

Title: Bone lesions of the jaws

Address: Pieter J. Slootweg, Dept. Pathology, Radboud University Nijmegen Medical Center
PoBox 9101, 6500 HB Nijmegen, the Netherlands. p.slootweg@pathol.umcn.nl

Maxillofacial bone pathology is complicated because of the presence of bone lesions unique to this area and lesions being derived from the odontogenic tissues. In the current WHO classification (1) an attempt has been made to provide surgical pathologists with a clear outline how to make the appropriate diagnosis in this group of lesions.

This presentation will deal with the lesions that form bone. More extensive details including the entire spectrum of maxillofacial skeletal pathology are discussed in other recent texts (2,3)

Reactive bone lesions occur in 2 different forms. The first are the so-called *tori*. These lesions are outgrowths of the cortical bone. They occur at the palatal midline, or at maxillary and mandibular alveolar ridges. The second group to be mentioned under this heading are the inflammatory diseases. If bone necrosis and pus formation are predominant, one speaks of *acute osteomyelitis*. In case of low-grade infection, fibrosis and bone sclerosis are observed. This *chronic osteomyelitis* has to be differentiated from fibrous dysplasia or osseous dysplasia (see below for distinguishing features). *Osteomas* are lesions composed of compact lamellar bone with sparse marrow cavities filled with fatty or fibrous tissue. They most commonly occur in the frontal and ethmoid sinus; less often, the maxillary antrum and the sphenoid sinus are involved.

Cementoblastoma is the jaw-counterpart of osteoblastoma. This lesion is composed of a vascular, loose-textured fibrous tissue that surrounds coarse trabeculae of basophilic mineralised material bordered by plump cells with ample cytoplasm and large but not atypical nuclei. At the periphery, the mineralised material may form radiating spikes. The hard tissue component of cementoblastoma merges with the root dentin of the involved teeth.

Fibro-osseous lesions include fibrous dysplasia, ossifying fibroma and osseous dysplasia. *Fibrous dysplasia* is composed of cellular fibrous tissue containing trabeculae of woven bone. Maxillary lesions may also show lamellar bone. Activating missense mutations of the gene encoding the α subunit of the stimulatory G protein are a consistent finding in the various forms of fibrous dysplasia. *Ossifying fibroma* is composed of fibrous tissue that contains woven as well as lamellar bone and acellular mineralized material resembling cementum. Its circumscribed nature and variation in cellularity and types of mineralized tissues distinguishes ossifying fibroma from fibrous dysplasia as does the absence of the specific genetic alteration occurring in the latter and mentioned above. Recently identified subtypes of ossifying fibroma are *juvenile trabecular* and *juvenile psammomatoid ossifying fibroma*. The former shows bands of cellular osteoid together with slender trabeculae of plexiform bone lined by a dense rim of enlarged osteoblasts. This lesion may be confused with osteosarcoma. Its favoured site is the upper jaw. The latter is characterized by small ossicles resembling psammoma bodies, hence its name. This type usually is located in the walls of the sinonasal cavities but sometimes can be encountered in the mandible.

Osseous dysplasia occurs in 3 different clinical forms. *Periapical osseous dysplasia* occurs in the anterior mandible and involves only a few adjacent teeth. A similar limited lesion occurring in a posterior jaw area is known as *focal osseous dysplasia*. *Florid osseous dysplasia* is larger, involving 2 or more separate jaw areas and *familial gigantiform cementoma* involves the entire upper and lower jaw while being expansile. This latter type of osseous dysplasia shows an autosomal dominant inheritance. All 3 subtypes have the same histomorphology: cellular fibrous tissue, trabeculae of woven as well as lamellar bone and spherules of cementum-like material.

References

1. Barnes L, Eveson JW, Reichart P, Sidransky D (Eds). WHO Classification of Tumours. Pathology and Genetics of Head and Neck Tumours. IARC Press. Lyon 2005.
2. Slootweg PJ. Chapter 4. Maxillofacial Skeleton and Teeth. In: Cardesa A, Slootweg PJ (Eds). Pathology of the Head and Neck, Springer. Berlin 2006. pp 104-126.
3. Slootweg PJ. Lesions of the jaws. Histopathology 2009, 54: 401-418.