CASE REPORT

A 25-year-old man presented with chief complaint of a painless swelling in mandibular lower left back region since 3 years. The lesion was small and increased in the past 3 years to the present size. The clinical examination revealed a firm palpable hard mass, which was fixed to the underlying bone. The swelling is noted on the left posterior part of the ramus of the mandible with no facial symmetry. Intra-oral examination showed a mass of about 5 × 4 cm in diameter and was well circumscribed. Overlying mucosa was intact and normal in color. Based on the patient history and clinical findings, a provisional diagnosis of cementoblastoma, osteoblastoma, ossifying fibroma was given. Orthopantomogram showed a round to oval radio opaque mass with a radiolucent border at the apex of left mandibular 1st molar (Figure 1). The lesion was excised under general anaesthesia and the surgical specimen comprised of both tooth and a hard tissue mass attached to it (Figure 2). Histologically, H and E stained sections revealed both hard and soft tissue mass mainly comprising of bone arranged both in trabecular as well as lamellar pattern with new bone formation and osteoid matrix in a highly vascular connective tissue stroma (Figure 3A and 3B). The lamellar pattern mainly consists of calcified cellular inclusive mainly osteocytes. Based on histopathological findings, the diagnosis of Osteoblastoma was confirmed.

DISCUSSION

Osteoblastoma is a rare benign neoplasm of bone, recognized as separate entity and distinguished from osteoid osteoma. Though Osteoblastoma is considered as benign, the true nature of this lesion is unknown. Jaffe and Lichtenstein suggested that this lesion is a true neoplasm of osteoblastic derivation. Other investigators suggested that it occurs as a result of trauma or inflammation. Smith et al. have regarded this entity as an abnormal local response of the tissues to injury, or even possibly as a localized alteration in bone physiology, rather than as a true neoplasm.

Osteoblastoma seldom involves the jaws and very few cases in the literature have been reported to occur in the jaws. Osteoblastoma may be classified into cortical, medullary, and periosteal types. Osteoblastomas of jaws are either medullary or periosteal and not cortical which are common in extragnathic sites. The mandible is affected more often than the maxilla with most mandibular lesions occurring in the body.

Gordon et al. have shown that 59% of osteoblastomas occur in men and 41% in women. Mandible is affected more often than maxilla and most of the mandibular lesions tend to occur in the body region. Age range varies between 5 years to 60 years. However, the most affected age group remains between 5 and 30 years.

The systematic review of the English-language medical literature of OB of jaws showed only 108 cases published as various case reports as well as reviews. PubMed and Medline search was done using the keywords osteoblastoma, benign osteoblastoma, bone tumors and osteoblastoma of jaws for the review of Literature.

The summary of clinical details such as age, gender, site and symptoms and radiographic findings of the previous cases of OB of jaws in the literature review are enlisted in Table 1. Previous literature reviews had left out few cases in their study and the clinical data of the same had variations. In the present review, an additional 13 cases have been included after the recent review of Literature. Out of 108 cases excluding the present cases, the age range of patient was from 3 years to 78 years with the mean age of 22-23 years. The male to female ratio is almost equal (47% to 53%) with slight increase in females. Majority of the previously reported cases had swelling with pain or tenderness in 64%. Just swelling without any symptoms was noted in 21% of cases. About 10% of cases are asymptomatic and 5% cases have been report-
ed without any details about the nature disease. Eighty-one cases occurred in the mandible (74%) and twenty-nine cases are associated with the maxilla (26%). One case was seen both in the maxilla as well as posterior mandible bilaterally. Of 110 cases, only 54 cases (49%) occurred in the posterior region and 9 cases occurred in the anterior region of both the jaws. However, 47 cases (43%) have not stated the location of occurrence the lesion in the jaws. The radiographic details of review of previous cases showed varied findings. Forty-three cases (39%) had mixed radiolucency and opacities with poorly and well defined borders. Radiolucent lesions were noted in 28 cases (25%) and 22 cases (20%) had radiopaque lesions. The details of radiographic findings in rest of the 12 cases (11%) were not available. All the above discussed data is summarized in Table 2.

DeSouza and Frost reviewed 24 cases of osteoblastoma, dividing their cases into three categories: i) Cortical osteoblastoma-synonymous with ostoid osteoma, showing a circum-

Table 1. Details of English literature review of benign osteoblastoma cases.

