Influence on Periapical Tissues of Indigenous Oral Bacteria and Necrotic Pulp Tissue in Monkeys

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**Aim**
- The relation between non-infected necrotic pulp tissue & PA tissues.
- Possibility of maintaining necrotic pulp tissue non-infected in root canals for 6 months.
- Main changes in microbial flora of root canals & its capacity to induce apical periodontitis.

**Materials & Methods**
- 9 monkeys (78 teeth) were used in this study.
- Canals were accessed, pulpotomy was performed, teeth were divided into 2 groups and:
  - **Group A**: sealed without exposure to the oral microorganisms (26 teeth)
  - **Group B**: left root canal open for 7 days, then sealed as group A (52 teeth)
- 10 teeth in group A were over-instrumented 3-5mm beyond the apex
- Sampling was performed:
  - **Initial samples**: 6-7 days after closure of the root canal
  - **Final samples**: after 6-7 months
- Clinical and radiographic examinations were performed before and after treatment.
- Monkeys were sacrificed and block sections were taken for histological examination.

**Results**

**Group A**
- None of the samples showed bacteria in the initial or the final samples.
- No inflammatory reactions were observed by clinical or radiographic examination.
- All teeth examined histologically (24 teeth) contained connective tissue in the apical part of the root canal and hard tissue formation on the walls of that part of the canal.
- No resorption of bone or root in teeth instrumented short of the apex.
- 2/10 teeth instrumented beyond the apex showed complete calcific obliteration.

**Group B**
- All samples showed growth of microorganisms; on average 8-15 bacterial strains.
- Obligate & facultative anaerobic bacteria were the most commonly detected microorganisms.
- Some obligate anaerobes were not found in initial samples & were isolated in final samples.
- 12/52 teeth showed pus, abscesses and/or fistula formation.
- 47/52 teeth showed PAR or a widened PDL in the apical region.

**Conclusion**
- Radiographic examination did not reveal all histologically recorded teeth with apical periodontitis.
- No or slight reactions of PA tissues occur when sterile necrotic pulp is present in the root canal.
- Sterility of necrotic pulp tissue could be maintained in all teeth belonging to group A.
- It seems unlikely that contamination of a closed root canal by hematogenous spread under normal conditions would be a significant risk.

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