Practical Restoration of the Root Filled Tooth - Reciprocation / Obturation / Post Preparation / Cementation / Core build ups – SL 22nd April Feb 2016 - LonDEC
Some sensible practical **Tips and Messages** on the Prosthodontic management of the RCT’d Tooth

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Let’s look at Posterior RCT’d teeth
Practical Goals

• Cut back GP to leave 5mm of GP in the root canal receiving a post (GG burs and post drills)
• Size and ‘mushroom off’ an appropriate impression post
• Cement a post(s) with spiral filler and pump prime the post into seated position
• Build up composite core to direct post
• Create Nayyar core
Cuspal Protection of RCT’d Posterior Teeth

Where’s the damage done – by the endodontics?
Cuspal Protection of RCT’d Posterior Teeth

Where’s the damage done – by the size of cavity?

Restorative Procedures Followed by Endodontics
Reeh et al (1990)
Cuspal-Protection of RCT’d Posterior Teeth

- *where’s the damage done?*

Removal of the marginal ridges is the main problem for root filled posterior teeth
Clinical performance of RCT posterior teeth just restored with intra-coronal amalgams

Hansen et al. (1990) - In vivo fractures of endodontically treated posterior teeth restored with amalgam

- MO/DO survive better over 20 years than MOD.
- 73% of MOD on premolars failed by 20 years

**Conclusion:** RCT’d posterior teeth with MOD restorations should have cuspal coverage of at least 2-3mm of amalgam or a casting
As DFs do you enjoy this type of work?
Other than UDAs - What’s going through your mind here? What should we be doing for these teeth (and why)? Do you find this type of dentistry difficult?
What would you do next? (Nayyar 1990 & 1991)

Arun Nayyar cores – a god send
Cuspal protection of LR567?
Have I done the right thing and will it be difficult to maintain in the long term?

1992 - 2015?
Terminal abutment – dental team needs to bring in their ‘A game’

Foundation (perio / endo), core design, preparation, impression, static jaw registration, temporisation, crown construction, cementation and adjustment and polish
Agreed Team (Band) Standards

E-max Monolith UR6 – single strategic RCT’d tooth
Posteriorly you only need to use a post when there is inadequate coronal tooth structure to support & retain a coronal cuspal-protection restoration.
Do we do posts well?

Good or Bad?
Grieve & McAndrew (1993)

- Radiographic examination of 327 post-retained crowns
- 20% had deviated posts
- 10% had no root filling
- 50% inadequate RCT
- 47% had radiolucent areas
- 74% of posts tapered
Parapost burs create significant greater deviations from the centre of canals than Gates Glidden (Gegauff et al 1988). Therefore safest to use of non-end cutting rotary instruments (e.g. GGs) first to remove (mostly by heat) the GP and then prepare / cut a post channel within the root.
Never use the post drill first
In a multi-rooted tooth use only one root canal
Metal or Glass-Fiber?

Long-term survival of endodontically treated, maxillary anterior teeth restored with either tapered or parallel-sided glass-fiber posts and full-ceramic crown coverage.

Signore A1, Benedicenti S, Kaitsas V, Barone M, Angiero F, Ravera G.

Abstract

OBJECTIVES: This retrospective study investigated the clinical effectiveness over up to 8 years of parallel-sided and of tapered glass-fiber posts, in combination with either hybrid composite or dual-cure composite resin core material, in endodontically treated, maxillary anterior teeth covered with full-ceramic crowns.

METHODS: The study population comprised 192 patients and 526 endodontically treated teeth, with various degrees of hard-tissue loss, restored by the post-and-core technique. Four groups were defined based on post shape and core build-up materials, and within each group post-and-core restorations were assigned randomly with respect to root morphology. Inclusion criteria were symptom-free endodontic therapy, root-canal treatment with a minimum apical seal of 4mm, application of rubber dam, need for post-and-core complex because of coronal tooth loss, and tooth with at least one residual coronal wall. Survival rate of the post-and-core restorations was determined using Kaplan-Meier statistical analysis.

