Peripheral osteoma of the maxillofacial region. Diagnosis and management: A study of 14 cases

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ABSTRACT

Purpose: The purpose of the article was to present 14 new cases of peripheral osteoma and to evaluate the diagnosis and management of peripheral osteoma of the maxillofacial region with an analysis of the literature.

Patients and Methods: The records of 14 consecutive patients (6 males and 8 females) referred for the management of peripheral osteoma the maxillofacial region were reviewed. Demographic data, location, presenting symptoms, radiographic findings, bone scan, colonoscopy results and surgical management were analyzed. The criteria used to diagnose peripheral osteoma included radiographic and histologic features.

Results: The 14 patients, ranged in age from 13 to 79 years with a mean age of 40.5 years. The lesions were located in the mandible (64%), maxilla (7%), temporal bone (22%) and maxillary sinus (7%). Colonoscopy results performed in 10 subjects were negative. Surgical excision was the treatment of choice with good results. There were no complications or recurrences.

Conclusions: Peripheral osteoma of the jaw bones is uncommon. The post surgical follow-up should include periodic clinical and radiographic studies. Patients with osteoma associated with impacted or supernumerary teeth, should be evaluated for the possible Gardner’s syndrome.

Key words: Neoplasm, osteoma, mandible, maxilla

INTRODUCTION

Osteoma is a benign osteogenic tumor arising from the proliferation of cancellous or compact bone. The osteoma can be central, peripheral or of an extraskeletal type. The central osteoma arises from the endosteum, the peripheral osteoma (= PO) from the periosteum and the extraskeletal soft tissue osteoma usually develops within muscle (1,2). Osteomas are found mainly in the craniomaxillofacial bones. Peripheral osteomas are uncommon. Clinically, the PO is usually an asymptomatic slow growing lesion which can produce swelling and asymmetry. The pathogenesis of PO is unclear. Some investigators consider it a true neoplasm, while others classify it as a developmental anomaly (3). The possibility of a reactive mechanism, triggered by trauma or infection has also been suggested (4). The association between maxillofacial osteomas, cutaneous sebaceous cysts, multiple supernumerary teeth and colorectal polyposis is known as Gardner’s syndrome (5).

The purpose of this study is to present 14 new cases of peripheral osteoma of the maxillofacial area, their diagnosis and management.

PATIENTS AND METHODS

Data collected included age at diagnosis, sex, location, size, presenting symptom, duration of lesion, radiographic features, soft tissue involvement based on CT, bone scan, colonoscopy report, type of operation, microscopic diagnosis and complications.

RESULTS

Fourteen consecutive patients with PO were identified. The clinical features of these cases are presented in Table 1. The patients, six of whom were males and eight females, ranged in age from 13 to 79 years, with a mean age of 40.5 years. The lesions were located in the mandible (64%), in the maxilla (7%), in the temporal bone (22%), and in the maxillary sinus (7%), (Figs 1-3). The size of the lesions, in their greatest diameter, ranged from 1.0 cm to 4.0 cm, with a mean of 1.68 cm. The
duration of the lesion was known in only ten cases and ranged between 2 and 10 years. The presenting symptoms in this series included: facial deformity, recurrent mucosal ulcer, limitation of mandibular movement, local sensitivity and headache. The typical radiographic finding seen on panoramic radiographs or on CT scans, in our patients was that of a well-circumscribed radiopaque mass attached to the affected bone. No soft tissue involvement was seen in our 14 cases. Bone scan was performed in 11 subjects. In 2 subjects, the PO areas demonstrated with increased accumulation of the radiopharmaceutical. Colonoscopy was performed in 10 subjects and the results were normal. Surgical resection was the treatment of choice. The histologic picture in our cases was of mature bone that was either compact, cancellous or a combination of both. There were no recorded complications as a result of the surgical resection. The post surgical follow up was annual clinical and radiographic studies. One patient with supernumerary teeth was referred for evaluation of Gardner’s syndrome and the result was negative.

Table 1. Clinical data on patients with osteoma in the craniofacial region

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age / Sex</th>
<th>Location</th>
<th>Size (cm)</th>
<th>Presenting symptom</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>31/F</td>
<td>Mandible - Lingual body</td>
<td>1.5</td>
<td>Recurrent mucosal ulcers</td>
</tr>
<tr>
<td>2</td>
<td>42/M</td>
<td>Maxillary antrum</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>40/M</td>
<td>Mandible- angle buccal</td>
<td>2.0</td>
<td>Facial asymmetry</td>
</tr>
<tr>
<td>4</td>
<td>68/F</td>
<td>Temporal bone</td>
<td>2.8</td>
<td>Headache and limited mandibular movement</td>
</tr>
<tr>
<td>5</td>
<td>16/F</td>
<td>Mandible- Ascending Ramus</td>
<td>4.0</td>
<td>Limited mouth opening and mandibular deviation</td>
</tr>
<tr>
<td>6</td>
<td>42/M</td>
<td>Temporal bone</td>
<td>2.6</td>
<td>Mandibular deviation</td>
</tr>
<tr>
<td>7</td>
<td>17/M</td>
<td>Mandible- Buccal body</td>
<td>1.2</td>
<td>Local sensitivity</td>
</tr>
<tr>
<td>8</td>
<td>13/F</td>
<td>Mandible- lower border</td>
<td>1.0</td>
<td>Local sensitivity</td>
</tr>
<tr>
<td>9</td>
<td>79/F</td>
<td>Mandible-ridge</td>
<td>1.5</td>
<td>Decubitus</td>
</tr>
<tr>
<td>10</td>
<td>46/F</td>
<td>Mandible-condyle</td>
<td>2.5</td>
<td>Local sensitivity</td>
</tr>
<tr>
<td>11</td>
<td>58/M</td>
<td>Temporal bone</td>
<td>1.2</td>
<td>Local sensitivity</td>
</tr>
<tr>
<td>12</td>
<td>26/F</td>
<td>Mandible lower border</td>
<td>1.2</td>
<td>Local sensitivity</td>
</tr>
<tr>
<td>13</td>
<td>13/M</td>
<td>Mandible lower border</td>
<td>1.0</td>
<td>Local sensitivity</td>
</tr>
<tr>
<td>14</td>
<td>76/F</td>
<td>Maxilla - Buccal to 16</td>
<td>1.0</td>
<td>Local sensitivity</td>
</tr>
</tbody>
</table>

