



# Synovial Chondromatosis of the Temporomandibular Joint Diagnosed by Magnetic Resonance Imaging: A Case Report

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Synovial chondromatosis is a rare benign joint condition characterized by the development of metaplastic cartilaginous nodules in the synovium. It primarily affects large joints, such as the knees, elbows, hips, and shoulders, and is uncommon in the temporomandibular joint (TMJ). Symptoms may include swelling in the preauricular area, pain, crepitus (crackling or grating sounds), and limited joint movement. However, these symptoms are also observed in other TMJ disorders, making it important to differentiate synovial chondromatosis from other TMJ disorders. We present a case of synovial chondromatosis that was not detected on cone-beam computed tomography but was successfully identified using magnetic resonance imaging.

**Keywords:** Chondromatosis, synovial; Joint loose bodies; Magnetic resonance imaging; Temporomandibular joint

## INTRODUCTION

Synovial chondromatosis is a rare benign joint disorder in which metaplastic cartilaginous nodules develop within the synovial membrane of the joint [1]. Its occurrence in the temporomandibular joint (TMJ) is extremely rare, accounting for less than 3% of all cases of synovial chondromatosis [2]. The disease progresses through three pathological stages: in stage 1, chondrometaplasia is confined to the synovium; in stage 2, there is a mixture of loose bodies within the synovium and the joint cavity; and in stage 3, the synovial lesions disappear, and multiple loose bodies are present within the joint cavity [3]. Over time, these loose bodies may undergo calcification or ossification, with calcification occurring in approximately 70%-95% of cases [4]. However, in the early stages, where calcification is not apparent, there are limitations in detecting lesions using simple radiography or computed tomography (CT) [5]. Clinically, symptoms

such as preauricular swelling, pain, crepitus, and limited joint movement are observed [6]. However, these symptoms are similar to those of various TMJ diseases, such as osteoarthritis and rheumatoid arthritis, making differential diagnosis essential. In particular, synovial chondromatosis of the TMJ may be asymptomatic or present with only mild symptoms and can often be found incidentally on imaging studies. CT or cone-beam computed tomography (CBCT) is useful for detecting calcified loose bodies but has low sensitivity for noncalcified lesions. In contrast, magnetic resonance imaging (MRI) is excellent for evaluating soft tissue lesions, and synovial chondromatosis can be diagnosed by observing multiple low-signal nodules on T2-weighted images [7]. This case report discusses a patient with TMJ synovial chondromatosis in whom no lesions were observed on CBCT, but the diagnosis was made via MRI, and surgical treatment was performed. These findings highlight the importance of clinical diagnosis and treatment strategies. This

study followed the guidelines of the Declaration of Helsinki, and was approved by the Institutional Review Board (IRB) of Yonsei University Dental Hospital (IRB No. 2-2025-0073). The requirement for written informed consent was waived by the committee.

## CASE REPORT

A 64-year-old woman visited the Department of Orofacial Pain and Oral Medicine complaining of pain beneath her left ear that had started approximately five months prior. There was no spontaneous pain, but the patient complained of sharp, tingling pain lasting 1-2 minutes with a numerical rating scale (NRS) score of 4 when opening the mouth or yawning, 6 when chewing on the right side, and 2 when swallowing saliva. At the initial visit, her maximum active mouth opening was 50 mm, and pain was elicited in the left TMJ when she opened her mouth wide. The range of protrusive movement was 5 mm and was accompanied by pain in the left mandibular angle. The range of right and left lateral movements was 6 mm and 8 mm, respectively, both accompanied by pain in the left TMJ. Palpation revealed mild

tenderness in the left TMJ. Full-arch contact was observed in the centric occlusion position. She reported nighttime teeth grinding as a parafunctional habit. After the onset of symptoms, the patient visited a dental clinic, where only an examination was performed. Medication was prescribed at an otolaryngology clinic, but it did not improve the patient's symptoms. The patient also received medication from the oral and maxillofacial surgery department at another hospital, but it was ineffective. In terms of past medical history, the patient was taking medication for hyperlipidemia and hypothyroidism and had cervical disc disorder. The patient's dental history was unremarkable.

No specific findings were observed in the panoramic examination and TMJ mode panoramic images taken at the first visit (Fig. 1). The patient was diagnosed with left TMJ arthralgia, and CBCT of the TMJ was performed to rule out TMJ osteoarthritis; however, no specific pathological findings were observed in the TMJ area (Fig. 2, 3). At the first visit, aceclofenac (Airtal; Daewoong Pharmaceutical Co., Ltd.) 100 mg, eperisone hydrochloride (Nerexone SR; Daewoong Pharmaceutical Co., Ltd.) 75 mg, and rebamipide (Mucosta SR; Korea Otsuka Pharmaceutical Co., Ltd.)

