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REVIEW ARTICLE

OSTEOCHONDROMA AT THE SITE OF UNTREATED CONDYLAR FRACTURE

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ABSTRACT

Osteochondroma of the mandibular condyle has been found in the oral and maxillofacial region rarely. This paper describes a case of osteochondroma of the mandibular condyle in a 40-year-old man, who was referred to our service with facial asymmetry, prognathic deviation of chin, cross-bite to the contra lateral side, changes in condylar morphology, and malocclusion. Computed tomography (CT) was performed for better evaluation to the pathological conditions on the temporomandibular joint. Based on the clinical examination, patient history, and complementary examinations, the hypothesis of osteochondroma was established. Condylectomy and reconstruction with condylar prosthesis was performed using a preauricular and submandibular approach with total removal of the lesion. Post operatively the patient is symptom-free, and has normal mouth opening with no deviation in the opening pattern.

INTRODUCTION

Osteochondroma (OC) or osteocartilagenous exostosis, a cartilage-capped exophytic lesion that arises from the bone cortex, is one of the most common benign bone tumors. It usually occurs in the axial skeleton, especially long bones, such as the distal metaphisis of the femur or the proximal metaphisis of the tibia (1, 2). The oral and maxillofacial regions are not common sites of OCs, but the embryonic development of the temporomandibular joint (TMJ), by the endochondral ossification, makes this area the most frequent facial site of this type of tumor (2-7). Differently from long bones, craniofacial OCs occur at older ages with a slow growth, even at the end of puberty, most frequently affecting women in their second decade of life (1,8,9). The etiology and pathogenesis of the lesion is not fully understood and neither is its development and neoplastic or reparative nature. The histological appearance reveals an endochondral ossification capped by a proliferative hyaline cartilage. This feature is similar to those seen in epiphysal plates before closure, supporting the theory of pluripotential periosteal cells as precursors of this lesion (1, 2, 7, 10, and 11).

Although condyle OC can present several different clinical characteristics, facial asymmetry, malocclusion, prognathic deviation of chin, cross bite in the contralateral side, and mouth opening disturbance are the most commonly seen manifestations of the disease. These conditions may also be found in unilateral condylar hyperplasia and other differential diagnoses including osteoma, chondroma, giant cell tumor, myxoma, fibro-osteoma, fibrous dysplasia, fibrosarcoma and chondrosarcoma. In spite of the common clinical features, the definitive diagnosis should always be based on clinical, radiological and histological criteria (2,10,11). Complementary examinations such as panoramic radiography and computed tomography (CT) can be useful to visualize the existing relationships among anatomic structures (13). In addition, growing bone surrounded by cartilage is expected to be observed under histological evaluation (2,13). Condylectomy with complete lesion removal is the most common treatment of condylar OC. However, treatment could also be performed without condylectomy (2, 3, 9), and an association with orthodontic treatment should also be considered.

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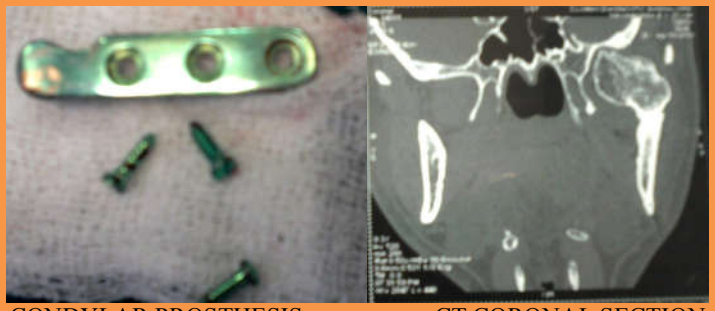
PRE-OP POST –OP 3 WEEKS POST –OP 10 WEEKS

TEMPORAL APPROACH

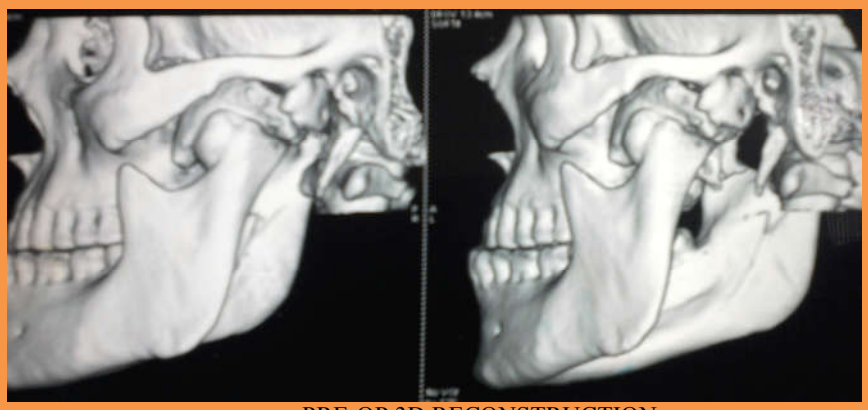
SUBMANDIBULAR APPROACH

TUMOUR SPECIMEN CONYLAR PROSTHESIS FIXATION



CONDYLAR PROSTHESIS CT CORONAL SECTION

PRE –OP 3D RECONSTRUCTION



PRE-OP 3D RECONSTRUCTION

POST –OP OPG 10 WEEKS

fracture resulting from RTA twelve years back, which was treated surgically by condylectomy and reconstructing with condylar prosthesis.

