

# Primary Synovial Osteochondromatosis of the Temporomandibular Joint: A Case Report

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## **Abstract:**

*Synovial chondromatosis (SC) is a rare articular disorder which is characterised by synovial metaplasia with intra-articular proliferation of cartilaginous nodules originating from the synovial membrane. This disorder usually affects large joints and is rarely observed in the temporomandibular joint (TMJ). SC is commonly characterized by the presence of loose bodies in the glenoid fossa, and causing swelling, pain in TMJ region, clicking, crepitation, deviation, limited jaw movement and occlusion disturbances. Radioimaging of the TMJ plays a pivotal role for symptomatic and asymptomatic patients to confirm the diagnosis. We hereby report a case of a patient whose diagnosis of Primary Synovial osteochondromatosis of the temporomandibular joint [TMJ] was primarily done on the basis of Computed Tomography and Magnetic Resonance Imaging findings.*

**Key Words:** Synovial osteochondromatosis, Reichel syndrome, temporo-mandibular joint, computed tomography, magnetic resonance imaging.

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Date of Submission: 06-01-2022

Date of

Acceptance: 18-01-2022

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## **I. Introduction**

Synovial chondromatosis(SC) is a rare benign monoarticular arthropathy characterized by the formation of multiple cartilaginous or osteocartilaginous metaplastic nodules in synovial and subsynovial connective tissue of the joints<sup>[1]</sup>. SC was first described by Ambroise Pare in 1558. It most frequently affects the large articular joints such as knee, hip, elbow, shoulder, and wrist<sup>[2]</sup>. And, the involvement of the temporomandibular joint [TMJ] is rare, though many cases have been published since 1933, and Georg Axhausen reported the first case<sup>[3]</sup>.

Osteocartilaginous loose bodies in TMJ can arise as a direct result of the proliferative disorder of the synovium(primary synovial chondromatosis), or secondary to osteochondral fractures or osteoarthritis<sup>[4,5]</sup>(secondary synovial chondrometaplasia). The primary form seems to be more aggressive and bone erosive and probably originates from mesenchymal remnants that become metaplastic, calcify, and break off into the joint space. The secondary form is associated with degenerative, inflammatory and noninflammatory diseases and is a more passive process<sup>[6,7]</sup>. The most common features are Swelling, unilateral pain, interocclusal changes, clicking, crepitation, deviation, and limited mandibular functions<sup>[4,8]</sup>. Since the synovial chondromatosis of the TMJ is a rare condition, these features may be easily misdiagnosed as other TMJ pathologies or neoplasia<sup>[7,9]</sup>. TMJ Imaging advised for diagnoses

includes conventional x-ray examination, computed tomography [CT], and magnetic resonance imaging [MRI]. Arthroscopy is used as a more conservative means of to obtain definitive diagnosis<sup>[9,10]</sup>. However, pathological analysis is mandatory to confirm the disease. To best of our knowledge, most cases were assessed on the basis of CT or MR images and few studies have reported findings from all imaging modalities, including plain radiography. We report a case of SC in the TMJ, which was diagnosed on the basis of clinicoradiographical analysis, based on the typical imaging findings, including CT, MRI and plain radiography findings.

## **II. Case Report**

A 59-year old female was referred to department of Oral Medicine and Radiology, from ENT department regarding pain in preauricular region of right side, since last 15 days. Pain was dull, continuous in nature, and aggravate while chewing, but relieved on taking nimesulide. Patient also had similar pain 15 yrs back, for which she took nimesulide [NSAID] for last 15 yrs, and also had ultrasonic therapy for 3 months. The patient denied for any history of trauma to the maxillofacial region. Patient was under medication for hypertension and diabetes since last 15 yrs.

On extraoral examination, no evidence of facial asymmetry was noticed. There was no limitation of mandibular movement but mandibular deviation to left during mouth opening was evident. On palpation, ovoid, well defined, tender swelling fixed to underlying tissue was evident in relation to right TMJ. Crepitation was also evident [Figure 1]. Intraorally, there was no significant finding. Based on clinical findings, a provisional diagnosis of benign tumour of Right condyle was made with differential diagnosis as osteoid osteoma & osteochondroma. Patient was advised orthopantomogram (OPG) and non-contrast computed tomography scan (NCCT) of TMJ.

OPG revealed a radiopaque mass into the glenoid fossa of the right temporal bone and around the head of the right condyle, with normal condylar morphology [Figure-2].

