I J Pre Clin Dent Res 2015;2(4):84-88
Oct-Dec

International Journal of Preventive & Clinical Dental Research

Osteocartilagenous Exostosis of Mandibular Condyle: A Rarity that is Explored!!: Case Report

Abstract

Objective & Aim: Osteochondroma/osteocartilagenous exostosis is a cartilage capped bony neoplasm arising on external surface of bone containing marrow cavity that is continuous with that of underlying bone. It arises in bone preformed by endochondral ossification. This type of lesion can occur as solitary lesion or within content of multiple osteochondroma. Osteochondroma rarely affects the craniofacial bones. This is a case report of 42 year old male patient with osteochondroma of left condyle. Who presented with swelling of left preauricular region.

Key Words

Osteochondroma; benign tumor; endochondral ossification; metaplasia

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INTRODUCTION

The word osteochondroma is made up of the prefix "osteo" that means bone, "chondroma" means cartilage and suffix "oma" that refers to benign tumor. Thus osteochondroma is a benign tumor which is made up of a mix between cartilage and bone. A tumor is an abnormal growth but "benign" means that it does not travel to other places in the body and is not life threatening.[1] This type of benign tumor characterized by cartilage capped bony growths that project from the surface of affected bone. The structure of tumor composed of the central made up of bone marrow which is identical to and continuous with the marrow of underlying bone. This is enveloped by cortex and periosteal covering. Which are continuous with that of affected bone. Tumor is capped by layer of hyaline cartilage, which frequently extends well over the pedicle and sometimes approaches the normal cortex. The exostosis is produced by progressive endochondral ossification of this growing cartilaginous cap. The cartilaginous portion of the osteochondroma acts as an endochondral plate for this abnormal growth and persists as long as there is growth activity,[2] several authors considered the skeletal osteochondromas as a true tumor while some author consider it as growth disturbances or developmental lesions that results from separation of a fragment of epiphyseal growth plate, which subsequently herniated through the periosteal bone cuff that normally surrounds the growth plate (encoche of Ranvier)[3] so an osteochondroma can arise in any bone that develops from endochondral ossification. Osteochondroma is frequently seen in the axial skeleton. The most common locations of the tumor are the distal metaphysis of the femur and the proximal metaphysic of the tibia.[4] Osteochondromas are one of the most common benign tumours of bone, representing approximately 35% to 50% of all benign tumours and 8% to 15% of all primary bone tumours. These tumours are rare in the craniofacial region (0.6%). Osteochondroma of the condyle is a rare entity and accounts for 1-2% of benign tumors of the jaw. The mean patient age is 39.7 years, with a peak in the fourth decade[5]. The male to female ratio is 1:1.28. Roy choudhury *et al.*,[6] made it more accurate to say that by 2011 at least 108 cases had been reported in the English-language literature. The number of single case reports is 48; the largest case series is 17.

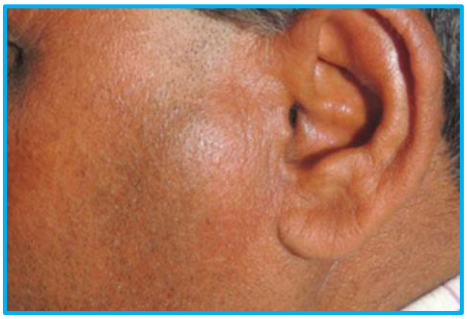

Fig. 1: Diffused swelling present on left preauricular region

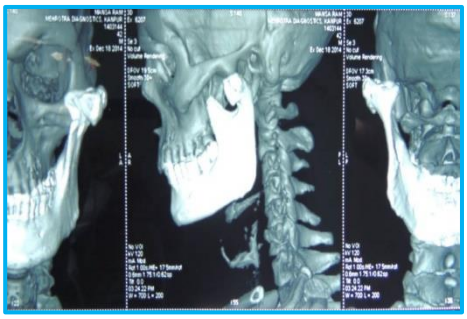

Fig. 3: 3-D CT showing extension of tumore on lateral and superior

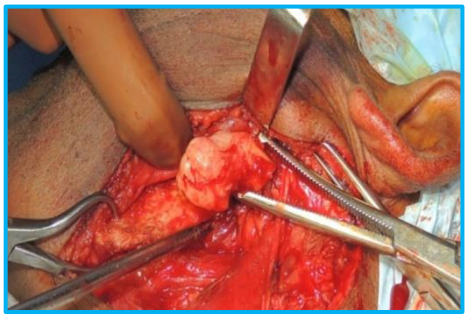

Fig. 5: Intra operative photograph showing resection of condyle along with tumor

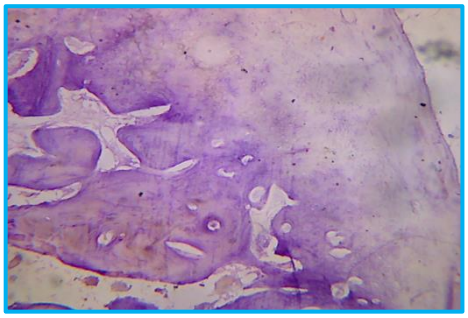

Fig. 3: Microscopioc picture showing thin hyperplastic chondroid tissue capped over mature bony trabeculae