CASE REPORT

A 40-year-old male patient was referred to our hospital complaining of eating difficulty, facial asymmetry, and pain in the left TMJ. Patient gave history of trauma 12 years back and was diagnosed to have left condylar fracture but patient did not seek any kind of treatment for same. He had noted a slowly progressive facial asymmetry for at least 10 years. Clinical examination revealed severe malocclusion, facial asymmetry with approximately 10 mm deviation of the midline to the right side, posterior crossbite, and negative overjet resulting in eating difficulty. The panoramic radiograph showed a well defined radiopacity in the left condyle head, causing deviation of the midline. Coronal and axial CT scans showed a large hyperdense bone growth on the surface of the left condylar head. The lesion extended from the medial surface of the condyle towards the glenoid fossa. Based on clinical examination, patient history, and complementary tests, a diagnosis of OC was hypothesized.

Under general anesthesia, we performed total excision and condylectomy with a modified temporal incision. After skin incision, the underlying subcutaneous tissue, muscle, and fascia were carefully dissected from the condyle. The facial nerve was located at its normal anatomic position and it was carefully moved. After exposing the condyle, the lesion excised and was reconstructed with condylar prosthesis after interposing gleniod fossa with temporalis fascia, finally a drain was placed and all tissues were sutured with 3.0 vicryl and 3.0 mersilk (skin).

The histopathological examination revealed a nodular lesion with cartilaginous cap and immature bone tissue with presence of fiber, neoformed bone and cartilaginous hyaline tissue, confirming the diagnosis of osteochondroma of the condyle. In order to guide the correct position of the mandible, the patient used guiding elastics for 2 weeks. Jaw exercises were undertaken for 3 weeks and repeated 5 times a day after removal of the elastics. Mandibular movements could be easily performed without pain. The patient was satisfied with the postoperative results and remission of pain.

DISCUSSION

OC is not a common disease (13). Its causes are still unclear and symptoms vary depending on the location of the tumor. Trauma and inflammation have been suggested as contributory factors. There have been controversies if such lesions should be considered of developmental, neoplastic or reparative nature (2,11,14). Common clinical manifestations of the OC of the mandibular condyle include facial asymmetry, swelling at the TMJ region, disturbance of mouth opening, and joint pain (7). Our patient had facial asymmetry, pain in the left TMJ and malocclusion. The growth of an OC is usually slow, causing gradual displacement and elongation of the mandible (10). Seki et al. (11) reported a case of condylar OC with complete hearing loss. In the present case, the patient had not experienced ear infection before the onset of symptoms, which included pain in the TMJ region, severe facial asymmetry, midline deviation, but no obstructive hearing sensations. Based on the fact that the tumor arose from the posteromedial surface of the condyle and little limitation of mouth opening was observed, we believed that the patient had suffered a minor trauma to the condyle. A careful assessment of the patient's history might provide valuable information for the diagnosis and treatment of facial asymmetry (16). The diagnosis of OC was proposed based on clinical and radiographic findings. Imaging techniques can be valuable tools for accurately diagnosing and determining treatment for a variety of diseases and are supportive to clinical examination (10, 13). CT scans can easily demonstrate the continuity of cortex and medulla of the parent bone tumor. In the present case, they were useful to determine the margins of the OC causing facial asymmetry. Sales et al. (17) reported that CT imaging brings to radiologists and clinicians the possibility of evaluating complex cases in the maxillofacial field and giving information that leads to more accurate and specific diagnosis of some TMJ pathological conditions. Preoperative CT assessment can be of great important role in the treatment planning of these tumors (1, 18, and 19). Although CT scans have not been considered the best tool to evaluate non-calcified cartilage caps, they have a recognizably high accuracy to demonstrate calcified cartilage, and to delineate soft-tissue alterations secondary to tumor growth and atrophy of the masticatory muscles for complementary surgical indications. CT images are also of great value for differential diagnoses, especially in differentiating condylar OC from unilateral condylar hyperplasia. OC is usually seen as a growth of the morphologically normal condyle, while condylar hyperplasia is seen as an enlargement of the condylar process (1). According to Villanueva et al. (13), the main goal of OC treatment, regardless of the lesion etiology, should be the achievement of acceptable mouth opening ranges. Our main objective in treating our patient was to recover his facial

symmetry and reestablish facial harmony and occlusion after surgery associated with orthodontic treatment. Haag et al. (16) emphasized that treatment goals should be specified according to the diagnosis of facial asymmetry. In cases of acceptable facial esthetics, orthodontic camouflage treatment could be done to correct dental asymmetries. It has been recommended that correction of asymmetric occlusion should be done at the early stages (16). Several surgical approaches have been suggested for the treatment of condylar OCs, including complete resection of the tumor using condylectomy, condylectomy with reconstruction, or selected tumor removal without condylectomy (5, 17). The treatment of choice in this case was condylectomy with reconstruction. Condylectomy cannot be recommended as a routine procedure for all cases. If the tumor involves only a limited area of the condylar surface, preservation of the remaining part of the condyle, and reshaping should be done. A conservative condylectomy with articular disc repositioning combined with orthognathic surgery is an acceptable option for treatment of condylar OC (2, 20). The patient was satisfied with the postoperative results. Some authors have proposed reconstruction using vertical sliding osteotomy of the mandibular ramus and two miniplates for osteosynthesis (21). This technique can be an alternative for the reconstruction of small and medium defects resulting from condylectomy, as well as small vertical dimension losses derived from posttraumatic avascular necrosis of the condyle and idiopathic condylar resorption. Histologically, the diagnosis of an OC includes chondrocytes of the cartilaginous cap arranged in clusters parallel to lacunar spaces. Differential diagnoses of OC include osteoma, benign osteoblastoma, chondroma, and chodroblastoma (2). It is very important to differentiate OC from these previous lesions. Condylar OC should be considered in the differential diagnoses of tumors of the TMJ region. Orthopantomograph at best can be considered as a screening tool in the detection of these lesions. CT scans should be performed in all cases of suspected condyle OC (1).

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