The Impact of Instrument Fracture on Outcome of Endodontic Treatment

**Aim**
- To determine the frequency of fractured endodontic instruments left in the root canal following treatment.
- To assess the influence of endodontic instrument fracture, in particular rotary NiTi, on the outcome of RCT and retreatment.
- The hypothesis was that a retained instrument fragment does not influence post-op healing.

**Materials & Methods**
- This study was divided into 2 parts:
  - **Part 1**: A retrospective survey of 8460 cases, treated non-surgically over 13.5 yrs. by 7 endodontists, to determine the prevalence of retained fractured instruments following treatment.
  - **Part 2**: Outcome analysis of equivalently 146 matched cases, taken from the pool of cases of part 1, differing only by the presence or absence of a retained fractured endodontic instrument, which were followed up for 1 yr.

**Results**
- The prevalence of retained fractured instruments was 3.3%.
- Overall healing rate for teeth with retained fractured instruments was 91.8% vs. 94.5% for matched cases.
- Healing in both groups was lower in cases with pre-op PAR (86.7% vs. 92.9%).
- There was no statistically significant difference between the 2 groups with or without PAR.
- There was no consistent pattern of declining fracture rate with increasing yrs. of experience.
- The frequency of rotary NiTi instrument breakage was significantly more than hand files.

**Conclusion**
- In the hands of experienced operators, endodontic instrument fracture, particularly rotary NiTi, had no adverse influence on the outcome of nonsurgical RCT and retreatment when the instrument remained in the root canal.

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