| Case | Authors       | Year | Age* | Gender | Location   | Symptom               | Radiographic          |
|------|---------------|------|------|--------|------------|-----------------------|-----------------------|
| 1    | Capodiferro, et al. | 2005 | 16   | F      | Mandible   | Painful swelling       | Mixed Poorly defined  |
| 2    |               | 2005 | 10   | M      | Mandible   | Painful swelling       | Mixed Poorly defined  |
| 3    |               | 2005 | 20   | F      | Mandible   | Painful swelling       | Mixed Poorly defined  |
| 4    |               | 2005 | 21   | M      | Mandible   | Painful swelling       | Mixed Poorly defined  |
| 5    | Rawal, et al.  | 2006 | 30   | F      | Mandible   | Painful swelling       | Radiolucent Well-defined |
| 6    |               | 2006 | 31   | F      | Body of the mandible | Painful swelling       | Radiolucent Well-defined |
| 7    |               | 2006 | 16   | M      | Maxilla, canine premolar | Painful swelling       | Radiolucent Well-defined |
| 8    |               | 2006 | 29   | F      | Body of the mandible | Painful swelling       | Mixed Poorly defined  |
| 9    |               | 2006 | 18   | F      | Body of the mandible | Painful swelling       | Non-description       |
| 10   |               | 2006 | 15   | F      | Body of the mandible | Painless swelling       | Radiolucent Well-defined |
| 11   |               | 2006 | 78   | M      | Body of the mandible | Painful swelling       | Radiopaque            |
| 12   | Angiero, et al. | 2006 | 8    | M      | Right posterior Maxilla | Painless swelling       | Mixed Poorly defined  |
| 13   |               | 2006 | 24   | M      | Left posterior Mandible | Painless swelling       | Mixed Poorly defined  |

Modified and Updated from Almeida Capelozza, et al.10 and Jones, et al.9 reports. F, Female; M, Male. *Age in years.

Table 2. Summary of 108 cases of osteoblastoma of the jaws reported in English literature till date.

| Age             | Age range | Mean age |
|-----------------|-----------|----------|
| Gender          |           |          |
| Male            | n=51(47.22%) |         |
| Age range       | 5 to 78   | 24.04    |
| Female          | n=57(52.78%) |         |
| Age range       | 3 to 53   | 24.42    |
| Location        |           |          |
| Mandible        | 81(73.64%) |         |
| Maxilla         | 28(26.36%)  |         |
| Posterior region| 54(49.09%)  |         |
| Anterior region | 09(8.18%)   |         |
| Not stated      | 47(42.73%)  |         |
| Left side       | 36(32.73%)  |         |
| Right side      | 18(16.36%)  |         |
| Not stated      | 56(50.91%)  |         |
| Symptom         |           |          |
| Asymptomatic    | 11(10%)    |         |
| Swelling        | 23(20.91%)  |         |
| Pain/tender     | 70(63.64%)  |         |
| Not stated      | 6(5.45%)    |         |
| Radiographic description | | |
| Radiolucent     | 28(25.45%)  |         |
| Radiopaque      | 22(20%)     |         |
| Ground Glass    | 5(4.55%)    |         |
| Mixed           | 43(39.09%)  |         |
| Not stated      | 11(10%)     |         |
| No finding      | 1(0.90%)    |         |

Figure 1. Orthopantomogram (OPG) showing a round to oval radiopaque mass with a radiolucent border at the apex of left mandibular 1st molar.

Figure 2. The surgical specimen comprising both tooth and an attached hard tissue mass.

Figure 3. A) Photomicrograph showing Photomicrograph showing osteoid deposition with osteoblastic rimming and rich vascularity; B) Irregular woven bone in lace like pattern within a loose fibrocellular and vascular connective tissue stroma.
scribed appearance and striking perifocal bone reaction; ii) Spongyous osteoblastoma-synonymous with little bone reaction; iii) Periosteal osteoblastoma-synonymous with poorly circumscribed, little bone reaction.

Smith et al., have compared the osteoblastoma in gnathic and extragnathic sites, concluding that the lesion has similar clinical, radiologic and histologic features in both instances.23 Osteoblastoma of the jaws when is associated with the roots of teeth, it is difficult to distinguish from cementoblastoma. Abrams et al. reported that the histologic similarities of cementoblastoma, osteoid osteoma, and benign osteoblastoma suggesting a close relationship among these three conditions.25

The attachment of the tumor to the roots of teeth should not be used as a hallmark for the diagnosis of cementoblastoma as osteoblastoma in the tooth-bearing area may envelop the roots of the involved teeth. However, the broad trabacular regions with limited cellularity seem to be a prominent feature, possibly unique to cementoblastoma.25 Furthermore, reversal lines that may impart a mosaic pattern to the calcified portion are a feature of cementoblastoma.

Osteoblastomas of the jaws are treated by curettage or local excision. En bloc resection is not commonly employed. Radiation should be considered only if surgical removal is not possible and there is evidence of continued aggressive behavior or multiple recurrences.23 Most tumors are curetted and bone grafts are inserted in some cases.

Overall the prognosis of osteoblastoma is good. OB has to be differentiated from other bone producing lesions such as osteoid osteoma, osteosarcoma, cementoblastoma, ossifying fibroma etc.25

Yang C and Qiu WL have reported 24 new cases of osteoblastoma in the maxilla and mandible. Their results suggested that osteoblastomas are more common in females than previously reported. So, the overall percentage of osteoblastoma in females increased from 47.2% to 58.4%.27

Conclusions

Osteoblastoma has to be differentiated from other similar bone producing lesions like osteoid osteoma, osteosarcoma, cementoblastoma, ossifying fibroma etc for correct diagnosis. Complete surgical excision is only treatment available for osteoblastoma with an overall good prognosis.

A correct diagnosis helps in proper treatment planning. Many bone-producing lesions possess some clinical, radiographic or histopathological similarity to osteoblastoma. Understanding and correlating all these features is of utmost importance. This helps in correctly diagnosing and helps in adequate management of this rare entity, giving a good prognosis.

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