An internal granuloma investigated by light and scanning electron microscopy

Caries and Periodontitis are not the only reasons why patients may suffer from problems with their teeth. There are far less frequent occuring phenomena causing dental treatment need, which however are of research interest in respect to reason for occurence, origin, progression and treatment options. In this research report we dealt with a dental pulp tissue alteration slowly occuring due to trauma in most of the cases. Such tissue alteration is called internal granuloma as it develops within the tooth as a chronic inflammatory tissue type resorbing the tooth from inside without causing pain. Thus after some time a pink spot may occure on the tooth surface representing the major component of such tissue: blood vessels being addressed to as vascularization. The trauma may be either physical or chemical. In most of the cases it is diagnosed by hazard or, when in case of fracture or mobility, extraction is the only therapy to be performed. If diagnosed in time root canal treatment may be adequate.

In the presented case no single specific event could be determined being the cause of this large internal granuloma extending from the coronal third of the root canal to the whole crown just leaving an eggshell of enamel that fractured and mimicked mobility of the whole tooth to the patient finally causing him to attend the clinic. As the patient presented severe aggressive periodontitis and mobility of all teeth it first was assumed that periodontitis was the ethiological reason in this case. Due to secondary trauma the front teeth were labially positioned thus probably being exposed to traumatic insults more frequently. Clinically the upper right medial incisor appeared discoloured darkly not showing the typical pink spot. Without any force the coronal part of the right medial incisor could be removed manually and the root was extracted. As it was not suitable to leave the patient with a missing tooth in the front the wound was sutured and as a temporary solution the tooth was reconstructed with composite intraorally and fixed to the neighbour teeth adhesively. The internal granuloma was investigated using light microscopy while in case of the crown scanning electron microscopy (SEM) was used.

The tissue within the granuloma showed four characteristic zones. The first zone showed tissue necrosis (dead tissue) within the upper third of the crown pulp, resulting in clinically dark discoloration. The second zone was identified as an area of blazed up inflammation with micro-abscesses. In the lower two thirds of the pulp tissue a third zone, highly vascularized tissue with inflammatory cells was found. The blood vessels were surrounded by connective tissue indicating chronic inflammation. At the pulp dentin border, numerous dentin resorbing cells called odontoclasts were found within the resorption craters. In the fourth zone, the root pulp demonstrated an approximately normal tissue composition with little white blood cell presence, indicating that the tooth was still vital, though it was no longer reacting sensibly to the application of a cold foamed plastic pellet in this case.

An SEM study of the coronal part of the tooth showed deep resorption craters within the enamel

and dentin. While a typical keyhole structure was observed within the enamel, open dentine tubules were identified within the area of resorbed dentin.

Thus this report served to present an internal granuloma within an aggressive periodontitis patient and revealed four zones of tissue alterations within the affected dental pulp and offered SEM images of the typical resorption pattern depending on either dentin or enamel.

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