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Mini Review

Ameloblastoma- Guide to an updated short review on the odontogenic neoplasm of the oral cavity

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ABSTRACT

Ameloblastoma, the word has developed from the very early English words that are— 'Amel' meaning enamel, and 'blastos'— meaning the germ. It is a benign locally aggressive neoplasm originating from the odontogenic epithelium. It is also the most common odontogenic neoplasm in the oral cavity.

1. Introduction

Ameloblastoma is a tumor that is locally invasive in nature and arises from the odontogenic epithelium with no influence on the ectomesenchyme. It usually occurs in the jawbones with a more predilection towards the mandible.[1]

The etiological factors are not known however, the following factors may predispose the formation of ameloblastoma:[2]

1. Any trauma in the oral cavity
2. Viral and other infections
3. Previous inflammation locations
4. Extractions and early removal of tooth
5. Nutritive and dietary factors.[2]

Clinically ameloblastoma is a painless, slowly expanding, elliptical or fusiform, hard bony swelling of the jaw.[3]

Histologically ameloblastomas may be present in several forms such as:

1. Plexform pattern
2. Follicular pattern
3. Acanthomatous pattern
4. Basal cell pattern
5. Granular cell pattern
6. Desmoplastic pattern

Amongst these plexiform and follicular patterns are the commonest.

The World Health Organization (WHO) in 1991 defined ameloblastoma as a benign and locally aggressive tumor with an elevated tendency to recur, comprising of proliferating odontogenic epithelium lying in the fibrous stroma.[3]

The tumor derives from the residual or remaining epithelium of the tooth germ, enamel organ epithelium, epithelium of odontogenic cysts or the stratified squamous epithelium.[4]

Ameloblastoma was first described by Cusack in 1827 where as the term ameloblastoma was coined by Ivey and Churchill in the year 1930.[5]

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2. Classification

According to WHO in 2005 with the latest modifications and amendments made in the year 2017, classified ameloblastoma as a benign tumor with odontogenic epithelium and a mature fibrous stroma exclusive of the odontogenic ectomesenchyme.[3]

-Ameloblastoma is classified into:

1. Multicystic/Conventional Ameloblastoma (also known as Solid Ameloblastoma).
2. Unicystic Ameloblastoma (also known as Cystic Ameloblastoma).
3. Peripheral Ameloblastoma [WHO-2005].

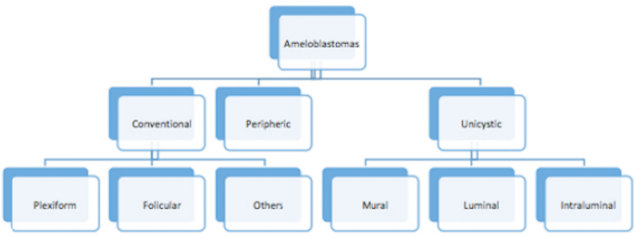

Chart 1: Flowchart with the new classification of ameloblastomas - WHO2017[4]

2.1. Clinical Features

1. Incidence: Ameloblastoma itself accounts for about 1% of all oral tumors. The peak occurrence lies in the third to fourth decades of life whereas the Male: Female prevalence ratio is 1:1.[4]
2. This lesion occurs more commonly in people with a dark complexion and blacks than whites.[4]
3. Site: Ameloblastoma in most of the cases involve the mandible (80%), especially in the molar-ramus area.[5]

2.1.1. Clinical presentation

1. The lesion causes distortion and expansion of the cortical plates of the jawbone which may often lead to gross facial asymmetry. The lesion may also be responsible for the displacement of the regional teeth.[3]

   Most of the patients report a typically long-time history of the presence of an "abscess" or a 'cyst" in the jaw bone that was operated on several occasions but tends to recur after some time.[6]
2. Expansion of the bony cortex occurs due to the slow growth rate of the tumor which allows time for the periosteum to develop a thin shell of bone over it which cracks under digital pressure and produces a characteristic noise known as the "eggshell crackling Noise". This phenomenon is one of the most significant characteristic features of ameloblastoma.[7]
3. If the tumor arises in the maxillary region, the chances of nasal obstruction or a pressure sensation in the orbital region may be felt by the patient due to the invasion and extension of the tumor into the maxillary sinus, the orbit and the nasopharynx.[7]

2.1.2. Radiological features

1. A well-defined, multilocular radiolucency is appreciated in the bone with a typical "honey-comb" or "soap-bubble" appearance.[8]
2. In the radiograph, the lesion typically shows an irregular and "scalloped" margin with sometimes the resorption of roots of the adjoining normal teeth.[7]

2.1.3. Histopathological features

1. Histologically in ameloblastoma, Neoplastic proliferation of the odontogenic epithelial cells (ameloblast-like cells) occurs whereas the nucleus moves away from the basement membrane which is also known as the reverse polarization phenomenon.[7]
2. Histologically ameloblastomas may be present in many forms such as;

   (a) **The follicular variant**- It consists of central portions of the neoplastic islands which are loosely organized resembling the stellate reticulum in a bud stage of a tooth germ. The outer cells are columnar and palisaded having reverse nuclear polarity.

   (b) **Plexiform variant-** It comprises of a thin lamina similar to strands. The cells are frequently grouped in a double row of basaloid shape cells.

   (c) **Acanthomatous variant**- There is central squamous differentiation of the cells due to which it may be mistaken for squamous cell carcinoma or squamous odontogenic tumor.

   (d) **Desmoplastic variant**- There is loss of marginal palisading of the cells with a reverse nuclear polarity which is brought by the tumor cells in the stroma showing desmoplasia.

   (e) **Hybrid type**- It is the mixture of usually two or more variants.[9]

2.1.4. Treatment

The treatment of the ameloblastoma tumor preferably includes resection with safety boundaries and immediate reconstruction wherever and whenever possible.[10]

1. Small lesions are treated by bone curettage through excisional biopsy approach.[10]
2. Multilocular or Unilocular cystic lesions are treated by Enucleation and Bone Curettage and sometimes Marginal Resection.[10]
3. Solid lesions with clear or unclear boundaries are treated by marginal or segmental resection.[10]

3. Conclusion

For the reason that ameloblastoma has a very low prevalence and poor symptoms, it is very difficult to diagnose in the early stages.

It is very important to correlate and associate all the histopathologic findings with the clinical and radiographic features to reach a definitive diagnosis and only then through radiotherapy, surgical approach, or a therapeutic decision could be decided for the needful.

4. Source of Funding

None.

5. Conflict of Interest

None.

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