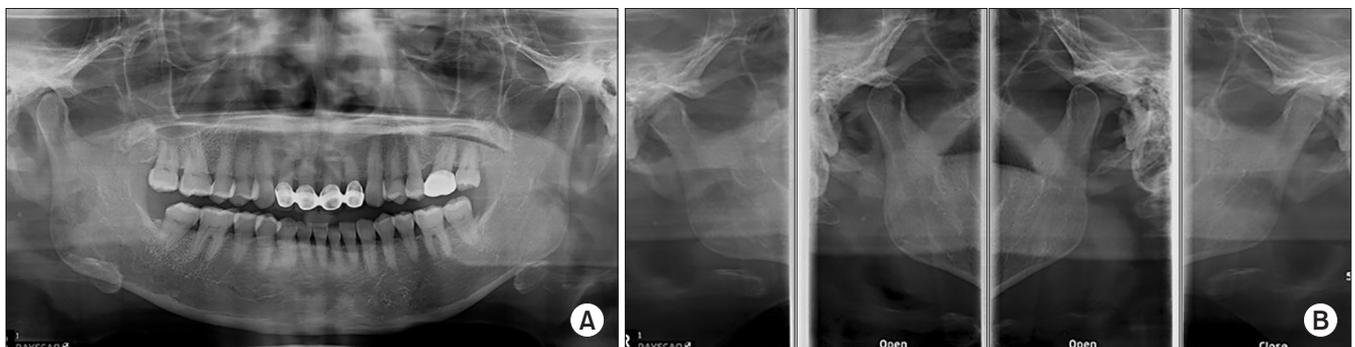


Fig. 1. Panoramic radiographs at the initial visit. (A) The standard panoramic view and (B) the temporomandibular joint mode view revealed no pathological findings.

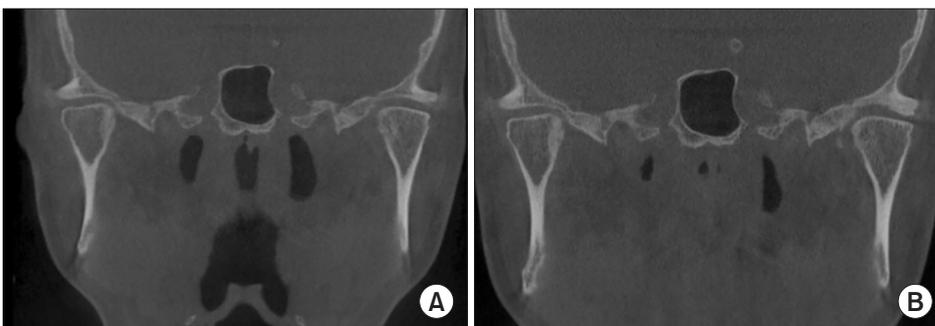


Fig. 2. Coronal view of the left temporomandibular joint cone-beam computed tomography scan showing no pathological findings at different time points. (A) Initial visit, (B) revisit after 1 year and 8 months.

150 mg were prescribed to be taken twice daily for two weeks. Physical therapy, including iontophoresis and ultrasound, was performed, and the patient was instructed on self-care methods, including precautions, moist hot pack, and stretching. At the second visit, the patient reported no improvement in pain; therefore 500 mg of nabumetone

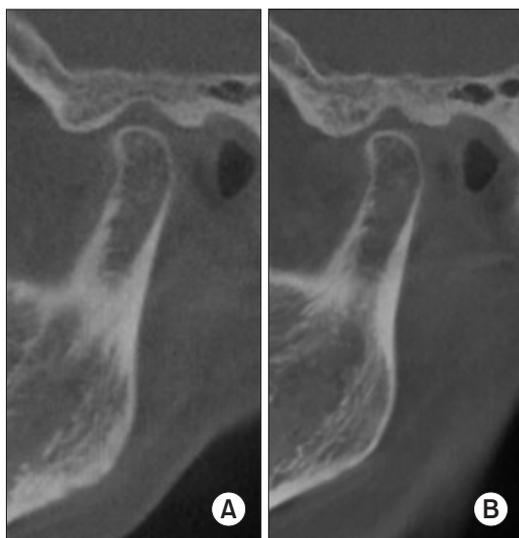


Fig. 3. Sagittal view of the left temporomandibular joint cone-beam computed tomography scan showing no pathological findings at different time points. (A) Initial visit, (B) revisit after 1 year and 8 months.

