

Ameloblastoma

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Overview

Ameloblastoma is the second most frequent benign odontogenic tumor in the jaw, appearing mostly in the mandible versus the maxilla, as well as posterior versus anterior. It is a locally invasive, slow growing odontogenic tumor that comes about by undifferentiated enamel tissue. Although this tumor is benign in nature, it exhibits aggressive behavior and, while it rarely becomes malignant, it does have the capacity to do so. Although this type of tumor shares some characteristics with other odontogenic tumors, it also has its own subtypes, including solid/multicystic ameloblastoma, unicystic ameloblastoma, peripheral ameloblastoma, and metastasizing ameloblastoma.

Etiology

Ameloblastoma is a benign odontogenic tumor that originates from oral epithelial tissue because, as its name implies, it is linked to the developing cells that lay down enamel during tooth formation (ameloblasts). Recent research indicates that this benign odontogenic tumor may be caused by a genetic mutation, even though the precise etiology of it is yet unknown. It is thought that various cell types, including basal cells, Malassez and Serres cell rests, and other cell types related to the enamel, are impacted when this condition develops. As a result, the location and type of ameloblastoma that develops in the patient's mouth are thought to be determined by the specific cells that are impacted.

Clinical Presentation

Ameloblastoma most commonly manifests as a painless, slowly expanding enlargement of the maxilla or mandible. Most cases of ameloblastoma are unintentionally discovered via radiographs, most commonly because patients experience local pain or paresthesia in the corresponding area. This odontogenic tumor typically appears in the posterior mandibular molar region. In the event that a radiograph was not used for identification, other clinical signs could include tooth mobility, malocclusion, and facial asymmetry. This tumor typically grows in the buccolingual direction, which increases the risk of soft tissue invasion and possible oral bleeding, both of which could cause pain even though the tumor itself is usually painless.

Demographic

While individuals of all ages can be affected by this ailment, patients between the ages of 30 and 60 are the ones who are most likely to experience it. Although males and females are equally susceptible, there have been reports of somewhat greater rates in men. Compared to the maxilla, the mandible sees upwards of 90% of instances. Regarding racial predominance, data from multiple sources show that two distinct racial groupings have higher rates, “This racial differentiation in the relative prevalence of ameloblastoma was elegantly brought out in a systemic review, which documented that the frequency of ameloblastoma was significantly higher in Asian and African hospitals compared to European and American hospitals”. Although the precise reason for certain racial groups' increased susceptibility is unknown, the evidence is clear and abundant.

Biopsy / Histology / Radiographs

To obtain histology information on this condition, two different kinds of biopsies are carried out. One kind of biopsy is a needle biopsy, in which a tiny quantity of tumor tissue is removed after a

needle is introduced into the afflicted area. Secondly, if the needle biopsy yielded insufficient information, an open biopsy involves physically removing a small portion of the afflicted tissue for additional analysis. Histological features vary depending on the type of ameloblastoma present, for example in solid/multicystic ameloblastoma histological appearance can be divided into follicular and plexiform variants. The follicular type has further subdivisions while the plexiform type does not have further subdivisions and involves the basal cells. "The follicular type can be further subdivided into a spindle cell type, an acanthomatous type, a granular type and a basal cell type. The plexiform type contains basal cells arranged in anastomosing strands with an inconspicuous stellate reticulum. The stroma is usually delicate, often with cystlike degeneration." The luminal and mural variations are the two distinct forms of this tumor's unicystic version. The tumor's extent in the luminal version is limited to the cyst's luminal surface, whereas in the mural variation, the tumor is deemed to have spread to the cystic wall. In regards to the other variants and their histological appearance, the desmoplastic form of this condition has stomal features, while the peripheral form has a histology resembling solid/multicystic ameloblastoma. Radiographically, this tumor presents as a radiolucency that is an expansile unilocular or multilocular in the posterior body of the mandible ramus region and has a well-circumscribed "soap" bubble or "honeycomb" appearance. With this condition, root resorption can be detected radiographically and is sometimes linked to malignancy.

Differential Diagnosis

A range of odontogenic and non-odontogenic lesions with similar radiographic characteristics, such as odontogenic keratocyst, aneurysmal bone cyst, odontogenic myxoma, ameloblastic fibroma, ameloblastic carcinoma, ossifying fibroma, giant cell tumors, and a few others, may be included in the differential diagnosis even though ameloblastomas usually have an expansive

multilocular appearance. Given that they both share ameloblastic epithelium, ameloblastic fibroma, ameloblastic carcinoma and ameloblastomas are histologically similar conditions since they primarily are involved with ameloblasts.

Treatment

Treatment options for this problem can vary case by case, but surgery is typically the only surefire way to address it. Treatment options for this condition include radiotherapy, chemotherapy, prosthetics, jaw repair surgery, and removal surgery. However, radical surgery is the most usual choice, and if treatment is not performed correctly or successfully, the recurrence rate is incredibly high. “Standard treatment for ameloblastoma today is radical resection with 1-cm resection margins. Recurrence rates range from 0 to 15%. For more aggressive types of ameloblastoma, such as the granular cell type, even greater resection margins may be required (Hong et al., 2007; Masthan, Anitha, Krupaa, & Manikkam, 2015; Milman et al., 2016; Sham et al., 2009). Conservative surgery including enucleation and curettage yield recurrence rates as high as 55% (Almeida Rde, Andrade, Barbalho, Vajgel, & Vasconcelos, 2016) and is only considered feasible for unicystic ameloblastoma with a luminal growth pattern (McClary et al., 2016)”. Given the large margin of the mandible involved in this disorder, it is only natural that if a patient has had a portion of their jaw removed, they will need jaw repair surgery to reconstruct the lost jaw tissue.

Prognosis

Due to the low risk that an ameloblastoma can develop into a malignancy, the prognosis for this illness is not entirely clear. The risk of malignancy is quite low in ameloblastomas, although it does rise with time. The method of surgical treatment also affects the prognosis, with surgical treatment leading to a better prognosis than no treatment at all.

Professional Relevance

It is crucial for dental hygienists to be well-versed in all forms of pathology that could affect their patients. They should also collaborate with dentists to work together to develop appropriate diagnosis, treatment plans, and anticipated results. If this isn't done, the patient may experience worsening of their conditions, a deterioration in their relationship with their doctors, litigation if therapy is prolonged while the patient still has certain conditions, and more. Ameloblastoma is expansile and can cause soft tissue invasion in the oral cavity, therefore it's critical for the hygienist to identify the disease's clinical signs and get radiographs as soon as possible to learn more.

Citations

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