Aetiology of endodontic failures

Summary / Zusammenfassung
This project is to identify the potential aetiological agents of endodontic failures that occur after proper root canal treatments and to test such factors in experiments so as to establish a cause effect relationship to the disease.

In the first stage of this project root canal treated teeth with non-resolving apical radiolucencies were further treated by periapical surgery. Apical biopsies so obtained were analysed by correlative light and transmission electron microscopy for general features and identification of factors that probably lead to the failures based on radiographic evaluation. Five potential causes have been identified: (1) persisting intraradicular infection; (2) massive accumulation of cholesterol crystals within the lesion, (3) extruded root filling material that excite a foreign-body reaction, (4) cystic nature of the lesion and (5) periapical healing by scar tissue formation which would appear as periapical radiolucencies.

The presence of a potential aetiological agent at the disease site does not imply a cause-effect relationship between the factor and the disease. In order achieve that, further experimental studies need to be conducted in which some of the above mentioned causal agents of failures are tested using a tissue-cage model in susceptible experimental animals. These studies showed that extruding gutta-percha and endogenous cholesterol crystals can induce and sustain chronic inflammatory lesions in experimental animals thereby fulfilling part requirement of the Koch’s Postulates in the classical sense. The survival strategy of Actinomyces radicidentis and their role as a potential agent of endodontic failures have been investigated.

Although cystic transformation of apical periodontitis have been held to be a cause of non-healing apical periodontitis, the genesis of apical cyst was unknown. A hypothesis driven prospective experimental study has conclusively shown that inflammatory cysts develop via the abscess pathway.

Publications / Publikationen


Nair P.N.R, Sjögren U and Sundqvist G.: Cholesterol crystals as an etiological factor in non-


Keywords / Suchbegriffe
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