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Osteochondroma Arising from Zygomatic Arch - A Case Report

Dr. V. Srinivasulu Reddy MDS [1], Dr. M. Suresh Kumar, MDS [2], Dr. K. Amarnath MDS[3], Dr. A. Sreevaishnavi MDS [4]

[1]Professor, Department of Oral and Maxillofacial Surgery, Meghna Institute of Dental Sciences, Nizamabad

[2]Professor and HOD, , Department of Oral and Maxillofacial Surgery, Meghna Institute of Dental Sciences, Nizamabad

[3]Professor, Department of Oral and Maxillofacial Surgery, Meghna Institute of Dental Sciences, Nizamabad

[4]Post Graduate Trainee, Department of Oral and Maxillofacial Surgery, Meghna Institute of Dental Sciences, Nizamabad

Abstract: ***WHO defines osteochondroma (also known as osteocartilagenous exostosis) as a cartilage capped bony protrusion on the external surface of bone. It is one of the most common benign bone tumor and occurs in any facial bone that develops by endochondral ossification. The craniofacial regions are not common sites of osteochondromas. Reported regions of occurrence in craniofacial skeleton include skull base, maxillary sinus, zygomatic arch and mandible. The mean age of occurrence is the fourth decade of life with more prediction towards females. Malignant transformation of osteochondroma is very rare with <1% in oral and maxillofacial region. Recurrance rate of osteochondroma in oral and maxillofacial region is <2% with uncertain etiology and controversial pathogenesis. The following is a case report of osteochondroma arising from the zygomatic arch in a 32 year old male patient with the chief complaint of decreased mouth opening since four months. In oral and maxillofacial region osteochondromas are more common in mandible than in maxilla and in mandible coronoid and condyle are most commonly reported areas which are affected. The patient was advised for excision of the lesion after thorough clinical and radiographic examination. The lesion was excised under general anaesthesia with no intra and post operative complications. There was a good improvement in the mouth opening post operatively. There was no evidence of recurrence till date. Diagnosis was confirmed by histopathology.***

Keywords: Osteochondroma, craniofacial skeleton, pathogenesis, occurrence, recurrence rate

1. Introduction

WHO defines osteochondroma (also known as osteocartilagenous exostosis) as a cartilage capped bony protrusion on external surface of bone. It is one of the most common benign bone tumor and occurs in any facial bone that develops by endochondral ossification. They are not true tumor but is regarded as a disorder of growth and development.Osteochondromas may occur as solitary sporadic exostosis or there may be multiple hereditary exostosis

Etiology is uncertain with etiological factors being traumatic, inflammatory, developmental, reparative and genetic mutations. Hereditary forms are due to germline mutation in EXT_1 and EXT_2 gene while sporadic type is due to mutated EXT_1 only.

Osteochondromas are seen to occur in fourth decade of life with mean age of 39.7 years and has a slight prediliction towards female gender. Malignant transformation is very rare with < 1%.[4] Risk of malignant transformation of multiple hereditary exostoses is much greater. The choice of treatment is always almost surgical with recurrence rate of 2%.

2. Case Report

A 32 year old male patient presented with a chief complaint of restricted mouth opening and difficulty in cleaning his left ear since four months. Patient did not report any pain or changes in occlusion nor did he give any history of trauma. Clinical examination revealed a mouth opening of 15mm interincislly.

A CT scan revealed a bony lesion arising from the inferior border of posterior one third of zygomatic arch, extending inferiorly, medially & posteriorly. The lesion measured approximately about 3.5 X 1.6 X 2.7 cm (AP X CC X TR) on radiographic examination. The deep surface of the lesion had a lucent irregular margin with an intervening soft tissue density between the lesion and infratemporal space. Provisionally the lesion was diagnosis as fibroosseous lesion.

