

Audit Of Root Canal Obturation By Undergraduates In Plymouth University Peninsula School of Medicine and Dentistry Based On Radiographic Outcomes



Angharad Truman (Specialist Trainee Registrar Restorative Dentistry), Ewen McColl (Consultant Restorative Dentistry), Matthew Jerreat (Consultant Restorative Dentistry).

Introduction:

An audit to assess the outcome of undergraduate Root Canal Treatment (RCT) had not previously been undertaken in the dental school. It was important to assess the quality of treatment provided as this could be utilised as a method to assess for possible improvement and aid further teaching.

Aim:

To assess the quality of Root canal (RCT) obturation performed by undergraduate dental students in Peninsula Dental School based on radiographic outcome.

Criteria and standards

- The criteria is based on the recommendations from the consensus report of the European Society of Endodontolog.⁴
- The standard was set by an agreed consensus of restorative consultants.

| Criteria | Standard |
|---|----------|
| Accessible RCs should be treated | 100% |
| No signs of iatrogenic damage | 90% |
| Root canal filling material should be within 2mm of radiographic apex and not over extended | 90% |
| The obturation should be well condensed with no voids | 90% |
| Overall quality of RCT should be acceptable | 90% |

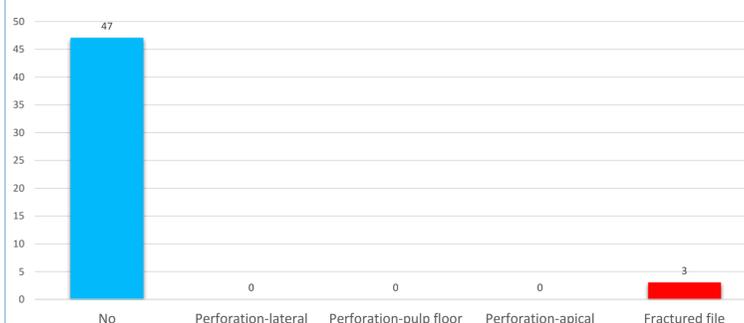
Methodology:

- A protocol for assessing the radiographic outcome of root canal treatment was devised. This was based on the consensus report of the European Society of Endodontology.⁴
- Data was collected retrospectively covering a 1 year period (Feb 2014-Feb 2015).
- The data was examined by a consultant in restorative dentistry and an StR in restorative dentistry .
- Exclusion criteria: no post operative radiograph present , root canal treatment was still ongoing/unfinished, tooth extracted prior to completion
- Cases were selected from a database of completed RCT from SOEL Health
- 50 Radiographs assessed

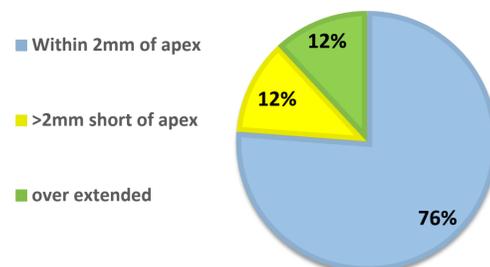
Results

- 44% of teeth were multi-rooted
- 6% Re-RCT
- 98% Pre-operative radiographs had apical pathology present
- 100% of root canals visible were treated (84 individual RCs in 50 teeth)
- 100% of post obturation radiographs present

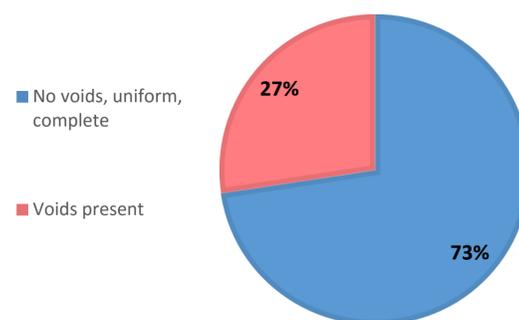
BAR GRAPH SHOWING THE SIGNS OF IATROGENIC DAMAGE DURING RCT



A PIE CHART SHOWING THE LENGTH OF OBTURATION OF INDIVIDUAL ROOT CANALS



PIE CHART SHOWING THE QUALITY OF OBTURATION



OVERALL QUALITY OF RCT

| | | |
|--------------------|----|-----|
| Satisfactory RCT | 14 | 28% |
| Adequate RCT | 32 | 64% |
| Unsatisfactory RCT | 4 | 8% |

| Criteria | Standard | Result |
|---|----------|--------|
| Accessible RCs should be treated | 100% | 100% |
| No Signs of Iatrogenic Damage | 90% | 94% |
| Root canal filling material should be within 2mm of radiographic apex and not over extended | 90% | 76% |
| The obturation should be well condensed with no voids | 90% | 73% |
| Overall quality of RCT should be acceptable | 90% | 92% |

Conclusions:

- The overall standard of RCT provided by students at Peninsula dental school is very favourable when compared to the literature.
- In this audit root canal obturation was assessed as acceptable in 92% of the cases, when compared to other studies showing this to be the case in 79.4%², 55.3%², 13%³, 63%⁵.
- This audit showed improvements could be made to achieve the standards set in relation to the length and quality of obturation.
- Iatrogenic damage was found in 6% of cases. It is worth noting operator experience was not assessed or the difficulty of the RCT assessed.

Notable Comments:

- Initial working length radiographs were often inaccurate or master cone radiographs were not taken in cases of inaccurate final obturation of the RC.
- The use of apex locators was not taken into account when assessing obturation length. Furthermore, Practitioner experience or difficulty of the RCT was not taken into account.
- Data was collected from SOEL health records of completed RCTs only. Therefore, if a tooth required extraction during this procedure it would not have been assessed.
- It is important to highlight that success of RCT can not solely be judged on radiographic outcome alone.

Suggestions for improvement:

- Further teaching and advice on use of apex locators and obturation techniques. This will be done at 6 weekly supervisors meetings.
- Further analysis of cases not meeting standards and how this can be improved on.
- Working length and master cone radiographs should be taken 100% of the time.

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