Two-Year Radiographic Evolution of an Archetypal Variant of Peripheral Osteoma on the Mandibular Angle

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ABSTRACT

Osteomas are benign bone tumours characterised by the abnormal proliferation of compact or cancellous bone at the endosteum or periosteum and rarely in extraskeletal soft tissues. They are infrequently found in the jaw bones. The most prevalent variant in jaw bones is peripheral osteoma, which frequently exhibits mandibular predilection. Although the precise cause of this is still unclear, some pathologists hypothesise that the osteoma is not a true neoplasm and represents an osseous hamartoma. It is believed that muscle activity, trauma, endocrine influences, and infections all have a role in its development. Osteomas can affect any age group, with a predilection for young adults, regardless of gender. In this report, we describe an uncommon instance of a peripheral osteoma located at the mandibular angle in a 12-year girl, along with a concise literature review.

Key Words: *Osteoma, Peripheral, Angle of mandible.*

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INTRODUCTION

Osteomas, benign bone tumours of dense or spongy bone mass, occur centrally, peripherally, or rarely extra-skeletally, arising from the endosteum, periosteum, and soft tissues, respectively.[1,2] Commonly seen in the craniofacial bones, these are rarely seen in jaw bones. The predominant jaw variant is peripheral osteoma (PO). It exhibits mandibular predilection on the posterior body, condyle, and angle, and rarely on the ascending ramus, coronoid process, and sigmoid notch.[3] The precise cause of osteomas is uncertain. Potential risk factors include congenital defects, inflammation, abnormal muscle activity, trauma, viral infections, and embryogenic and endocrine influences.[4]

Multiple osteomas, signalling Gardner's syndrome, demand a thorough investigation, involving dentists for an early-stage diagnosis.[1]

In this report, we describe an uncommon case of a PO located at the mandibular angle in a 12-year girl in the light of existing literature.

CASE REPORT

A 12-year girl presented at the Department of Oral Medicine and Radiology with a painless hard swelling on the right mandibular angle.

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The patient recalled noticing it for the first time 2 years ago as a small swelling for which she consulted a general dentist (Figure 1). There, a lateral cephalogram radiograph was performed, which showed an oval radiopaque mass of approximate size 3 × 4 mm in the right angle of mandible (Figure 2). On follow-up visits, the swelling showed progressive enlargement, as confirmed by comparing it with the previous lateral cephalogram, and she was referred to this department for additional assessment and management.

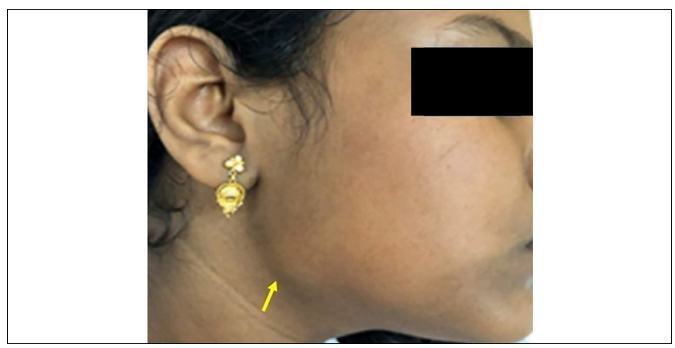

Figure 1: Clinical image showing a swelling located on the angle of the right mandible.

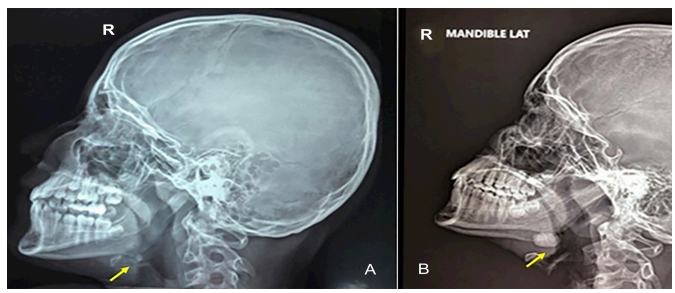

Figure 2: Right lateral cephalogram (A) Two years back (B) Recent at the time of presentation.