CASE REPORT

A 42 year old man reported to our Department of Oral and maxillofacial surgery with chief complaint of swelling on left preauricular region since 4 years which gradually increases in size. There was no significant family history; no one in his family had the same problem earlier. No history of trauma was

Fig. 1: Slightly deviation of mandible towards right side with ipsilateral open bite

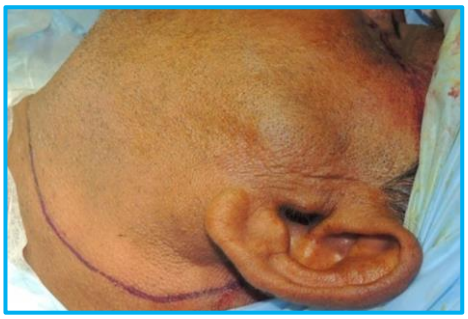

Fig. 4: Submandibular incision with posterior extension

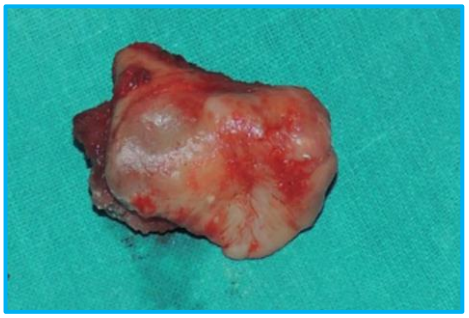

Fig. 6: Specimen size 3x2 cm

reported. On examination swelling was bony hard and no tender on palpation with normal overlying skin, no sign of ear infection or any TMJ disorder present. Intra oral Examination of the patient revealed slightly deviation of the chin to the right side. There was a left posterior openbite. The CT scans of the maxillofacial area showed a large bonelike mass at the lateral pole of the left condyle extending superiorly, Based on clinical and radiographic examination, the lesion of the left mandibular condyle was considered as osteochondroma with differential diagnosis of osteoma, benign osteoblastoma, chondroma, chondroblastoma. The patient was admitted to Rama dental college and hospital Kanpur for surgical removal of the tumor. The eletrocardiogram, chest radiography, and routine urine and blood values were within normal limits. After uneventful nasotracheal intubation and establishment of general anaesthesia, the patient

was draped in a sterile fashion for surgery. A Risdon approach with post ramal extension was created below the left mandibular angle to access the condylar neck. The pterygomasseteric sling was cut and detached, and the masseter muscle was vertically split to facilitate access to the angle, ramus, and neck of condyle. The growth was identified intra-operatively and the mass was excised at the condylar neck with stripping of its muscular attachments. Hemostasis was obtained and closure was done in layers. Maxillomandibular fixation was done to retain the occlusion for 2 weeks follwed by functional physiotherapy for 3 weeks. Active range of jaw motion exercises including jaw opening including lateral excursion and protrusion was performed 4-6 times per day. Histopathological examination of the excised mass showed dense spicules of lamellar bone interspersed with fibrous fatty marrow and capped by cartilage of varying thickness. Focal areas of active chondrocytes with endochondral ossification at the osteocartilaginous junction were noted. Based on the history, clinical, radiographic and histopathological correlation a final diagnosis of osteochondroma of the left condyle was rendered.

