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SYNOVIAL CHONDROMATOSIS OF THE TEMPOROMANDIBULAR JOINT: CONDYLE OSTEOTOMY OF THE MANDIBLE AND PATIENT-SPECIFIC FIXATION IMPLANT

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SYNOVIAL CHONDROMATOSIS OF THE TEMPOROMANDIBULAR JOINT: CONDYLE OSTEOTOMY OF THE MANDIBLE AND PATIENT-SPECIFIC FIXATION IMPLANT

Synovial chondromatosis (SC) of the temporomandibular joint is a rare benign pathologic condition in which cartilaginous nodules form in the synovial lining.² The etiology for the primary SC is unknown, but has been suggested to follow trauma, embryological disturbances, or infection.^{1,3} Symptoms include pain in the TMJ (temporomandibular joint), limited mouth opening, swelling, occlusion changes, and deviation.³ CT (computer tomography) and MRI (magnetic resonance imaging) are leading diagnostic imaging methods.⁴ The final diagnosis is confirmed by pathological examination. The SC treatment is surgery to remove the loose bodies. Arthrotomy with synovectomy is the most common reported treatment.² These are sometimes accompanied by articular disc resection and condylar resection.⁵ The extension and location of the disease affect the choice of the surgical approach. The surgery should aim to eliminate any remaining lesion in the middle cranial fossa and in the infratemporal fossa,² which can lead to extensive surgery. A good alternative may be a condyle osteotomy.⁵ We present a case of synovial chondromatosis successfully treated with joint-conserving surgery with an osteotomy of the condyle and a repositioning of the condyle with a patient-specific implant.

A healthy 49-year-old male presented for evaluation with pain and swelling in the right preauricular region and restricted mouth opening. The patient had a history of blunt condylar trauma 20 years earlier. MRI revealed a pathological expansion of the synovial capsule, erosion of the cranial base and glenoid fossa, and an abundant mass of calcified bodies surrounding the condyle. Access to the lesion was particularly challenging considering that the majority of the nodules were situated on the medial aspect of the condyle. Preoperative planning and surgery were performed at the Department of Oral and Maxillofacial Surgery, Helsinki University Hospital, Finland. A patient-specific titanium implant was designed and engineered with the Planmeca ProModel™ system (Planmeca Ltd), and screw directions were optimized along the thickest bone area of the condyle. The osteotomy line was preplanned virtually. The lesion was exposed via preauricular approach and the condyle osteotomy via retromandibular approach. Screw holes for the patient-specific implant were predrilled, and the implant was temporarily fixed on the planned osteotomy line on the neck of the condyle. A low osteotomy was performed according to the planned line based on the implant position.

The right condyle was turned on the side inferiorly to achieve proper coverage on the surgical field. The lesion was curetted on visual contact. The condyle was repositioned, and the implant was fixed with bicortical screws. Diagnosis of synovial chondromatosis was histopathologically confirmed. The postoperative course was uncomplicated.

The middle cranial fossa has traditionally been accessed via coronal approach, and the zygomatic arch has usually been osteotomized. A low condyle osteotomy is a technique worth consideration in benign conditions to achieve an excellent view of the lesion extending to the fossa, preserving the function of the TMJ and simultaneously generating only moderate morbidity. Using a patient-specific implant in the fixation of the osteotomy line ensures the optimal position of the fixation screws and the precise repositioning of the condyle.

Figure legend to Fig. 1

A 49-year old male had restricted mouth opening, swelling, and pain on the right mandibular condyle. MRI showed pathological expansion of the synovial capsule and glenoid fossa and an abundant mass of calcified bodies surrounding the condyle. Synovial chondromatosis was suspected according to the radiological imaging.

Figure legend to Fig 2.

The osteotomy line was fixed, and the mandibular condyle was repositioned with a patient-specific implant. A postoperative dental panoramatomography image showed the exact position of the right condyle.

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Figure 2

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Author contribution

Manuscript Title SYNOVIAL CHONDROMATOSIS OF THE TEMPOROMANDIBULAR JOINT: CONDYLE OSTEOTOMY OF THE MANDIBLE AND PATIENT-SPECIFIC FIXATION IMPLANT

Please provide details in the table below of each author(s) contribution to the submitted manuscript

AUTHORS	Conception and design of study/review/case series	Acquisition of data: laboratory or clinical/literature search	Analysis and interpretation of data collected	Drafting of article and/or critical revision	Final approval and guarantor of manuscript
Snäll, Johanna	x	x	x	x	x
Haapalainen, Leena	x	x	x	x	x

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24 November 2019

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Dr. Kaveh Shakib

Editor-in-Chief

British Journal of Oral and Maxillofacial Surgery

Dear Dr. Shakib,

Synovial chondromatosis of the temporomandibular joint with extension to the middle cranial fossa is a rare condition. Only limited amount of literature of its treatment is available at the moment. Depending on the localization and extend of the lesion it can be difficult to operate and extensive surgical approaches are used in order to extract all the cartilaginous nodules from the synovial compartments and cranial fossa. This increases the morbidity of the patient.

We present a technique for surgical access to the middle cranial fossa in case of this benign lesion. Performing a low osteotomy of the condyle and turning the condyle laterally and inferiorly on the side while curetting the lesion is an innovative technique worth of consideration in cases of extent synovial chondromatosis surgical treatment. Using preoperatively planned patient specific implant for the fixation of the condyle osteotomy offers even more value on the technique by allowing precise positioning of the condyle.

Attached is our technical note "Synovial chondromatosis of the temporomandibular joint: condyle osteotomy of the mandible and patient-specific fixation implant" for consideration for publication as a technical note. We believe that this note is appropriate for publication by the British Journal of Oral and Maxillofacial Surgery as it offers valuable new information for the oral- and maxillofacial surgery.

We confirm that this original manuscript has not been published elsewhere and is not under consideration by another journal. The authors have no conflicts of interest to disclose. All authors

have approved the manuscript and its submission to the British Journal of Oral and Maxillofacial Surgery.

Sincerely,

Leena Haapalainen

DDS

University of Helsinki

Helsinki University Hospital