

CASE REPORT

Osteochondroma of Mandibular Condyle

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ABSTRACT

Osteochondroma is one of the most common benign bone tumor of axial skeleton. In oral and maxillofacial region, osteochondroma is rare. This tumor most often involves mandibular coronoid process however the osteochondroma of mandibular condyle is extremely rare. The anterior and medial half of mandibular condyle is involved more than lateral and superior half. We report a case of osteochondroma of mandibular condyle in 27-year-old female with clinic-radiologic correlation.

Keywords: Osteochondroma, Mandibular condyle, Temporomandibular joint, Condylectomy.

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INTRODUCTION

Osteochondroma or osteocartilagenous exostosis of temporomandibular joint is a rare, slow growing benign tumor which originates from cortex of bone. Osteochondroma can be redefined as cartilage capped exophytic lesion that arises from cortex of bone.¹

Osteochondroma is one of most common benign tumor of bone. The incidence of osteochondroma varies. According to Murphey et al¹ osteochondroma constitutes 20 to 50% of all benign tumors and 10 to 15% of all bone tumors. While Karras et al² and Wolford et al³ stated that 35 to 50% of all benign tumors and 8 to 15% of all primary bone tumors are osteochondromas. It usually develops in axial skeleton or long bones. The most common site of occurrence is either distal metaphysis of femur and proximal metaphysis of tibia.^{4,5} The oral and maxillofacial regions are not common site for development of osteochondromas because only temporomandibular joint is formed by endochondral ossification. Due to embryonic development of temporomandibular joint by endochondral ossification, temporomandibular joint is

most predilected for development of osteochondromas.⁶ The osteochondroma is a developmental lesion rather than a true neoplasm.¹ In oral and maxillofacial region, it is most commonly associated with coronoid process of mandible.⁷ Osteochondroma of mandibular condyle is rare and till date only 65 well documented cases have been reported in English literature.⁸ Osteochondromas are also reported in cranial base, posterior maxilla, maxillary sinus, ramus, body and symphyseal region of mandible.⁹ The etiopathogenesis of osteochondromas is not fully understood. On the basis of similarities in histological characteristics of osteochondromas and epiphyseal plates before closure Holmlund et al¹⁰ and Seki et al¹¹ supported the theory of pluripotential periosteal cells as precursors of osteochondromas. Porter and Simpson¹² hypothesized somatic mutations in chromosome 8 and 11 is responsible for neoplastic pathogenesis of osteochondroma. The clinical symptoms associated with osteochondroma may develop over a considerable period of time due to slow growth rate of tumor in mandibular condyle. Clinically, osteochondromas of mandibular condyle is characterized by occlusal disturbances, facial asymmetry, restricted mandibular movements, pain with varying intensity, clicking, popping and crepitation of affected temporomandibular joint¹³ and altered condylar morphology.¹⁴ The differential diagnosis of osteochondroma includes osteoma, chondroma, fibrous dysplasia, unilateral condylar hyperplasia, myxoma, fibro-osteoma, fibrosarcoma, etc. However, the treatment of condylar osteochondroma is primarily resections of condyle.¹³

CASE REPORT

A 27-year-old female patient (Fig. 1) reported to outpatient section of Department of Oral Medicine and Radiology, Faculty of Dental Sciences, King George's Medical University, presenting with complaint of a swelling in left parotid region for 2 years (Fig. 2). The patient was conscious of swelling due to its slow increase in size and pain as well difficulty in chewing food. There was clicking sound and pain in left temporomandibular joint region for 4 months. The patient was well nourished and well oriented. She had no significant dental history. Extraoral examination showed a swelling of 1 × 1.5 cm was observed in left parotid region of face (Fig. 3). On palpation, swelling was found to be bony hard in consistency. It was immobile and attached to under-

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Fig. 1: Patient photograph



Fig. 2: Swelling in left tragus region for 2 years



Fig. 3: Extraoral examination showing a swelling of 1 × 1.5 cm was observed in left parotid region of face