NCCT scan axial section [Figure-3a and 3b] revealed the presence of multiple small round-shaped, uniform, well-defined calcified osteochondral bodies noted in medial, anterior and lateral aspects and coronal section [figure-4] revealed calcified bodies in superior aspect of right TMJ, causing expansion of joint cavity. However, right TMJ alignment appears normal. 3-D reconstruction view of right TMJ [Figure-5] study revealed well defined hyperdense lesion obscuring the right condylar process of mandible. These findings were likely to represent primary synovial osteochondromatosis. To evaluate the relationship of loose calcified bodies with joint space, magnetic resonance imaging (MRI) with TMJ coils was advised.

MRI scan sagittal section of right TMJ [Figure-6] study revealed evidence of a large ossified loose body posterior to the right mandibular condyle, with well corticated margins with speckled appearance in the form of multiple T1- and T2- hypointensities within. Multiple other small calcified loose bodies were seen in right TMJ superior and posterior to mandibular condyle and also anteriorly below the articular eminence. These calcified bodies measures between 4-6mm in size. The articular surface of mandibular condyle is flattened and the condyle is displaced anteriorly not articulating with the glenoid fossa but with the articular eminence. The articular disc is slightly deformed in shape with thin anterior band. Suspicious perforation of the articular disc is seen. These findings were suggestive of right TMJ synovial chondromatosis resulting in anterior displacement of mandibular condyle and associated with flattening of the articular surface of condyle and degenerative changes in articular disc.

### **III. Discussion**

This case of Synovial chondromatosis is considered uncommon as large articular joints such as knee, hip, elbow, shoulder, and wrist are most commonly affected regions instead of the TMJ<sup>[9,11,13]</sup>. From the assessed clinicoradiographical features, it was concluded that this is a primary form of synovial osteochondromatosis of TMJ.

Primary synovial osteochondromatosis is represented as a benign cartilaginous metaplasia of mesenchymal tissue with remnants arising in the synovial membrane where fibroblasts beneath its surface become metaplastic and deposit chondromucin, stimulating formation of cartilaginous focus, which further grows by active cellular proliferation<sup>[6,7]</sup>. Once the cartilaginous metaplastic and calcified nodules<sup>[7,12,15]</sup> arise from the synovial membrane, and the fibrocartilaginous disk tissue, it extrudes into the joint space as loose bodies. It is often surrounded by fibrosed connective tissue and synovial fluid,<sup>[14,15,16]</sup> occupying the intraarticular space along with the articular disk. These few characteristics may appear similar as neoplasia, especially chondrosarcoma<sup>[11]</sup> or other pathologies such as degenerative joint disease, rheumatoid arthritis, neurotrophic arthritis, tuberculosis, and osteochondritis ossificans<sup>[7]</sup>. Therefore, imaging examinations such as orthopantomography, CT scanning, and MRI must be carried out for a confirmatory diagnosis and appropriate treatment<sup>[7,9,17]</sup>. Radiographic appearance includes widening of the joint space and expansion of the joint capsule, but evidence of loose bodies is not always present, it is found only in 60% of the cases<sup>[8,13]</sup>, which was evident in our case. CT plays an important role in the diagnosis of the TMJ synovial chondromatosis, as it shows changes of the articular surface of the temporal bone along with swelling of joint capsule and defines size, shape, and locations of the loose calcified bodies<sup>[17]</sup>. And, MRI imaging helps to assess the expansion and thickening of the joint capsule and morphologic changes in the position of the articular disk,<sup>[8]</sup>.

Recently, arthroscopy of the TMJ can be used as a conservative means of obtaining the definitive diagnosis and definitive treatment<sup>[8,9]</sup>. But, the technique is difficult to execute; patients still have to suffer the surgical damage resultant from the insertion of the arthroscope into the joint cavity,<sup>[15]</sup> and some loose bodies are big enough to inhibit this technique. Conservative procedures such as arthrotomy, removal of the loose bodies, partial or total synovectomy, and, particularly, if both joint compartments are affected or if the disk is damaged beyond functional repair, discectomy are the treatment of choice<sup>[8,9,11,14]</sup>.

### **IV. Conclusion**

Radiopacities of the TMJ should be thoroughly investigated in all symptomatic or asymptomatic patients<sup>[10]</sup>. Synovial chondromatosis of the temporomandibular joint should be included in the differential diagnosis of chronic swelling and pain in the preauricular region, and the patient should be sent for appropriate diagnostics and therapy at an early stage.

Through this case report we would like to emphasize on the role of routine dental imaging—orthopantomogram followed by higher imaging such as CT and MRI for diagnosis of such lesions without undergoing any invasive procedure.

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Dr.DivyaSantolia Arya, et. al. "Primary Synovial Osteochondromatosis of the Temporomandibular Joint: A Case Report." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 21(01), 2022, pp. 26-28.