RESEARCH SUMMARY

Contaminated endodontic files in general practice

A study of visual and blood contamination on reprocessed endodontic files from general dental practice

S. Letters,[1] A. J. Smith,[2] S. McHugh[3] and J Bagg[4] ***Br Dent J* 2005; 198: 522–525**

Objective
This study examined methods used for reprocessing endodontic instruments in general dental practice and determined the degree of residual visual contamination and blood contamination on 250 reprocessed files collected from 25 general dental practices.

Materials and methods
A questionnaire was administered to 25 general dental practitioners to obtain information on the re-processing of used endodontic files. Ten files which had been used and reprocessed were also collected from each practice. These were examined visually under a dissecting light microscope for residual contamination and then tested for blood deposits using the Kastle-Meyer test.

Results
Nineteen of the 25 practices used stainless steel hand files. No practitioners used endodontic files as single use devices. Ninety-two per cent of the practitioners discarded and replaced files when they were bent or damaged. Several decontamination methods were reported. The two combinations employed most frequently were manual cleaning and autoclaving or manual cleaning, followed by ultrasonic cleaning and autoclaving. Of the 250 files, 75% showed some degree of visual contamination and seven percent tested positive for residual blood. Blood contaminated files were significantly more heavily contaminated when examined visually. Large variations were found in residual contamination of files collected from practices using the same methods of decontamination.

Conclusions
While all practitioners re-used endodontic files, the variations in decontamination methods reported indicate a lack of clarity on best practice. This study demonstrates that endodontic files are not reliably decontaminated by methods currently employed in dental practice.

IN BRIEF

- Assesses the degree of contamination of endodontic files after reprocessing in a number of general dental practices.
- Each file was assessed for visual contamination and residual blood deposits.
- Seventy-five per cent of files showed visible evidence of contamination and 7% of files had residual blood deposits.
- Endodontic files are not reliably decontaminated using procedures readily available in general dental practice.

COMMENT

The ability to successfully decontaminate re-usable instruments in general dental practice is a fundamental axiom. In this paper cleanliness of root canal instruments following decontamination procedures is examined.

Ten used files from each of 25 general dental practices were examined for signs of residual contamination after undergoing routine decontamination procedures in the practice. The results showed that 75% of the instruments remained contaminated while 7% showed evidence of persistent blood products. Ten practices used hand scrubbing followed by steam sterilisation in an autoclave and seven practices employed hand scrubbing and ultrasonic cleaning followed by steam sterilisation in an autoclave. The latter was shown to be significantly more efficient in rendering files clean. However, when residual blood contamination was used as an end point no significant difference was noted between manual and ultrasonic cleaning. While it has been highlighted that the risk of contracting vCJD from dental procedures is low, it is disturbing to discover that the levels of decontamination were so poor. This is even more unsettling when it is clear that the practices used in the study are almost certainly progressive and enthusiastic as all are part of a research consortium in primary dental care set up in the West of Scotland a few years ago.

Of course endodontic instruments are constructed with complex geometry and by their nature may be difficult to clean. While some instruments have been manufactured for single use, many are re-used, especially if no noticeable physical damage has occurred. None of the practices in the study regarded files as single use devices. Some endodontic files, especially those manufactured in nickel titanium, are expensive and this, combined with the manufacturers' current inability to produce the numbers of instruments required if all were to be single use, means that instruments will be re-used. This universal problem has been addressed elsewhere and a decontamination programme reported by Parashos *et al.*[1] appears to be satisfactory, resulting in 100% clean surfaces, although this study did report only on visual criteria rather than the blood and protein assay in the current paper. However, it seems also that ultrasonic cleaning can be impaired if files are placed in the wrong type of container.[2]

This current research has important implications for the decontamination of other instruments including extraction forceps, where the hinge may be contaminated with blood, and periodontal hoes. Guidelines for best practice must be developed and instituted to ensure that decontamination is consistently and maximally achieved.

In addition, if further work indicates that all endodontic files should be single use only, then the remuneration for root canal treatment will require adjustment.

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1. Parashos P, Linsuwanont P, Messer H H. A cleaning protocol for rotary nickel-titanium endodontic instruments. *Aust Dent J* 2004; **49:** 20-27.
2. Van Eldik D A, Zilm P S, Rogers A H, Marin P D. A SEM evaluation of debris removal from endodontic files after cleaning and steam sterilization procedures. *Aust Dent J* 2004; **49:** 128-135.

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