Regarding the Use of the Term “Cementum” in Pathologic Proliferations

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To the Editor,

Dental cementum is a layer of mineralized connective tissue deposited on the surface of a tooth. When the sheath of Hertwig dissolves during tooth root formation, induction of the formation of cementum follows after contact is established between perifollicular ectomesenchyme and the dentinal surface. In a strict biological sense, application of the term ‘dental cementum’ implies attachment of the mineralized tissue to a tooth surface and there are no other reproducible microscopic, radiological or biochemical criteria to define cementum.

The hypocellular, lamellar, globular mineralized deposits not attached to root surfaces in pathological proliferations are haphazardly referred to as cementoid [1], cementum-like material and psammomatoid deposits [2], curvi-linear deposits [3] or cementicles [4]. Without much reasoning and to the distraught of students of the subject, the prefix “cementum” disappeared and reappeared several times over the past half century in World Health Organization (WHO) classification systems of gnathial and extra gnathial lesions. Although the prefix ‘cemento’ was omitted from ossifying fibroma and osseous dysplasia in the 2005 WHO classification [5], the principle is established in the introduction to the chapter on odontogenic and maxillofacial bone tumours of the 2017 WHO book to reintroduce ‘cementum’ as a preamble to the term ossifying fibroma [2]. Yet where the neoplasm is discussed a few pages further, “ossifying fibroma” appears without the recommended preamble. In the same publication, the term “psammomatoid” is used to label mineralized tissue described as “bearing some resemblance to dental cementum” in extragnathial juvenile ossifying fibromas [2].

Familial gigantiform cementoma (FGC) is the only “cementoma” that survived the terminological conundrum. Initially used by Agazi and Belloni in a case report in 1953 [6], FGC was retained in all the WHO manuals since 1971. Evidence which accumulated in the literature indicates that most cases reported subsequent to the identification of the entity are not familial [7], small lesions in the early stage of growth can barely be described as “gigantiform” and whether the mineralized tissue is indeed cementum, is open to debate as the deposits are unattached to a tooth surface (Fig. 1). The microscopic appearance of FGC’s corresponds to conventional (cemento-) osseous dysplasias (OD’s). Both groups are characterized by a non neoplastic fibro-osseous proliferation. The mineralized component matures at the expense of the fibrous component passing through an immature radiolucent stage, followed by an intermediate mixed stage and ultimately the mature radiodense stage, when growth ceases. The signature macroscopic and radiologic feature of mature FGC and OD is conveniently described as ginger root-like masses and microscopic examination shows globular mineralized masses with minimal fibrous interstitial tissue. Unlike conventional OD’s, FGC’s involves younger patients and have an extended growth phase, which manifests clinically with gross expansion in the protracted early radiolucent stage [7]. Despite the overlap in their microscopic appearances and tendency for the mineral component to mature, FGC is not classified with the more common types of OD. Although a classification should be encompassing, rare variants of FGC’s with systemic abnormalities such as the calcium depletion disorder [8] and bone fragility [9] are not accounted for in any classification system to date. The statement that the microscopic features of FGC’s are ‘analogous to ossifying fibroma’ [2] (a neoplastic growth which does not mature), is confusing and justifies incorrect microscopic interpretations, of which there are several examples in the literature [10].

The term ‘periapical (cemento-) OD’ was inherited from the 1971 WHO classification where it was categorized with

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Fig. 1 An expansive osseous dysplasia with central maturation (M) (which forms confluent ginger root-like masses) surrounded by an immature zone (I) consisting of fibro-osseous tissue with psammomatoid calcifications. Note the separation of the lesion from the tooth (T), periodontal ligament space (Pdl) and inter radicular alveolar bone (B) (H&E stain, X80, bar 100 microns)

FGC as one of the only two types of OD recognized at the time. The term appeared in all classifications since and progressively became descriptive only for OD's located in the anterior mandible. As all OD's irrespective of subtype, develop in the periapical region, the term is obsolete and 'anterior mandibular OD' is deemed more appropriate.

Until cementum has been defined in pathological proliferations, the use of the term should preferably be restricted to mineralized deposits attached to the root surfaces of teeth (such as cementoblastoma and hypercementosis). Dividing the OD's in non-expansive- (conventional, with no- or minimal expansion and generally occurring in patients above the 3th decade of life) and expansive subtypes (the latter replacing FGC, with gross expansive potential and the characteristic clinical and radiological appearances mentioned above) will embrace all the OD's in a unitary classification. This division provides clear guidelines on management, as the approach to the treatment of the expansive group is surgery and the non-expansive types require no treatment unless infected. In the non-expansive group, the term 'periapical

OD' should preferably be replaced by 'anterior mandibular OD.' The term 'FGC' should be abolished and the lesions designated as 'expansive OD'. It is also suggested that the expansive OD's should be divided in the familial- and non-familial subtypes, as well as those with systemic skeletal manifestations.

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