RESULTS: The restorations were examined clinically and radiologically; mean observation period was 5.3 years. The overall survival rate of glass-fiber post-and-core restorations was 98.5%. The survival rate for parallel-sided posts was 98.6% and for tapered posts was 98.6%. Survival rates for core build-up materials were 100% for dual-cure composite and 96.8% for hybrid light-cure composite.

CONCLUSIONS: For both glass-fiber post designs and for both core build-up materials, clinical performance was satisfactory. Survival was higher for teeth retaining four and three coronal walls.
Metal or Glass-Fiber?

• The less tooth-tissue you have remaining – the more you need an indirect core
• Survival better for glass fiber posts and all ceramic crowns if you have 3 or 4 remaining walls of tooth tissue
• If you have less go for an indirect arrangement and optimise ferrule
The amount, height, thickness & ferrule of remaining tooth structure is the most important factor on outcome - much more so than the type & length of post and the type of core.
What about the anterior RCT’d Teeth?

• Anterior teeth do not require occlusal protection

• Prepare the tooth first and then decide if a post is required for crown retention
Post and Crowns – a team game

Initially cut back GP with GG burs to reduce risk of deviation. Leave at least 5 mm of apical GP (but the longer the RCT the better in terms of reducing leakage (Mattison et al 1984). Place adhesive on the impression post and ‘mushroom–out’ the end to reduce risk of ‘pull-out’ from the impression.
Post Seating & Cementing – often needs time and should be done carefully.
Why is cementation and passive seating of posts so important?
The ‘Moshonov’ Gap to be avoided


The effect of the distance between post and residual gutta-percha on the clinical outcome of endodontic treatment.

Moshonov J¹, Slutzky-Goldberg I, Gottlieb A, Peretz B.

Abstract
To determine whether the distance between the post and the residual gutta-percha influences the clinical outcome of endodontic treatment, 94 endodontically treated teeth following post and core restoration were evaluated radiographically. The teeth were divided into three groups: (I) no gap between the gutta-percha and the post; (II) a gap of >0 to 2 mm; (III) a gap of >2 mm. Treatment outcome was evaluated in follow-up radiographs, taken 1 yr after treatment and up to 5 yr posttreatment. In group I, 83.3% of the teeth were evaluated normal, 53.6% of group II, and only 29.4% of group III. A gap between the gutta-percha and the post was related to an increased rate of emerged disease in endodontically treated teeth restored with a post and core.
Greater risk of periapical infection when there is a radiographic space between the root filling and the post (Moshonov et al 2005)

No Gap - 83.3% PAH normal
GAP 0-2mm - 53.6% PAH Normal
GAP greater than 2mm - 29.4% PAH Normal
We need to get the cement right down the root and not just place on the post to wipe up coronally when you insert the post!

The only time to safely use a spiral Filler
Assuming the root intact, no deep localised pockets and treatment done well (5mm GP / decent post and crown) then one is looking at a very high survival of single and multi-rooted teeth supporting single fixed restorations (Salvi et al 2007).

Creugers and Mentink

The amount, height, thickness & ferrule of remaining tooth structure is the most important factor on outcome - much more so than the type & length of post and the type of core.
Agreed Team (Band) Standards for dentist, nurse, technician

- Flash of impression material around the tooth/teeth
- No ‘blows’ in essential areas (e.g. margin)
- No drags in essential areas
- Support for the impression material especially distal to tooth

Impression Standards
Post Cores & Crowns – foundation skills, cut back of GP, optimise ferrule, good impression-taking, temporisation (protect root filling) 3D cementation – Team Work

**Good or Bad?**
Grieve & McAndrew (1993)

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- **74%** of posts tapered
Predictable Stuff

• Good endodontic and periodontal health
• Good ferrule
• Good post fit
• No gaps
• Single teeth
• Favourable loading
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