Fig. 4: No abnormality found in intraoral examination

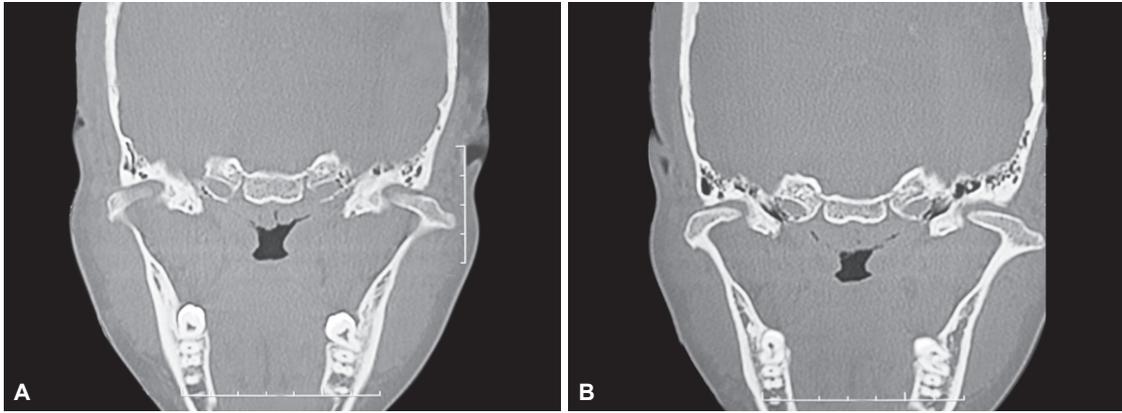


Fig. 5: Panoramic radiograph showing an irregular radiolucent mass of 1.5 × 1.5 cm surrounded by well defined radiopaque margin was present superimposing on anterior end of neck of left condyle

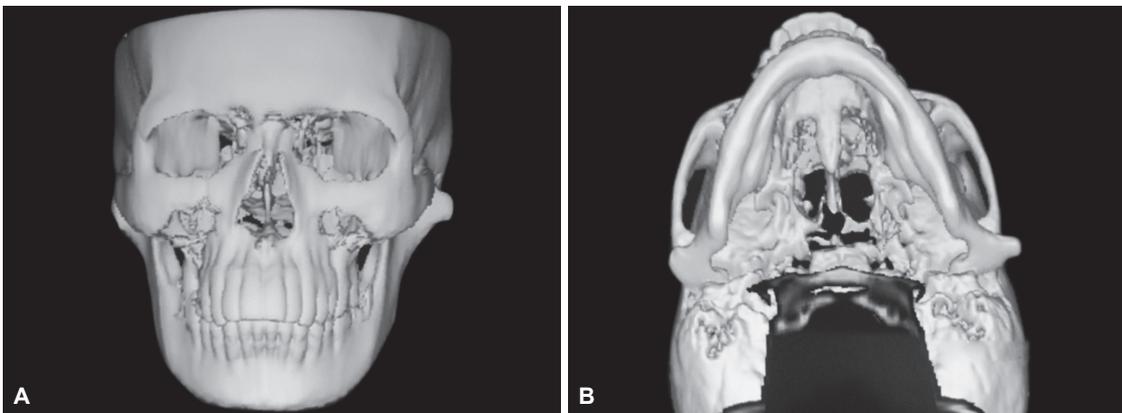
lying tissue but with opening and closing of mouth swelling was moving with jaw movements. On jaw movements, mandible was deviated toward right side. There was mild facial asymmetry (Fig. 1). The skin over the swelling was freely mobile. It was not causing any color or temperature change on skin overlying left parotid region. There was no lifting of left ear lobe. No abnormality had been detected on intra-oral examination (Fig. 4). On the basis of clinical finding, a provisional diagnosis of idiopathic osteosclerosis has made. Osteochondroma, osteoma, osteoid osteoma, monostotic fibrous dysplasia, osteosarcoma, osteoblastic metastasis, paget's disease are included in differential diagnosis. The patient is advised for radiographic investigations.

In panoramic view (Fig. 5) on left side, an irregular radiolucent mass of 1.5 × 1.5 cm surrounded by well defined radiopaque margin was present superimposing on anterior end of neck of condyle. The computed tomography (CT) (coronal sections) showed an abnormal, well defined pedunculated rounded bony outgrowth arising from the neck of left mandibular condyle extending anteriorly, laterally and medially into infratemporal fossa having dimension of 1.5 × 1 × 1 cm. The cortex and medulla of the lesion were continuous with same structures of the mandibular condyle, a feature that is considered diagnostic of osteochondromas (Figs 6A and B).

Computed tomography with three-dimensional (3D) reconstruction showed rounded bony mass projects out from the lateral cortex of upper end of the neck of left mandibular condyle (Figs 7A and B). The clinical and imaging findings were highly suggestive of osteochondroma of left condylar neck. The patient was referred to department of oral and maxillofacial surgery for biopsy. The patient is advised for access osteotomy and excision of lesion. All routine investigation has been done and patient is operated under GA. The histopathological examination showed a nodular lesion with cartilagenous cap and immature and newly formed bone and cartilagenous hyaline tissue confirming the diagnosis of osteochondroma (Fig. 8).