DISCUSSION

WHO in 2002 defined OC (also known as osteocartilagenous exostosis) as a cartilage capped bony projection arising from the external surface of bone containing a marrow cavity that is continuous with that of the underlying bone.[7] Osteochondroma is frequently seen in the axial skeleton. The most common locations of the tumor are the distal metaphysis of the femur and the proximal metaphysic of the tibia. Osteochondromas are rare in the maxillofacial region, because these bones develop by intramembranous ossification. When present the tumor is most commonly associated with the coronoid process. Enlargement of the coronoid process of the mandible was first described by Langenbeck in 1853, and joint formation between the coronoid process and the zygoma was first described by Jacob in 1899. Other sites such as posterior maxilla, symphysis, gonion, zygomatic arch, ramus and maxillary sinus have also been reported.[8] Osteochondroma of the mandibular condyle as seen in our case is an extremely rare entity. The osteochondroma of the condyle appears as a cartilage-capped exostosis arising from the condyle. Grossly, the lesion is usually lobulated or irregular in contour and causes deformation of the normal condylar morphology. The cause of the lesion is not clear. Trauma and inflammation may play a role in some instances as either an initiating factor or a predisposing factor. Cases of birth trauma from forceps delivery or disturbances due to infection of the joint are not uncommon. Three etiological theories have been presented in the literature. Langenskiold theorized that the lesions result from a proliferation of the cells of the undifferentiated cell layer of the epiphysis and subsequent displacement of the cells to the metaphysis. This theory does not seem to explain the tumor's presence in the condyle. Geshickter and Copeland theorized that normal focal accumulations of cells with cartilaginous potential exist at all points of tendonous insertion. Continued stress and strains at these points might cause hyperplastic changes in these collections which could result in osteochondroma. The most appealing theory for lesions in extracondylar locations, in which tendon insertions are not present, was proposed by Lichenstein. He suggested that as the periosteum has the potential to develop osteoblasts as well as chondroblasts, the lesion could result from a spontaneous or induced metaplasia of the periosteum, which might form cartilage that subsequently undergoes endochondral ossification.[9] Clinical manifestations of osteochondroma of the mandibular condyle are facial asymmetry, malocclusion, and joint pain. Initially osteochondroma usually presents no symptoms, but symptoms may develop as the tumor size increases. Radiographically the tumors appear as an irregular shaped enlargement of the condyle exhibiting varying densities. Grossly, they are lobulated resulting in deformations of the normal condylar morphology. Advance imaging modalities are helpful in determining the extent of the lesion. More recently, bone scan using technetium 99 methyl diphosphonate performed with single photon emission tomography (SPECT) has been used, which enables more accurate determination of the extent of the tumor. The radiographic differential diagnosis of solid lesions of the condyle includes condylar hyperplasia, Condylar hypertrophy, osteoma, chondroma, giant cell tumor, myxoma, ameloblastoma, fibro-osteoma, fibrous dysplasia, fibrosarcoma and metastatic disease. Osteochondroma of the mandibular condyle must be distinguished from unilateral condylar hyperplasia. The latter is manifested clinically and radiographically as an enlarged condylar process, whereas the osteochondroma usually shows a

globular projection extending from the margins of the condylar head with the normal outline of the condylar head being maintained. CT plays a decisive role in differentiating the two entities in that the osteochondroma is seen as a growth arising from the morphologically normal condyle, while condylar hyperplasia is seen as enlargement of the condylar process. Histologically, these lesions are composed of well-circumscribed bone and cartilaginous cap. Underlying the cartilaginous cap is the bony component, which may also have proliferating chondrocytes overlying bone that resembles the condyle as it undergoes endrochondral ossification. The treatment protocol for these condylar tumours is controversial. Local resection or conservative condylectomy with recontouring of the residual condylar neck and repositioning of the articular disc is a viable option for treatment of osteochondromas that involve the head of the condyle, without the extension of tumour into the neck. In 2002, Wolford *et al*.,[10] proposed removal of the Condylar osteochondroma with preservation of the remaining bone since it is an exophytic growth and not an invasive lesion. Conservative surgical approach, however, seems to be limited by technical difficulties to achieve an adequate exposure to enable a selective yet radical tumor resection. The argument against a conservative approach is the possibility of inadequate removal that may result in a recurrence of the lesion. Some authors propose conservative resection with preservation of most of the condyle by tumorectomy in multiple fragments, and minimal condyle reshaping through burring This approach is difficult in most cases because of the typical location of the tumour (medial part of the condyle) and adjacent structures. Although Aydin *et al*., advised to make condylectomy to provide extra space and better exposure of the tumour of the mandibular condyle. A problem after such condylectomy may be a lateral open bite on contalateral side unless some kind of reconstruction is performed. Depending on the resulting defect after condylectomy several reconstructive options are available namely free costochondral grafting, free flaps orthognathic surgery, prosthesis and sliding osteotomy. It was not performed in our case because after the tumour resection a perfect occlusion was established with reasonable face symmetry.

CONCLUSION

Mandibular osteochondroma, though a rare entity, should be considered in the differential diagnosis of masses in the region of the temporomandibular joint. Panoramic radiographs at best can be considered as a screening modality in the detection of these lesions. A CT examination should be performed in all cases of suspected osteochondroma of the mandibular condyle. In our case, we employed sub sigmoid condylectomy. Finally after surgical protocol patient should be subjected to IMF for two to three weeks and long period of physiotherapy.

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