

# A retrospective study of root canal treatment in the armed forces

*The outcome of root canal treatment. A retrospective study within the armed forces (Royal Air Force) by J. D. Peak, S. J. Hayes, S. T. Bryant, and P. M. H. Dummer Br Dent J 2001; 190: 140-144*

## Objective

The objective of this study was to investigate the outcome of conventional root canal treatment in a general practice setting within the Royal Air Force dental service.

## Design

Retrospective review.

## Methods

Teeth that had been root-filled for 12 months or more by Royal Air Force dental practitioners in patients attending a large Royal Air Force dental centre were included in the study. Following clinical and radiographic review the root fillings were classified as 'definitely successful', 'probably successful' or 'failed'. The effect on success of several variables on the outcome was investigated.

## Results

Out of a total of 406 teeth, 59% were maxillary teeth and 41% were mandibular teeth. Sixty-nine per cent of the total sample had pre-existing periapical radiolucencies. Cold lateral condensation of gutta-percha was the most widely used filling technique (64% of all cases). Fifty per cent of the teeth had root fillings within 2 mm of the radiographic apex, 32% were greater than 2 mm from the radiographic apex and 18% were overfilled. Cold lateral condensation was the most successful (92% overall) filling technique. Maxillary anterior teeth had a better success rate (96%) than other tooth types. Teeth with pre-existing periapical

radiolucencies had a higher success rate (87%) than those cases where there was no pre-existing periapical radiolucency (80%). Root fillings that were less than 2 mm from the radiographic apex of the tooth had a higher success rate (88% overall) than those that were greater than 2 mm from the radiographic apex (77% overall). Of the 406 cases, 57% (n=231) were classified as definitely successful, 28% (n=114) were classified as probably successful and 15% (n=62) were classified as failures. Thus, the overall success rate combining definitely successful and probably successful root fillings was 85% (n=344).

## Conclusions

Root fillings placed using cold lateral condensation of gutta-percha to within 2 mm of the radiographic apex of the tooth were associated with the best outcome.

## In Brief

- Success rates of treatment modalities are an important part of evidence-based practice
- The technical quality of root canal treatment has a major impact on the outcome
- Teeth filled with laterally condensed gutta-percha to within 2 mm of the radiographic apex had the highest success rates

## Comment

Dental surgeons, perhaps more than any other surgical specialists have always been responsible in reviewing their work long-term during routine, 6-monthly recalls. In spite of this activity, sustained over many decades, there have been few data published on clinical outcomes and practitioner performance in the primary care setting. Such reports that exist have often met with hostile or defensive responses by 'coal-face' practitioners unsettled or suspicious of 'ivory-tower' academicians. But such information is key to a responsible, evidence-based healthcare system. We are flooded by new innovation in product and application; what we need to know is how such innovations compare with traditional methods in realistic, primary care situations, not just in specialist clinics, or for that matter on aseptic bench-tops.

This manuscript describes a dispassionate, retrospective appraisal of endodontic practice amongst non-specialist RAF den-

tists. Its intention is simply to define factors associated with clinical and radiographic success in a primary care setting. Data analysis is refreshingly simple and descriptive, with no attempt to blind readers in complex, multivariate analyses of spurious validity.

The key messages are not new, but serve to show that the same issues exist in both the specialist clinic and the general practice. Apical periodontitis is a disease which can respond well to root canal treatment by a variety of techniques. Success is more likely if root canal treatment is undertaken to a high technical standard, with careful length determination, and dense obturation of prepared canals throughout their lengths. Dental educators may be pleased that canals managed in accordance with standard teaching across the developed world (prepared within 2 mm of root-end and densely obturated with cold laterally-condensed gutta-percha) were the most likely to succeed, but

they should not be complacent. Even the small number of cases filled with Endomethasone alone enjoyed relatively high levels of success as defined by this study.

We still have fundamental questions to answer in our management of a ubiquitous disease, apical periodontitis. Perhaps 85% success at 1-4 years is unacceptable in contemporary dental practice. This study provides important baseline data on traditional methods in a primary care setting. It should excite local audit and study groups in NHS, insurance-backed and private practice to construct retrospective and prospective studies on their wealth of clinical data, comparing traditional and 'state-of-the-art' methods. What works, when and how? These are big questions still to be answered.

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