Figs 6A and B: (A) Coronal CT showing well-defined pedunculated rounded bony outgrowth arising from the neck of left mandibular condyle, (B) coronal CT showing the cortex and medulla of the lesion were continuous with same structures of the mandibular condyle, a feature that is considered diagnostic of osteochondromas



Figs 7A and B: (A) Computed tomography with 3D reconstruction showing rounded bony mass projects out from the lateral cortex of upper end of the neck of left mandibular condyle, (B) CT with 3D reconstruction showing rounded bony mass projects out from the lateral cortex of mandibular left condyle

DISCUSSION

Osteochondroma is a slow growing benign tumor of the appendicular skeleton mostly arises from metaphyseal regions of long bones. Most commonly seen in 2nd and 3rd decade of life. Osteochondromas are not common in orofacial region. Literature review suggests that most of osteochondroma present mainly in 4th decade of life with mean age of 39.7 years and male to female ratio 1:1.5^{8,14} Temporomandibular joint is most predilected site for development of osteochondromas.⁶ The osteochondroma is a developmental lesion rather than a true neoplasm.¹ In oral and maxillofacial region, it is most commonly associated with coronoid process of mandible.⁷ Osteochondroma of mandibular condyle is rare and till date only 65 well-documented cases have been reported in English literature.⁸ Malignant transformation in solitary type osteochondroma is rare. However, approximately in 5% cases of multiple hereditary chondromatosis malignant transformation has been reported.¹⁵

Regarding pathogenesis of osteochondromas several theories have been proposed from time to time. In 1891, Virchow¹⁶ proposed the physal theory. According to this

theory, a portion of the physal cartilage becomes separated from parent tissue then rotates 90° and grows in a direction transverse to the long axis of bone. According to Keith,¹⁷ a defect in the perichondral ring surrounding the physis is the cause of osteochondroma. Muller's¹⁸ periosteal theory states that exostoses are produced by small nests of cartilage derived from cambium layer of periosteum. However, Lichtenstein¹⁹ proposed that the periosteum has the potential to develop osteoblasts and chondroblasts. The osteochondroma could develop by spontaneous or induced metaplasia of periosteum to form cartilage that subsequently undergoes endochondral ossification.

Clinically, osteochondroma is characterized by facial asymmetry, disturbed occlusion, hypomobility, pain and clicking, posterior apertognathia on affected side, crossbite on unaffected side, palpable, painless temporomandibular area mass with limitation in mouth opening and mandibular movements.^{20,21} The vertical height of condylar neck and ramus on affected side may increase.²¹

Radiographically, most reports described osteochondromas as a nodular or mushroom shaped bony enlargement capped with cartilage on condylar surface. On panoramic

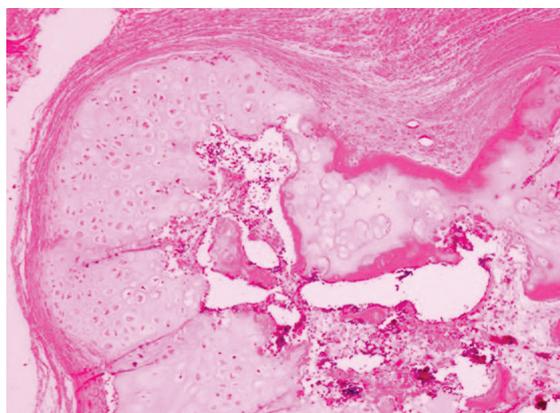


Fig. 8: Histopathological photomicrograph showing a nodular lesion with cartilaginous cap and immature and newly formed bone and cartilaginous hyaline tissue (100x)

radiograph, osteochondromas can arise on different areas around the mandibular condyle and present diverse appearances.²² These lesions are either radiopaque with well-defined borders or mixed density exophytic mass found on anterior-medial surface or superior surface of mandibular condyle.²² The radiographic presentations of osteochondromas of mandibular condyle is most commonly found on medial aspect of mandibular condyle (52%) followed by anterior location (20%) and rarely in the lateral or superior positions (1%).²³

However, preoperative CT may help to delineate the anatomy of lesion, it also provides excellent bony details and demonstrates calcification in cartilaginous cap optimally.²² Computed tomography scan of osteochondromas clearly delineate the continuation of the cortex and medulla of the parent bone with bone of tumor, a pathognomonic and diagnostic feature of osteochondromas.¹ Computed tomography is not best imaging modality for evaluation of uncalcified cartilage cap, however calcified cartilage can be well evaluated on CT. Magnetic resonance imaging (MRI) helps to evaluate uncalcified cartilage.²² Histologically, the osteochondromas are characterized by layer of thickened cellular periosteum underlying a sheet of proliferating chondrocytes (cartilaginous cap) below this cartilaginous cap lies zone of ossification responsible for formation of cancellous bone.

The differential diagnosis of osteochondroma includes unilateral condylar hyperplasia, osteoma, chondroma, myxoma, fibro-osteoma, fibrous dysplasia, fibrosarcoma, etc.¹³

The treatment of choice for osteochondroma is surgical resection. Several surgical methodology has been suggested including condylectomy, condylectomy with reconstruction or selected tumor removal without condylectomy.^{2,24} A conservative condylectomy with articular disc repositioning combined with orthognathic surgery is an acceptable option for treatment of condylar osteochondromas.²⁵

CONCLUSION

As osteochondromas are mostly incidental findings on routine radiographs. It should always be considered in differential diagnosis of masses in temporomandibular regions.

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