicating a repair process

- An MRI study was then performed: Proton density and T2 weighted images were formatted in oblique sagittal planes in both the closed- and the open-mouth positions
- **A diagnosis of anterior disc displacement without reduction associated with the left TMJ was made (Fig. 3, A and B).**

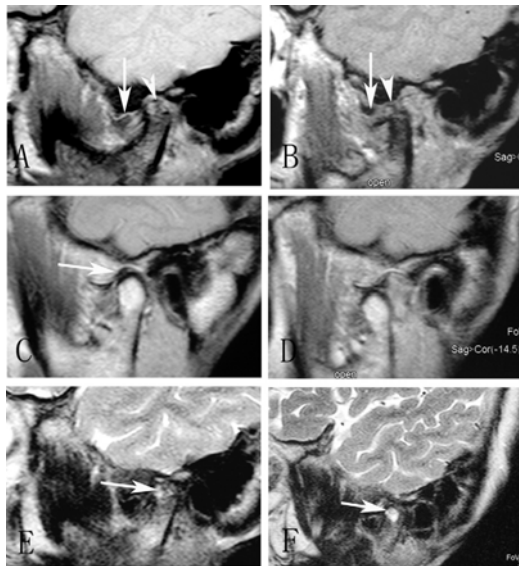


Fig. 3. A, proton density weighted image in the closed-mouth position revealed anterior disc displacement (arrow) in the left side, and the subchondral region showed intermediate signal intensity mixed with a low-signal band (arrowhead). B, The displaced disc (arrow) was not reduced on the open-mouth position, and the subchondral region showed intermediate signal intensity surrounded by a low-signal band (arrowhead). C, D, Proton density-weighted image from the right side showing the normal disc position (arrow) and the condylar contour, in both the closed (C) and open (D) mouth positions. E, F,

T2-weighted images of the left condyle, showing the focal subchondral high signal mixed with a low-signal band (E, arrow), and a significantly high signal of the bone marrow lesion (F, arrow).

- The focal subchondral region showed intermediate signal intensity on proton density-weighted and high signal on T2-weighted images mixed with or surrounded by a low signal band, an appearance of osteonecrosis (Fig. 3, A, B, and E)
- **Impression : Based on all of the information obtained and MRI diagnostic criteria described by Schellhas et al, a diagnosis of osteonecrosis of the left mandibular condyle was made**
- Tx : The patient was prescribed nonsteroidal antiinflammatory drugs and glucosamine sulfate for joint pain control and treatment, and was asked to return regularly for evaluation
- Since early 2007, the patient had received calcitonin injections and oral calcitriol for the treatment of osteoporosis

Discussion :

- The etiology of AVN is currently unknown. It is thought to be the result of ischemia that in turn may be related to direct blood vessel injury (post-traumatic necrosis), intraluminal obliteration (vasculopathy), or extraluminal obliteration in the bone marrow.
- AVN has been reported to rarely affect the mandibular condyle and was considered to be unlikely owing to the vigorous blood supply to the mandibular

- ramus and condyle. However, with the application of advanced diagnostic techniques, it has been learned that the disease might be a relatively common disorder that was generally not recognized
- These studies on TMJ have focused on bone marrow alterations (edema, osteonecrosis) in the mandibular condyle and investigated the relationships among age, joint pain, effusion, and bone marrow alterations
 - Most of them stated that bone marrow edema is closely related to internal derangement, osteoarthritis and effusion
 - **This finding is consistent with the suggestion that internal derangement might be a risk factor of AVN in the mandibular condyle.**
 - Osteoarthritis of TMJ is a common, primarily noninflammatory, joint disease characterized by a deterioration of the articular surfaces and simultaneous remodeling of the underlying bone
 - On the other hand, subchondral cyst-like change is a rare finding in osteoarthritis, but it is one of the histologic criteria for osteonecrosis. The MRI findings and radionuclide imaging further supported the initial diagnosis of osteonecrosis
 - **The subsequent appearance of degenerative changes in the fossa in the case led to the diagnosis of secondary osteoarthritis arising after osteonecrosis**
 - Osteonecrosis is a primary bone problem that results in radiographic sclerosis and lucency, and then in collapse of the articular surface, causing the loss of its normal contour. In the present case, **coronal CBCT images demonstrated small radiolucent lesions with a sclerotic rim before the articular surface collapsed, suggesting that CBCT may provide a sensitive radiographic technique for the diagnosis of AVN.**

題號	題目
1	<p>以下關於下顎運動功能障礙的描述，何者錯誤？</p> <p>(A) 顳顎關節內部紊亂(internal derangement)是可能的原因之一</p> <p>(B) 關節疼痛是可能的病因之一</p> <p>(C) 肌肉問題很少造成運動功能障礙</p> <p>(D) 顳顎關節的被動運動(passive movement)對下顎運動功能障礙病因的診斷有幫助</p>
答案(C)	出處：occlusion, Ash and Ramfjord 4e 中譯本
題號	題目
2	<p>臨床上，顳顎關節之類風濕性關節炎(Rheumatoid arthritis)與退化性關節疾病(degenerative joint disease)有那些不同特徵：</p> <p>(1) 前者所引起的顳顎關節症狀常在較年輕時就出現</p> <p>(2) 後者之症狀常同時出現於兩側而前者為單側</p> <p>(A) 只有(1)正確</p> <p>(B) 只有(2)正確</p> <p>(C) (1)(2)均正確</p> <p>(D) (1)(2)均不正確</p>
答案(A)	出處：Contemporary Oral and Maxillofacial Surgery 4 th edition P681