She did not recount any incidents of trauma, and her medical, dental, and family histories yielded no relevant information. A general examination of the patient revealed normal vital signs.

Upon local examination, a bony hard swelling measuring approximately 15 × 12 mm on the angle of the right mandible was observed (Figure 1). The swelling was not tender or pulsatile. It was immobile with no adhesions to the skin. The swelling exhibited a smooth surface, and the overlying skin appeared normal with no local rise in temperature. There was no associated paraesthesia.

On intraoral examination, no other obvious bony expansion or vestibular obliteration was evident. The panoramic radiograph displayed a pedunculated radiopaque mass located on the angle of the right mandible (Figure 3). Cone beam computed tomography (CBCT) scan displayed a well-defined higher-density lesion measuring 15.86 × 14.07 × 16.35 mm on the angle of the right mandible. The internal structure was homogeneously hyperdense with a similar density to that of adjacent cortical bone (Figure 4). Routine blood investigations were normal. The first differential diagnosis considered was PO of the angle of right mandible. Osteoblastoma and fibrous dysplasia were also included in the differential diagnosis.

Excision biopsy was performed along with the shaping of the lower border of mandible under general anaesthesia. A single bony mass measuring 16 × 16 × 13 mm was removed. On histopathological evaluation, it showed dense bone with haversian canals, lacunae with osteocytes, resting lines, and bony lamellae suggestive of PO (Figure 5). The patient made an uneventful recovery and had no active complaints since then.

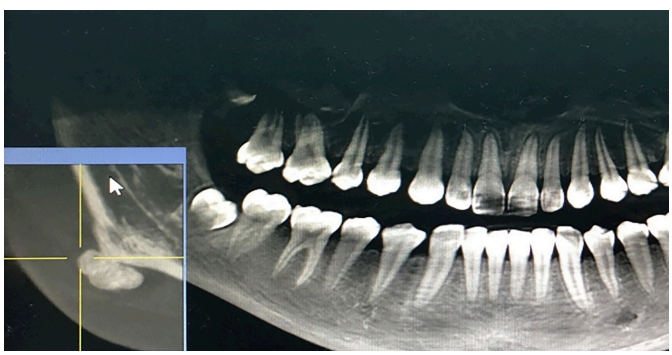

Figure 3: Cropped panoramic radiograph displaying pedunculated radiopaque mass on the angle of right mandible.

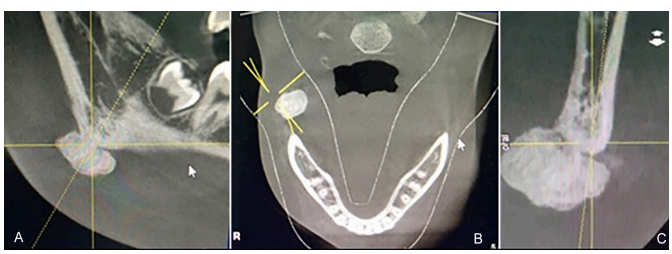

Figure 4: Cone beam computed tomography (CBCT) images (A) Coronal (B) Axial (C) Sagittal view showing a dense bony lesion on the angle of right mandible.

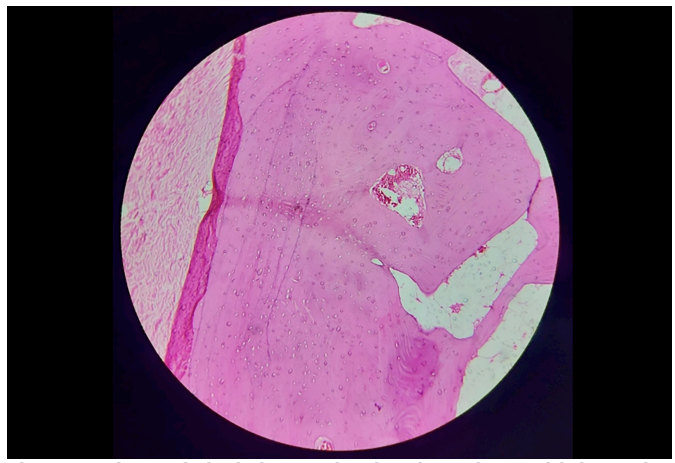

Figure 5: Histopathologic image showing dense bone with haversian canals, lacunae with osteocytes, resting lines, and bone lamellae without any other significant alterations (H&E, ×100).