(Relafen; Handok Inc.) was prescribed to be taken twice daily, and 10 mg of cyclobenzaprine (Cyclpen; Whan In Pharm Co., Ltd.) was prescribed to be taken at bedtime. However, the patient did not return after that.

Approximately 1 year and 8 months after the initial visit, the patient returned with similar symptoms. The patient reported sharp pain of NRS 6 during mouth opening and chewing, as well as pain triggered when swallowing, speaking, or moving the jaw. Clinical examination revealed a reduced maximum active mouth opening of 41 mm, protrusive movement of 5 mm, right lateral movement of 3 mm, and left lateral movement of 7 mm, all of which elicited left TMJ pain. The occlusion maintained full contact of all teeth in centric occlusion. The TMJ CBCT was performed again; however, no pathological findings were observed. Due to the persistent and recurring nature of the symptoms and the negative findings on CBCT, MRI of the TMJ was performed to investigate soft tissue pathology. The disc positions in the open- and closed-mouth images were within the normal range. However, in the left TMJ joint space, multiple low-signal areas suspected to be loose bodies were observed along with T2 high signal, raising the suspicion of synovial chondromatosis (Fig. 4). Therefore, the patient was referred to the Department of Oral and Maxillofacial Surgery for

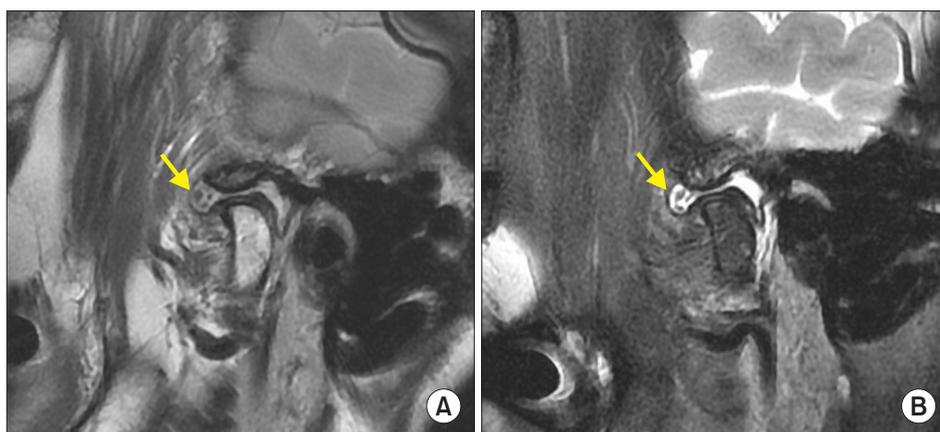


Fig. 4. Magnetic resonance imaging of the left temporomandibular joint (sagittal view). Multiple low-signal areas (indicated by yellow arrow) surrounded by joint effusion. (A) T1 weighted image, (B) T2 weighted image.

Table 1. Clinical outcome and follow-up results

	Pre-op	1 month post-op	4 months post-op	9 months post-op	1 year post-op
MMO (mm)	41	42	46	47	48
Spontaneous pain (NRS)	6	2	3	0	1.5
Pain on mastication (NRS)	7	2.5	3	3	2.5

NRS: pain score, where 0 indicates no pain and 10 indicates the worst imaginable pain. The MMO was measured in mm. op, operation; MMO, maximum mouth opening; NRS, numerical rating scale.

surgical intervention. However, prior to the scheduled surgery, at a follow-up 3 months after the re-visit, the patient's symptoms had progressed, including the new onset of spontaneous pain. At this time, the patient's condition was formally documented as preoperative status: the maximum mouth opening (MMO) was 41 mm, the spontaneous pain score was NRS 6, and the pain on mastication score (NRS) was 7 (Table 1). The patient was prescribed pelubiprofen (Pelubi SR; Daewon Pharm. Co., Ltd.) 45 mg and eperisone hydrochloride (Nerexone SR) 75 mg, to be taken twice a day for 2 weeks, and underwent physical therapy, including iontophoresis and ultrasound. Surgery was performed as a mass excision of the left TMJ, accessed through a preauricular incision. Multiple calcified loose bodies were removed from the joint space. The excised loose bodies comprised



Fig. 5. Multiple hyaline cartilaginous nodules, suggestive of synovial chondromatosis.

approximately 20 multiple tissue fragments, each measuring up to 0.2×0.2 cm (Fig. 5). Histopathological examination of the excised lesion revealed multiple nodules of metaplastic hyaline cartilage with focal areas of calcification and ossification. The chondrocytes were arranged in clusters without significant cytologic atypia, findings consistent with synovial chondromatosis of the TMJ (Fig. 6). Follow-up for one year after surgery showed that the patient's symptoms improved significantly, and no recurrence was observed. The MMO increased from 41 mm to 48 mm, spontaneous pain decreased from NRS 6 to NRS 1.5, and pain on mastication decreased from NRS 7 to NRS 2.5 (Table 1).

