Maxilla and mandible benign lesions: Radiologic Findings and Differential Diagnosis in CT

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Purpose

To present and to describe the CT findings of the benign lesions that affect most frequently the maxilla and mandible, and show the usefulness of this technique in their differential diagnosis.

Methods and Materials

A retrospective study was performed on 124 patients seen in our hospital who underwent surgery for jaw lesions between the years 2006 and 2011 and the biopsies results were different types of benign lesions.

Most patients came referred from Maxillofacial Surgery Department to carry out the CT after seeing a radiolucent or radiopaque area in the orthopantomography.

Some examples of the maxillary benign pathology are presented in CT describing their features to facilitate the differential diagnosis.

Results

Fig. 1 on page 4 shows the frequency of occurrence of the different histological types of lesions encountered in our study and the gender distribution.

Of the 124 jaw lesions studied, radicular cysts Fig. 2 on page 5 were the most frequently encountered lesions, constituting up to 40,3 % (N = 50) of the lesions. The periapical or radicular cyst is the most common odontogenic cyst and results from inflammation secondary to caries or other entities. Asymptomatic and the peak prevalence occurs between 30 and 50 years of age. Typically, infection spreads to the apex (root) of the tooth, leading to secondary apical periodontitis, granuloma, or abscess and, finally, cyst formation. Appears as a round or pear-shaped, well-defined radiolucent lesion with sclerotic borders.

The lesions next in frequency to radicular cysts were dentigerous or follicular cysts Fig. 3 on page 5, constituting 33% (N = 41) of the 124 lesions. Follicular (dentigerous) cyst develops around the crown of an unerupted permanent or supernumerary tooth and is typically diagnosed in patients between 30 and 40 years of age. Identifying the crown of a tooth projecting into the cystic cavity is pathognomonic. Appears radiologically as a well-
demarcated radiolucent lesion except for the crown of the involved tooth and may resorb or displace the adjacent. The border of the lesion may be radiopaque and a follicular cyst may become extremely large, however, the cortical bone is usually preserved.

Keratocysts (N = 20, 16.1%) Fig. 4 on page 6 followed dentigerous cysts in frequency constituting the third most common type of the 124 lesions. Keratocyst is a non-inflammatory odontogenic cyst that arises from the dental lamina. Peak occurence in the 2nd and 3rd decades. Asymptomatic, swelling on occasion and pain from secondary infection. High recurrence rate after surgical enucleation.

Osteoma Fig. 5 on page 7 was the next in frequency constituting 4% (N=5). Benign, slowly growing lesion composed of well-differentiated mature bone with a predominant lamellar structure. Incidental finding or painless hard swelling. Osteomas can occur at any age, but are found most frequently in individuals older than 40 years. They are uncommon in the jawbones being the mandible more commonly involved than the maxilla. CT showed a large, lobulated, well-defined radiopaque mass of bone density.

Ameloblastoma (N=2, 1.6%), odontoma (N=2, 1.6%) and giant cells lesions (N=2, 1.6%) were the next lesions in frequency.

Ameloblastoma Fig. 6 on page 8 is the most common and most clinically significant odontogenic tumor (10% of all tumors in maxillomandibular region). Slowly growing, locally invasive epithelial odontogenic tumor of jaw. High rate of recurrence, but with virtually no tendency to metastasize. Most ameloblastomas occur in the ramus and posterior body of mandible. Usually painless swelling. Typically manifest in 3rd to 5th decade of life and are typically expansile with an osseous shell that represents involved bone. Can perforate lingual cortex and extend to adjacent soft tissues. May appear as well-corticated, unilocular lucent lesion; others are multilocular with internal septa and honey comb or soap bubble appearance. Absorption of the apices of adjacent teeth may appear.

Odontoma Fig. 7 on page 9 is a tumor-like malformation in which enamel and dentin, and sometimes cementum is present. 2 categories - may appear as multiple, miniature, or rudimentary teeth (compound odontoma, younger individuals- most commonly seen in maxillary anterior alveolar bone) or it may appear as amorphous conglomerations of hard tissue (complex odontoma, mainly in the second and third decades of life, mandibular molar and premolar portions).
Giant cell lesion Fig. 8 on page 10 is a localized benign but sometimes aggressive osteolytic proliferation of fibrous tissue with hemorrhage and hemosiderin deposits. Most frequently in posterior mandible in females from 1st to 3rd decades. Uni-or multi-locular, may expand bone.

These lesions were followed in frequency by a single case (0.8%, N = 1) of Adenomatoid Odontogenic Tumor, and by a single case of hemangioma (0.8%, N = 1).

Adenomatoid Odontogenic Tumor is a rare neoplasm characterized by duct formation by its epithelial component. Slowly increasing painless swelling in second decade. Anterior maxilla, especially canine region. Unilocular, expansile, well-demarcated cyst like radiolucent lesion with impacted teeth (canine) and foci of calcifications.

Hemangioma Fig. 9 on page 11 is usually a well-defined soft-tissue structure with well-corticated margins. However, a central hemangioma may also manifest as a multilocular radiolucent lesion. There is often displacement of adjacent structures with root resorption.

Images for this section:
**Fig. 1**

Radicular (periapical) cyst in a 40-year-old woman. Computed tomographic (CT) scan demonstrate a radiolucent lesion at maxilla.

**Fig. 2**
Dentigerous (follicular) cyst in a 53-year-old man. Orthopantomography and CT images reveal a cystic lesion with an unerupted tooth in the left molar region. The crown of the tooth is contained within the lesion.

Fig. 3
Keratoctyst in a 38-year-old man. CT images demonstrate a lobulated cyst lesion with well-demarcated borders within the maxilla.
**Osteoma** in a 20-year-old male.
CT images show reveal a circular, calcified lesion within the left mandibular ramus.

Fig. 5
Ameloblastoma in a 63-year-old woman. Orthopantomography shows a litic lesion at left mandible. CT scan images demonstrate a multiloculated cystic lesion within the left mandible.
**Odontoma** in a 9-year-old. Orthopantomography shows a large radiopaque mass in left maxilla. CT images show a large mass of cortex or enamel density in left maxilla under the maxillary sinus.

Fig. 7
**Giant cell lesion** in a 58-year-old woman.
CT scan (bone windowing) demonstrates a cystic lesion within the maxilla with erosion of the maxilla cortex.

Fig. 8
**Hemangioma** in a 41-year-old woman.
CT scan show a round lesion arising from the left zygomatic-maxillary junction. The inner and outer cortices, although thinned, are preserved. The trabeculae radiate in a spokewheel-type pattern is seen. There is not associated soft tissue mass. lesion within the maxilla with erosion of the maxilla cortex.

![Image](image_url)
Conclusion

Most of the lesions that occur in the maxilla and mandible are benign lesions, and they are often difficult to distinguish from one another with radiography.

The CT is the technique that best studies the size and morphology of these lesions, their relation with dental elements or their signs of aggressiveness. The diagnosis by imaging requires that we bear in mind factors like the patients history and the prevalences of the lesions. All of this make possible to narrow the differential diagnosis.

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