

# Synovial Chondromatosis in Temporomandibular Joint

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Synovial chondromatosis (SC) in temporomandibular joint is a rare benign disorder characterized by cartilaginous metaplasia of the mesenchymal remnants of the synovial tissue. The etiology of the disease is unclear but may be associated with trauma, overuse, local infection, and embryologic disturbance. SC does not spontaneously resolve and respond to nonsurgical treatment. SC should be differentially diagnosed with other temporomandibular joint disorders such as arthralgia or osteoarthritis because surgery should be done for managing it. However, primary diagnosis of SC is not easy because of nonspecific symptoms and signs. For the patients with unsuccessful conservative treatment response, especially accompanied by crepitus, preauricular swelling or posterior open bite, computed tomography/cone-beam computed tomography or magnetic resonance imaging should be performed to exclude SC. We discussed the importance of the early diagnosis and surgical treatment of SC from this case.

**Key Words:** Arthroscopy; Chondromatosis, synovial; Joint loose bodies; Malocclusion; Maxillofacial surgery; Temporomandibular joint

## INTRODUCTION

Synovial chondromatosis (SC) in temporomandibular joint (TMJ) is a rare benign disorder characterized by cartilaginous metaplasia of the mesenchymal remnants of the synovial tissue.<sup>1)</sup> It is usually confined to the joint space, mainly the superior joint space, but it can occasionally extend beyond the joint capsule into the cranium, parotid gland, infratemporal fossa, or external auditory meatus.<sup>2)</sup> The etiology of the disease is unclear; the development of these pathologies may be associated with trauma, overuse, local infection, and embryologic disturbance.<sup>2)</sup>

The American Academy of Orofacial Pain has published the diagnostic criteria for SC.<sup>1)</sup>

First of all, the patient has the history of at least one of the following: (1) report of preauricular swelling, (2) arthralgia, (3) progressive limitation in mouth opening, and (4) joint noise in the past month.

In addition, at least one of the following must be proved by examination: (1) preauricular swelling, (2) arthralgia, (3) maximum assisted opening (passive stretch) less than 40

mm, including the vertical incisal overlap, and (4) crepitus.

Clinical diagnosis is made mainly based on imaging such as the following: (1) magnetic resonance imaging (MRI): multiple chondroid nodules, joint effusion, and amorphous iso-intensity signal tissues within the joint space and capsule, (2) computed tomography (CT)/cone-beam CT (CBCT): loose calcified bodies in the soft tissues of the TMJ.

Histologic examination confirming cartilaginous metaplasia makes the definitive diagnosis of SC.

The disease may be related to malocclusion; progressive ipsilateral posterior open bite.<sup>1)</sup> In the cases with intracranial invasion, headache can be often complained.<sup>2)</sup> Small cartilaginous nodules with lack of calcification or ossification are easy to be overlooked on CT.<sup>2)</sup>

## CASE REPORT

A 48-year-old female presented with pain on the left preauricular area when chewing. She had been experiencing crepitus sound and pain on the left TMJ region for about 1 year, and had no specific medical history except for being a

hepatitis B carrier.

She reported pain on the left TMJ during active mouth opening (50 mm), laterotrusive movement (5 mm) and protrusive movement (7 mm). Physical examination revealed tenderness to palpation on the left TMJ and masseter, and both sternocleidomastoid (SCM), trapezius, and splenius capitis muscles. The occlusion was stable on the both side evenly and the sound of the TMJ was not detected at the clinical examination. There were no significant pathologic bony change on the panoramic and transcranial radiographic view (Figs. 1, 2). She was diagnosed with arthralgia



Fig. 1. The panoramic radiography at first visit.

on the left TMJ and myofascial pain on the left masseter and both SCM, trapezius, and splenius capitis muscles. The patient was instructed precautions for temporomandibular disorder and treated with pharmacologic and physical therapy. After 2 months, the pain disappeared and then treatment was finished.

One year and a half later, she revisited for the same complaint. She said that the pain had recurred 6 months after the end of treatment and splint therapy, conducted at a local clinic, had failed due to discomfort associated with wearing the appliance.