## DISCUSSION

Synovial chondromatosis is a rare benign disease characterized by metaplasia of mesenchymal remnants in the synovial tissue of the joints [8]. These nodular cartilaginous masses can be pedunculated or detached from the synovial membrane, existing as loose bodies within the joint space. This disease mainly occurs in individuals in their 40s and is more common in females [9]. The three cardinal signs and symptoms of synovial chondromatosis are preauricular pain, swelling or facial asymmetry, and limited range of motion. Other less frequent symptoms include changes in occlusion, such as ipsilateral posterior open bite, joint sounds, sensory disturbance, and headache [9]. The diagnostic criteria for synovial chondromatosis of the TMJ require that the clinical history, examination findings, and imaging results are consistent with the confirmation of cartilaginous metaplasia on histological examination. The patient must meet at least one of the following criteria in their history: preauricular

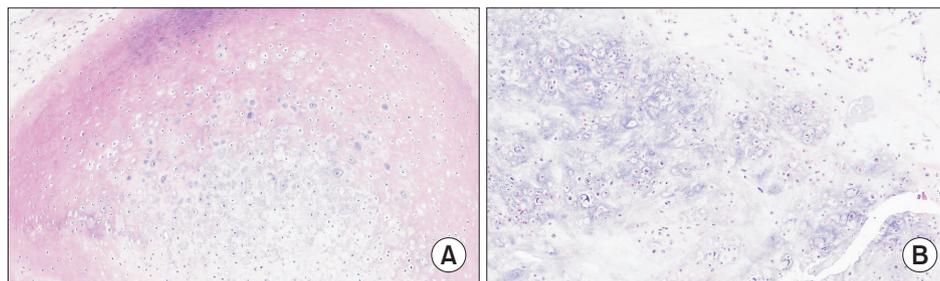


Fig. 6. Histopathologic features of synovial chondromatosis of the temporomandibular joint. (A) Histopathologic view showing a nodule of metaplastic hyaline cartilage. The chondrocytes are arranged in clusters without significant cytologic atypia (hematoxylin & eosin staining [H&E] stain, ×100). (B) Synovial tissue showing focal areas of calcification and endochondrial ossification within the cartilaginous matrix (H&E stain, ×100).

swelling, arthralgia, progressive limitation of mouth opening, or any joint noise in the past month. The examination criteria included preauricular swelling, arthralgia, maximum assisted opening (including vertical overlap of less than 40 mm), and the presence of crepitus, and at least one of these three criteria must be satisfied. For imaging, the diagnosis can be made if any of the following are observed: multiple chondroid nodules, joint effusion, or amorphous tissues with isointensity signal within the joint space and capsule on TMJ MRI, or calcified loose bodies within the soft tissues of the TMJ on CT or CBCT [10]. Synovial chondromatosis can be frequently diagnosed late because of the absence of apparent physical signs and symptoms. The average duration from the onset of symptoms to diagnosis is more than one year [11]. Additionally, synovial chondromatosis is often misdiagnosed as other diseases with similar symptoms, such as TMJ disorders and arthritis [12]. For diagnosis, the patient's history, clinical signs and symptoms, and radiographic findings should be considered. Conventional radiography can reveal joint space widening but may not detect cartilaginous nodules that lack calcifications or ossifications. When cartilaginous bodies are not calcified or are less than 1 mm in size, there is a risk of misdiagnosis with plain radiographs alone [12]. CT is useful for assessing bone destruction at the top of the fossa or invasion of the lesion into the cranial base; however, it may be difficult to detect loose bodies with a low degree of calcification [12]. Current literature highlights the disparity in diagnostic capability between modalities. While CBCT is highly specific for osseous changes, its sensitivity for detecting non-calcified soft tissue pathology is inherently low. In contrast, MRI is considered the gold standard due to its superior soft-tissue resolution. Liu et al. [8] reported that MRI demonstrates a diagnostic accuracy of 96.06% for TMJ synovial chondromatosis, with high sensitivity (80%-100%) for detecting joint effusion and loose bodies, whereas the detection rate on CBCT is significantly lower for non-calcified lesions. In conclusion, CT or MRI is essential for the early diagnosis of TMJ synovial chondromatosis, rather than conventional radiography. MRI is more useful than CT because it can reveal structural changes in the articular capsule or disc, joint effusion, low-grade calcified loose bodies, and invasion of adjacent tissues [13]. Generally, the treatment of choice for