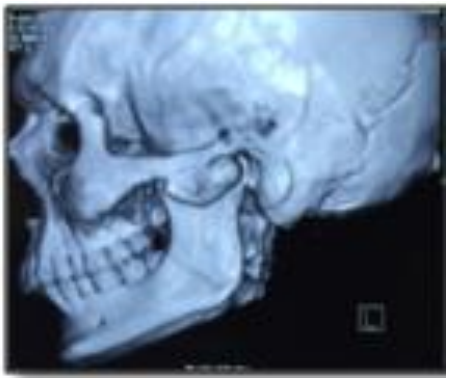

Figure 1: 3D CT revealing the bony overgrowth arising from zygomatic arch

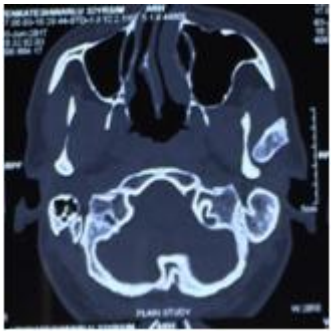

Figure 2: CBCT revealing the bony overgrowth arising from zygomatic arch

The lesion was accessed by a preauricular incision with temporal incision (Al Kayat Bramley incision). Osteotomy was made at the inferior border of the zygomatic arch and the lesion was excised intoto. The excised lesion was sent for histopathological examination.

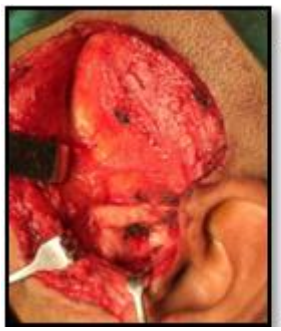

Figure 3: Alkayat Bramely

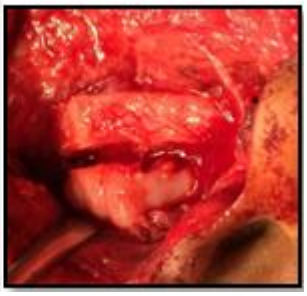

Figure 4: Osteotomy incision

Figure 5: Surgical site

Figure 6: Excised Mass

Histopathology

On examination of decalcified sections multiple lamellar bony trabeculae of varying thickness and intervening fibroadipose tissues, normal lamellar pattern with few trabeculae and increased vascularity and osteoblastic lining were noted. There is a cartilaginous cap with pale bluish matrix and chondrocytes scattered singly. All the above features suggests a histopathological diagnosis of Osteochondroma.

3. Result

The procedure was uneventful with no significant complications. The facial nerve function was intact and there was no change in his occlusion. The patient also reported that his ear canal was patent and was able to clean it. There was also noticeable improvement in mouth opening upto 35mm in the immediate post operative period. The patient experienced no complication posts operatively (Facial nerve dysfunction or occlusal changes).

4. Discussion

Long bones such as distal femur and proximal humerus undergo endochondral ossification and are most common sites of osteochondromas. Osteochondromas of oral and maxillofacial region is of rare occurrence. It is usually a mushroom shaped convex lesion.[1] Jacob's disease, a rare variant of osteochondroma of coronoid process which interfers with zygomatic arch forming a pseudo joint.[5]

The exact pathogenesis of osteochondroma is controversial. Several theories regarding its craniofacial origin exist which are as follows:

1) Herniation of epiphyseal plate through a periosteal defect.
2) Relocation of epiphyseal chondrocytes from a peripheral area of growth plate when epiphyseal cartilage abnormally separates from a satellite focus of ossification.
3) Periosteal stress in area of tendon insertion where areas of chondrocytic potential exist.
4) Metaplasia of pluripotent periosteal cells, which may undergo endochondral ossification.
5) Retained cartilaginous rests along synchondroses of craniofacial bones.

Whether the osteochondroma is a true neoplasm or a reactive phenomenon remains an unsettled issue although the former is most widely accepted.[1]

Malignant transformation has been reported to occur with a frequency of < 1% in cases of solitary lesions. There is a higher a higher incidence of malignant transformation (5% - 25%) in hereditary, autosomal dominant disorder of multiple osteochondromata or osteochondromatosis.

Histopathological findings of osteochondroma include continuity of cortical bone, lamellar bony trabeculae, osteoblastic lining and chondrocytes which are all observed in our case.[6]

Differential diagnosis include osteoma, fibrous dysplasia, chondroma and ossifying fibroma.[1] The presence of continuity of cortical bone and sparse trabecular bone suggest a diagnosis of osteochondromas.

The only definitive treatment of osteochondroma is surgery, although a recurrence rate upto 2% has been reported elsewhere in the body. No case report has a lesion of the zygomatic arch recurred.[1]

5. Summary

Whether the osteochondroma is a true neoplasm or a reactive phenomenon remains unsettled. Although osteochondromas are the most common tumors of bone, they are rarely occur in facial region. Malignant transformation is very rare with a chance of <1% in other regions of the body. In current literature, there is no evidence of recurrence of the lesion in the orofacial region following excision.

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