Active mouth opening was 45 mm and she presented with pain on her left TMJ during opening and eccentric movement. Tenderness was observed when palpating on both TMJ, masseter, SCM, trapezius, and splenius capitis muscles. The occlusion remained unchanged, but crepitus sound was detected on the left TMJ. CBCT was taken, and sagittal and frontal images showed bony flattening of the superior portions of the both condyle heads and small high attenuated bony materials around the left condyle (Fig. 3). As the result, a presumptive radiological diagnosis was made as SC.

After 8 weeks of pharmacologic and physical treatments,

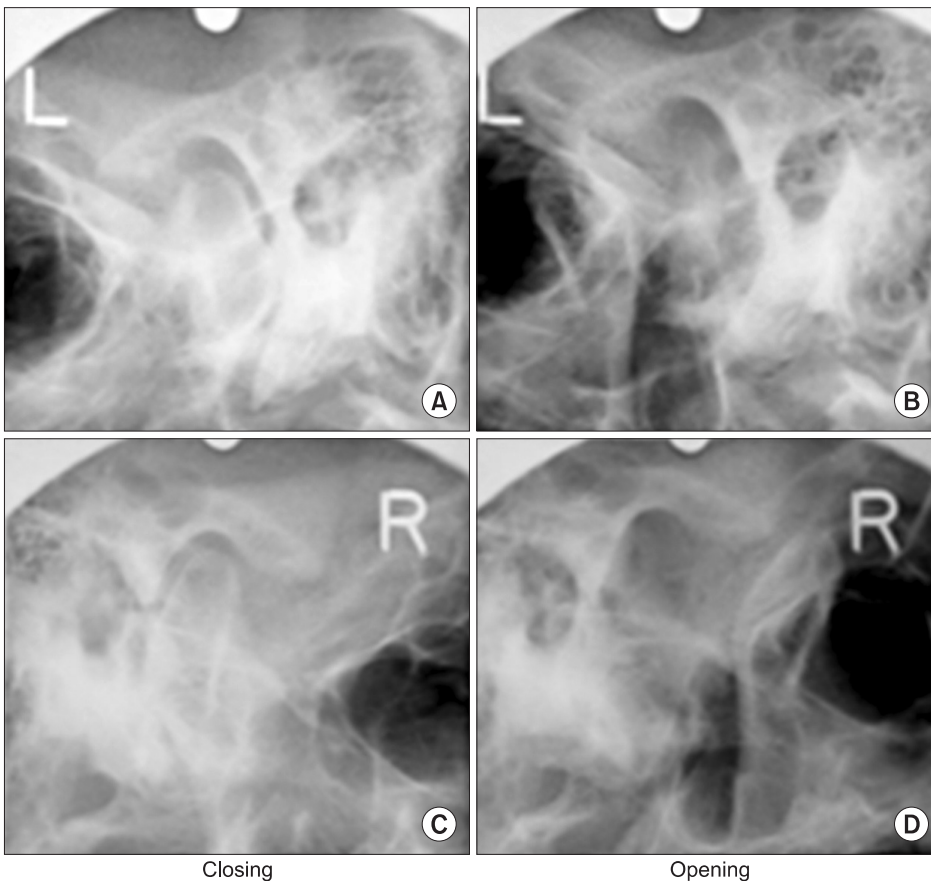
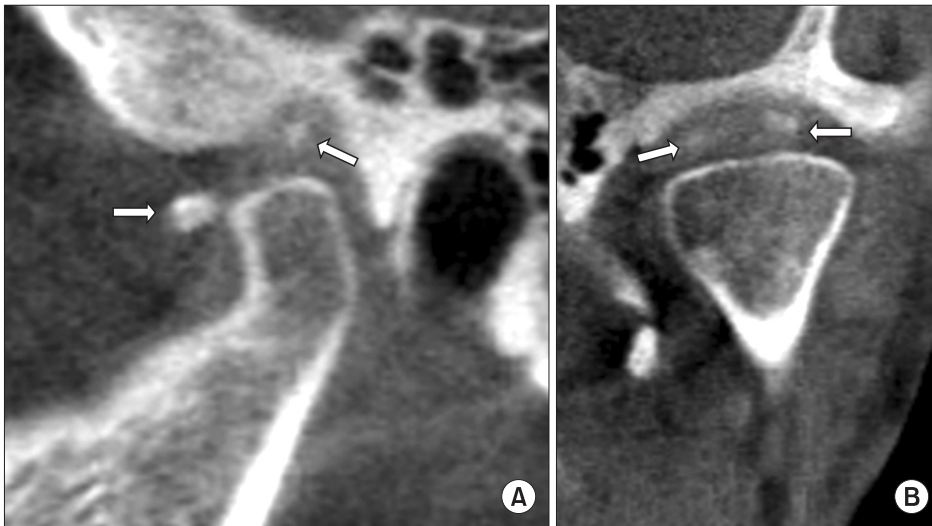


