Morphological and Histological Observation of Dental Pulp Calcification

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Abstract: This study attempted to survey the incidence of pulp calcification with age and the histomorphological cause of dead cells or microorganisms, and also to discuss structure and periodontal disease. The observed samples were 122 teeth which were noncarious but condemned for orthodontic or periodontal reasons. The occurrence and morphology of the pulp calcifications were examined with micro CT and then the calcifications were divided into three types: i) round or oval, ii) granule, iii) irregular type, respectively. Electron probe micro-analysis and transmission electron microscopy were mainly employed for the histological observation of each type of calcification. As a result, calcifications in dental pulp were found in about 40% of teeth examined with micro CT. The pathological inflammations caused by bacteria, cell debris, and/or encapsulation of foreign bodies were observed histologically in the dental pulp tissue in which false denticles were found. Furthermore, the processes of irregular types of calcification, which were 1–2 microns flattened oval bacterial-like structures ranging several times, its calcification spreading out into the surroundings, and/or other oval types of calcification consisting of aggregate of 30–40 nm small calcified granules, were observed. Overall results suggested that the bacteria invaded into dental pulp in cases of serious periodontal disease. Useful information for the treatment of complications of dental pulp and periodontal diseases was obtained.

Key words: Calcification in dental pulp, Micro CT, Appearance frequency, False denticle