Fig. 1. P.O. affecting the left condylar area. (a) : Panoramic radiograph showing asymmetry in the condyle, coronoid notch and ascending ramus. (b) : Axial CT scan showing a bony mass at the condyl and ascending ramus area.
**Fig. 2.** P.O. affecting the body of the left mandible. (a):Panoramic radiograph showing a “tooth” like radiopaque mass attached to the body of the mandible apical to the second molar. (b): Bucco-lingual reconstruction of an axial CT scan of the mandible showing a radiopaque mass attached to the lower border of the mandible extending toward the buccal aspect. (c): Bone scan demonstrate increased uptake of Tc⁹⁹ᵐ at the body of the mandible, indicating active growth of the lesion. (d) Surgical specimen measures 2.0 x 3.8 cm.

**Fig. 3.** P.O. affecting the right temporal bone. (a): Coronal C.T. showing a radiopaque mass attached to the right temporal bone. (b): Axial C.T. further demonstrates a cortical bone mass with pedunculated attachment.
In the maxillofacial area PO occurs most frequently in the sinuses. The most common site is the frontal sinus, followed by the ethmoidal and maxillary sinuses. PO has also been described in the external auditory canal, and rarely in the temporal bone and pterygoid plates (5,6).

As noted in previous reports in the literature, PO of the jaw-bones is quite rare. These lesions usually appear as unilateral, pedunculated mushroom-like masses. In the mandible, the most common sites are the angle and lower border of the body, locations that are more susceptible to trauma. Also, the location of PO of the jaws is usually in close proximity to areas of muscle attachment, suggesting that muscle traction may play a role in its development (3,4,7).

Though the exact etiology and pathogenesis of PO is still unclear, traumatic, congenital, inflammatory and endocrine causes have been considered as possible etiologic factors (7). Most cases of PO appear to have a very slow growth rate, without significant symptoms. In many cases, the discovery of the PO is an incidental finding. In some of the cases, however, depending on the location, the size of the tumor may cause facial deformity, deviation of the mandible on opening, headache or exophthalmos.

Imaging of PO can be achieved by traditional radiography (i.e.: panoramic radiograph, Water’s view) or by CT scan. The use of CT scanning with 3-D reconstruction makes it possible to achieve a better resolution and more precise localization (8).

Bone scan was not performed routinely in all our patients, but when used, it was able to disclose the physiologic activity of the PO, enabling to determine whether it is a long standing, mature lesion with no further growth, or a relatively young lesion that is actively growing.

Removal of PO is not generally necessary. Surgery is indicated only when the lesion is symptomatic or actively growing. The surgical approach should be case specific. For the mandible there are intraoral or extraoral approaches. The intraoral approach is preferable when possible, mainly for cosmetic reasons. For the maxillary antrum, the sub-labial gingivo-buccal (Caldwell-Luc) approach is convenient. Endoscopic techniques have also been advocated in selected cases (9). For the temporal, frontal and pterygoid plates (5,6).

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There is very little understanding about the nature of PO, and three theories have been proposed: developmental, neoplastic and reactive (1,10). It is unlikely that PO is a developmental anomaly, as most cases occur in adults and not during childhood or adolescence. It is also unlikely that PO is of a neoplastic nature, because of its very slow growth rate. The possibility that PO may be a reactive lesion, possibly to local trauma, is based on the history of trauma prior to the development of the lesion in some cases. However, this can be considered only in sites that are more susceptible to trauma, such as the angle or lower border of the mandible, but not in most of the cases. As many of the PO lesions are located in close proximity to muscle attachment (i.e.: masseter, medial pterygoid, temporalis) , it is possible that muscle traction may play a role in the development of the PO. The combination of trauma and muscle traction was also suggested as a possible mechanism of the pathogenesis of PO.

Patients with PO and supernumerary or impacted teeth, should undergo a work-up for Gardner’s syndrome (5,11). The triad of colorectal polyposis, skeletal abnormalities and multiple impacted or supernumerary teeth is consistent with this syndrome. The skeletal involvement includes peripheral and endosteal osteomas, which are found more frequently in the skull, ethmoid sinuses, mandible and maxilla. Because the osteomas often develop before the colorectal polyposis, early recognition of the syndrome may be in some cases, a life saving event.

Mandibular osteomas may be a genetic marker for the development of colorectal carcinoma (12). Therefore the patient with a diagnosis of mandibular osteoma, suspected to have Gardner’s syndrome, should be further examined to rule out colorectal carcinoma.

REFERENCES