



## summary

# No difference in outcome at 4 years between surgical and non-surgical endodontic retreatment

Kvist T, Reit C. Results of endodontic retreatment: A randomised clinical study comparing surgical and nonsurgical procedures. *J. Endod* 1999; 12:814–817

**Objective** To observe any systematic difference between surgical and non-surgical endodontic retreatment of endodontic failures.

**Design** Randomised controlled trial.

**Intervention** Ninety-five teeth in 92 patients were randomised to receive either surgical or non-surgical endodontic retreatment and followed up at 6, 12, 24 and 48 months.

**Outcome measures** The proportion that healed (criteria not presented).

**Results** At 12 months a statistically significant higher healing rate was found in the surgical group. This was not present at 48 months. From the data presented the proportion of teeth not requiring further retreatment during the 48 months were ascertained and a number needed to treat calculated (see Table 1).

**Conclusion** There is no difference in the outcome of surgical and non-surgical retreatment at 4 years.

Table 1 Calculation of number needed to treat (NNT) from study

	Non-surgical	Surgical
Patients	47	45
Teeth	48	47
Teeth retreated during 48 months	4	5
– Surgically		
Teeth retreated during 48 months	2	5
– Extracted		
Success at 48 months (%)	87.5 (n = 42)	78.7 (n = 37)
ARR (absolute risk reduction)		0.092
NNT		12

Address for reprints: Thomas Kvist, Gothenburg University, Institute of Odontology, PO Box 450, SE 405 30 Gothenburg, Sweden.

## Commentary

This trial was designed to determine whether non-surgical or surgical retreatment provided a more predictable outcome for a root-canal-treated tooth which failed to heal, an important clinical question which has usually been addressed in uncontrolled retrospective studies. The population studied consisted of endodontically treated teeth which failed to heal: the intervention consisted of either non-surgical or surgical retreatment. The outcome considered was healing of the periradicular radiolucencies present at the start of treatment.

Using a number of described inclusion criteria, 99 'failed' teeth from 96 patients were randomly selected using the 'minimization method' for the non-surgical or surgical retreatment group. In order to better control the variables, only maxillary and anterior teeth were included in the study. The non-surgical group included an array of cases in which crowns, posts, and previous filling materials required removal prior to retreatment. The apical extent to which the retreated root canals were then prepared and obturated is, however, debatable, as is the use of laterally condensed

versus a thermoplasticised obturation technique. In addition, the authors use of chloroform or heat-softened gutta-percha vertically condensed into the root-end preparation rather than a root-end filling material is also questionable. Whether or not tissue specimens from the surgical cases were submitted for histological examination is also not mentioned. To the authors' credit, however, they did attempt to standardise the treatment procedures in both the non-surgical and surgical groups, difficult as this is to do. As expected, the patients, practitioners and post-treatment observers were not blinded to the procedures that were performed.

The completed cases were followed over a 4-year period within which radiographs were evaluated independently for extent of healing by two examiners. The study does not mention, however, whether the two examiners were also the authors of the study, and it appears that inter-evaluator variation was not determined. The results showed that at the 12-month follow-up, there was a statistically significant higher rate of healing in the surgical group, whereas at the 48-month point, no

such difference in healing was observed. The authors did a very good job of accounting for those cases not reported in the results.

Although inconclusive in answering the clinical question as to which procedure is more predictable in achieving a successful outcome and thus providing the practitioner with an evidenced-based treatment, this study goes a long way towards addressing the need for additional randomised clinical trials. It also brings to light the difficulties encountered in controlling the variables inherent in clinical trials in which treatment modalities are compared, and the difficulty in evaluating the outcome measures for determining success. Finally, the authors did address the fact that their cases were managed prior to introduction of microsurgical techniques, ultrasonics and new root-end filling materials.

Jeffrey W Hutter  
Department of Endodontics,  
Goldman School of  
Dental Medicine,  
Boston University, Boston,  
Massachusetts, USA