DISCUSSION

The prevalence of osteoma is low, affecting only 0.01-0.04% of the population, and comprises 12.1% of benign bone tumours and 2.9% of all bone tumours.[5] In 2017, the World Health Organisation defined osteoma as an actual neoplasm consisting of well-differentiated mature bone tissue as opposed to a hamartoma.[6]

PO is the most frequently encountered type of jaw osteoma, with a higher prevalence in the mandible than in the maxilla. Sayan *et al.* reported 22.85% of the osteoma cases in the mandible and 14.28% in the maxilla on-site predilection in the oral and maxillofacial region. Studies by Kaplan *et al.* (81.3%), Chaurasia and Balan (83%), and Woldenberg *et al.* (64%) also were in agreement for the mandibular predilection of osteomas among jaw bones.[7]

The etiopathogenesis of PO has not been described conclusively. Few researchers considered that POs result from developmental abnormalities. However, in many patients, the lesion appears after they pass their growth phase. The neoplastic theory was contradicted by the fact that osteoma proliferates extremely slowly. The latest reactive theory relates osteoma to the occurrence of prior trauma.[8]

Depending on their location and size, osteomas can cause facial deformity, bone pain, and limitation or deviation of the mandibular movements. Osteomas occurring in the paranasal sinuses may lead to headaches, sinusitis, or ophthalmologic manifestations.

Clinical manifestations of central osteomas (endosteal) typically take longer to appear since substantial growth is necessary before expanding the cortical limits. Usually, these lesions do not result in bone resorption or destruction, permitting conservative management approaches such as bone contouring. However, in some cases, the bony mass can grow to enormous proportions, particularly in POs. In such cases, surgical intervention is mandatory, and very few recurrences are reported.[9]

POs are usually easily identifiable due to their characteristic imaging features: Round or oval, radiopaque, well-circum-

scribed, mushroom-like lesions connected to the cortical bone by a wide base or stalk/pedicle, exhibiting distinct borders.[6] The internal structure of the compact variant (ivory osteoma) appears homogenous and uniformly radiopaque while the cancellous type may show evidence of a trabecular pattern. The present case showed typical radiographical features of an osteoma and presented as a homogenous radiopaque mass affixed to the lower border of the mandibular angle.

In histopathology, compact osteoma consists of dense mass of lamellar bone with minimal marrow tissue, and few haversian canals whereas the cancellous osteoma contains trabeculae of mature lamellar bone with intervening fatty fibrous marrow spaces and osteoblasts.[7]

PO should be distinguished from exostoses, osteoblastoma, central ossifying fibroma/fibrous dysplasia, and complex odontoma.[10] Exostoses are bony outgrowths that typically cease growing after puberty, while osteomas may continue to enlarge beyond puberty. The central ossifying fibromas exhibit well-defined borders, and there might be a thin, radiolucent line separating them from the surrounding bone. Osteoblastoma usually presents with pain and demonstrates a more rapid rate of enlargement compared to POs. A complex odontoma manifests as a clearly defined radiopacity located in the tooth-bearing regions of the jaw bone, displaying a density higher than that of normal bone.

The treatment for a large osteoma involves the surgical removal of the entire mass from its base, where it connects with the cortical bone. For osteomas situated in the posterior region of the mandible, extraoral surgery is preferred. The malignant transformation of osteoma and recurrences after surgical removal are exceedingly rare. Nevertheless, periodic follow-up examinations are generally advised following the surgical removal of a PO.

PATIENT'S CONSENT:
Informed consent was obtained from the patient's parents to publish this case.

COMPETING INTEREST:
The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:
NS, PM: Conception and design of the work.
LS NS: Final approval of the version.
SPT: Drafting the manuscript and revising it.
AKN: Revision of manuscript.
All authors approved the final version of the manuscript to be published.

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