symptomatic synovial chondromatosis is surgical removal. However, surgical intervention is not universally mandatory; asymptomatic cases presenting with calcified loose bodies on imaging can often be managed with long-term observation. Surgical treatment is specifically indicated when clinical signs such as pain or functional limitation are evident. Following surgical intervention, the prognosis is generally excellent. The recurrence rate is considered low; however, incomplete removal of the affected synovial membrane or loose bodies can lead to recurrence [9]. In the present case, despite the lack of calcifications on CBCT, the severe progressive symptoms and unresponsiveness to conservative treatment necessitated surgical intervention. This highlights a critical diagnostic limitation: cartilaginous loose bodies can remain undetected on CBCT. Therefore, to ensure early diagnosis, clinicians should perform a differential diagnosis for conditions such as synovial chondromatosis via MRI when there are clinical symptoms or signs such as posterior open bite or swelling in the premolar region, as well as when CT shows a widened joint space, progressive reduction in mouth opening, or lack of response to conservative treatment.

## CONFLICTS OF INTEREST

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

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None.

## AUTHOR CONTRIBUTIONS

Conceptualization: YS, HJA. Data curation: YS, HJA. Formal analysis: YS, MC, JSK. Methodology: YS, MC, YP, JSK. Visualization: YS. Writing - original draft: YS. Writing - review & editing: MC, JSK.

## REFERENCES

1. Yoon HK, Lee JH, Park SH, Ha JW. Synovial chondromatosis in knee masquerading as tuberculosis arthritis. *J Korean Orthop As-*

- soc 2022;57:83-87.
2. Kim SJ, Kim JH, Kwon JK. Acquired atresia of external auditory canal associated with synovial chondromatosis of the temporomandibular joint. *Korean J Otorhinolaryngol-Head Neck Surg* 2022;65:362-365.
  3. Milgram JW. Synovial osteochondromatosis: a histopathological study of thirty cases. *J Bone Joint Surg Am* 1977;59:792-801.
  4. Yang JH, Jeong SK, Yoon YH. A clinical study of synovial chondromatosis. *J Korean Orthop Assoc* 1989;24:936-941.
  5. Kim ST, Lee SR, Lee BJ, et al. Synovial chondromatosis of the ankle joint and flexor hallucis longus tendon sheath. *J Korean Foot Ankle Soc* 2010;14:173-176.
  6. De Santi Bonatti B, Patrocínio LG, Costa SAA, Costa JMC, Patrocínio JA. Temporomandibular joint synovial chondromatosis. *Rev Bras Otorrinolaringol* 2008;74:480.
  7. Wang P, Tian Z, Yang J, Yu Q. Synovial chondromatosis of the temporomandibular joint: MRI findings with pathological comparison. *Dentomaxillofac Radiol* 2012;41:110-116.
  8. Liu X, Wan S, Shen P, et al. Diagnostic accuracy of synovial chondromatosis of the temporomandibular joint on magnetic resonance imaging. *PLoS One* 2019;14:e0209739.
  9. Guarda-Nardini L, Piccotti F, Ferronato G, Manfredini D. Synovial chondromatosis of the temporomandibular joint: a case description with systematic literature review. *Int J Oral Maxillofac Surg* 2010;39:745-755.
  10. Peck CC, Goulet JP, Lobbezoo F, et al. Expanding the taxonomy of the diagnostic criteria for temporomandibular disorders. *J Oral Rehabil* 2014;41:2-23.
  11. Nath P, Menon S. Synovial chondromatosis of the temporomandibular joint. *J Maxillofac Oral Surg* 2020;19:230-234.
  12. Zhao W, Ruan Y, Zhang W, Yang F. Synovial chondromatosis of the temporomandibular joint with 400 loose bodies: a case report and literature review. *J Int Med Res* 2021;49:3000605211000526.
  13. Kim TS, Lee YH. Management of disc displacement with retrodiscitis after macrotrauma: a case report. *J Oral Med Pain* 2023;48:25-30.