

## Odontogenic Tumours: Pitfalls in diagnosis

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Most histopathologists will be familiar with the common odontogenic tumours: odontomes and ameloblastoma. Although the large majority of lesions are hamartomatous or benign neoplasms, there are several areas in which the unwary may be tricked into wrongly categorising an odontogenic lesion. The diagnosis of odontogenic tumours is considered complex for good reasons, not only their rarity.

It is important to start with knowledge of normal tooth development and to be able to recognise the various cell types and their extracellular products. The inductive effects between the odontogenic epithelium and neural crest mesenchyme can be seen in many tumours and aids distinction between normal developing tooth, odontomes and more significant lesions. The WHO classification is partly based on these inductive effects. However, it must be recognised that aberrant inductive effects can complicate the picture and that some lesions do not fall into the well-defined categories. This variation has produced a very confused literature and many descriptions of apparently hybrid or new, but not yet accepted, entities, such as adenomatoid dentinoma.

Diagnosis requires clinical and radiographic correlation and a degree of familiarity with dental radiographs and, more recently cone beam CT images. Radiographs usually readily identify malignant variants, but the changes that aid differentiation of benign entities are much more subtle and include internal micromineralisation, recognition of enamel from dentine/bone and associated tooth malformation.

Even within the benign group of lesions there is considerable variation in growth potential. This feature is very important in diagnosis and most usefully separates a group of hamartomatous lesions that are of little clinical significance from histologically similar benign neoplasms with destructive potential; ameloblastic fibroma, ameloblastic fibro-odontome and ameloblastoma. In the absence of good clinical information, collecting previous radiographs is an ideal way to assess growth pattern. It also allows assessment of maturation within the lesion. In general those that develop a more densely mineralised component with time without change in overall size are highly likely to be hamartomatous and stop growing in childhood or early teenage years.

There are a number of classical catches in odontogenic tumour diagnosis. Probably the best known is misdiagnosis of dental follicular tissue or a developing tooth germ as odontogenic myxoma. Similarly, rests of odontogenic epithelium are frequent in the bone of the jaws, as well as around the teeth and these may give suspicion of odontogenic fibroma, especially when they proliferate in response to inflammation in a fibrous hyperplasia. Odontogenic fibroma may also contain areas of giant cell granuloma.

Lesions that are sometimes misdiagnosed as squamous cell carcinoma include the calcifying epithelial odontogenic tumour (Pindborg tumour), squamous odontogenic tumour and desmoplastic ameloblastoma. Sclerosing odontogenic carcinoma is a recently described entity that is probably an odontogenic squamous carcinoma. Confusion with non-odontogenic lesions is also seen with glandular (sialo-odontogenic cyst) and central mucoepidermoid carcinoma.

Case referrals often query ameloblastic fibroma when the stroma is not sufficiently cellular or uniform and over diagnose minor follicular hamartomas, which contain many histological features that are widely but incorrectly thought to characterise specific neoplasms, such as ghost cells.

Surgeons are currently experimenting with conservative treatments for ameloblastoma, making the accurate diagnosis of the unicystic variant important. Similarly, odontogenic keratocysts are more likely to be managed conservatively and this is confused by the, possibly incorrect, reclassification as a benign neoplasm in the recent WHO classification.

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