Fig. 2. Transcranial radiography at first visit. (A) Closing, left temporomandibular joint (TMJ), (B) opening, left TMJ, (C) closing, right TMJ, (D) opening, right TMJ.



**Fig. 3.** Cone-beam computed tomographic images after 1 year and a half. (A) Sagittal view, (B) coronal view. Bony flattening of the superior portions of the both condyle heads and small high attenuated bony materials (arrows) around the left condyle were shown.

the patient complained of occlusion change, and clinical examination identified light contacts of the left second premolar, and first and second molars. The patient's signs and symptom repeated waxing and waning during conservative treatment including occlusal stabilization splint therapy.

The patient underwent follow-up CBCT 1 year later, and no significant change was observed.

Surgical removal of the mass via a preauricular approach was performed under general anesthesia at the department of oral and maxillofacial surgery 1 year and 10 months later since her revisitation. Histopathological assessment confirmed SC. After the surgery, subjective pain and joint noise improved, but anterior openbite was observed, likely resulting from degenerative joint disease.

So far, the occlusion has been recovering without pain recurrence.

## DISCUSSION

SC is a benign disease, but does not spontaneously resolve nor respond to nonsurgical treatment.<sup>2-5)</sup> Furthermore, it has potential to invade the intracranial structure and recur.<sup>2,4)</sup> Therefore, surgical intervention is needed as following.

Arthroscopy is less invasive technique that is useful for the primary treatment of small loose bodies less than 3 mm, confined to the superior joint space.<sup>2,6)</sup> Success rate is no better than 55%.<sup>3)</sup> Arthroscopy has limitation and difficulty to retrieve the larger intra-articular loose bodies completely.<sup>2,6)</sup>

Open TMJ surgery is recommended as the therapy of choice for SC.<sup>3,7)</sup> It removes loose bodies greater than 3 mm.<sup>3)</sup> Additional procedure, such as synovectomy which removes affected active synovial membrane with synovial metaplastic activity is performed most frequently. It is often accompanied by discectomy, and, less frequently, by condylectomy.<sup>7)</sup>

Postoperative follow-up examination is suggested initially at 3-6 month intervals in the first year, and later once per year.<sup>2,4)</sup> Once the loose bodies have been removed, the recurrence rate seems to be very low.<sup>7)</sup>

Primary diagnosis of SC is not easy because of low incidence in TMJ and nonspecific symptoms and signs. SC should be differentially diagnosed with other TMJ disorders such as arthralgia or osteoarthritis because surgery should be done for managing it. It must be suspected if the patient reports preauricular swelling, crepitus or posterior openbite or the symptom is not relieved and progressive despite appropriate conservative treatment. It may not be detected by conventional X-rays in the case of lack of calcification or ossification.

In this case, the patient revisited for the recurrence of the same symptom. If a CT scan had been conducted at the first visit, diagnosis for SC would have been made earlier. In addition, surgical approach should have been considered right after the clinical diagnosis of SC.

In conclusion, for the patients with unsuccessful conservative treatment response, especially accompanied by crepitus, preauricular swelling or posterior open bite, CT/CBCT or MRI should be performed to exclude SC. MRI may be

useful for detecting the nodules in the early stages of formation, before ossification.<sup>7)</sup> For the treatment of SC which is needed surgical intervention, early diagnosis is important to promote adequate therapy and improve the prognosis.

### CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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