‘Hands-on’ Posterior Tooth Preparation

Practical Skills Courses, SWL, 25/11/2016
‘Hands-On’ Didactic Teaching
‘A Tooth-Friendly-Approach’
- Hands-on Tooth Preparation Course -

Dental Simulation

to include:
Posterior Full Veneer (shell) Crown – Cast precious or non-precious metal alloy
Posterior Adhesive Metal Hat
Provisional crowns
Posterior Zirconium Monolithic or PFM
Plastic Teeth – we have lots to practice on
PFM ‘winged’ Preparation

Preparation Specifications:

- Incisal Reduction: 1.5-2.0mm
- Labial Shoulder: 1.0-1.5mm
- Palatal Chamfer: 0.5mm
- Palatal Reduction: 1.0mm Metal
  2.0mm Metal/Ceramic
• We started with an anterior Porcelain Fused to Metal Crown – as it still accounts for more than 90% of all prescribed crowns in the UK
Tasks today
The FGC preparation is very challenging!
• Invest in your skills – know your shortcomings – know how to improve them – most of us need around 2000 hours of experience to develop high level reproducible practical skills
• Cut no corners today
• Remember - no easy way to achieve quality dentistry
• Do your best and you will enjoy the challenge
• Self challenge and reflect – why is it not good?
Rules of the Day

• We all need to work hard – the tax payer is paying
• We are using plastic teeth – you now how to handle them
• We are using 3 striper bur sets
• I want the focus to be on quality hand piece control, attention to detail and craft precision
We will not ask you to do anything that we cannot
Rules of the Day

• Reflection on where you are and what you need to improve
• Get feedback from us and your colleagues
• Enjoy the day and have fun but please reflect on what you have done
Need to know dimension of the burs we are using and thickness of rounded tip!
We will all use a Putty Index
I look at them like implant stents (diastema OI case – you need precision)
FGC prep can cause dentists many problems
Cast Metal Posterior Conventional Crown Preparation Specifications:

Occlusal Reduction: Non-Functional 1mm
Functional Cusp - 1.25 - 1.5mm

Margin: Chamfer 0.5 – 0.7mm supra-gingival
2 plane labial reduction

Adequate interdental clearance for technician

Taper: 7º taper & no undercuts
Objective Assessment of: **Margin**

- Depth – 0.5 - 0.7mm
- Consistency for chosen material
- Smoothness – why?
- Position relative to gingival margin
Objective Assessment of: **Taper**

- 7 degree taper per wall
- 14 degree convergence taper
- No undercuts
- Smooth walls
Objective assessment of: **Axial reduction and undercuts**

Use sharp pencil at each of the four line angles to check for undercuts.

If you can see all four then no undercuts – if not you have an undercut.
".....Give me the surgeon who does the correct operation rather than the one who skilfully performs the wrong one....."
Objective Assessment of: **Occlusal Reduction**

- Depth – Consistent for chosen material
- Maintain anatomical form
- Function cusp bevel
- Confirm with putty index
Objective Assessment: **Occlusal Reduction**

Keep the position of the:
- **Central Fossa** – middle of tooth
- **Cusp and cusp tips** – similar position as pre-prepared tooth

*PB 2011*
Objective Assessment: **Occlusal reduction**

Keep the position of the:

**Central Fossa (mesial to distal) – middle of tooth**

**Central Fossa (buccal to lingual) – similar position as pre-prepared tooth**

This will ensure that your cuspal anatomy will be in the correct place on the tooth
Objective Assessment: Occlusal reduction

Keep the position of the:
Central Fossae
Cusp and cusp tips – similar position as pre-prepared tooth
This will ensure that your cuspal anatomy will be in the correct place on the tooth
Critique

- Taper
- Undercuts
- Reduction
- Occlusal form / anatomy
- Margin depth
- Margin height
- Overall shape
Self-Reflection

- Very rough generally – want to see better from you all
- Taper(s) OK
- 2 plane reduction OK
- No undercuts
- Occlusal anatomy maintained
- Functional cusp bevel not pronounced enough
- Margin depths OK but to near the gingival tissues
- Interdental clearance fine
Self-Reflection

- Much smoother generally – but could be better
- Taper(s) OK
- 2 plane reduction OK
- No undercuts
- Occlusal anatomy maintained
- Functional cusp bevel not pronounced enough
- Margin depths OK and good position in comparison to the gingival tissues
- Interdental clearance fine
Go on and do a Full Gold or Cast Metal Full Veneer Crown Preparation
5-1  Occlusal reduction: Round-end tapered diamond or No. 170 bur.

Fig. 5-2  Functional cusp bevel: Round-end tapered diamond or No. 170 bur.

5-3  Buccal and lingual axial reduction: Chamfer diamond.

Fig. 5-4  Proximal axial reduction: Short tapered and chamfer diamonds.
Full Gold Crown Preparation

- 0.5-0.7mm margins (0.5mm supragingival)
- Occlusal clearance: 0.7-1mm (non functional cusps) 1.25 (functional cusps)
- Maintain occlusal anatomy and central fossae & cuspal form
- 7 degree wall taper - no undercuts
- 2 plane buccal reduction
- Good clearance of interdental preparation margins with the neighbouring tooth/teeth
- Smooth margins and walls
- Verification of dimensions with putty index
RESIN RETAINED CAST METAL CUSPAL COVERAGE RESTORATION

• The design does not need to incorporate features of resistance or retention form as the retention is derived from bonding with an adhesive such as Panavia
• No need to break interproximal contact if sufficient bonding area
• No need to remove existing restorations – clinical and radiographic assessment is necessary
• Still need maintenance of occlusal anatomy – position and form the fossa and cusp tips must remain
Enamel margins, supra-gingival & able to control GCF
Preparation Specifications

• Externally similar to FGC preparation except that the restoration margins are positioned occlusally
• Occlusal Reduction:  
  1.0mm Non-Functional  
  1.25mm Functional  
• Axial Chamfer: 0.5mm  
• Functional cusp bevel  
• Margins positioned 1.0 - 2.0mm from occlusal surface if there is sufficient enamel for bonding.  
• Contact points are left intact unless a proximal restoration is present or teeth very worn  
• Margins are finished on sound enamel
Adhesive Cast Metal ‘Hat’

- Externally similar to FGC preparation except that the restoration margins are positioned occlusally.
- Occlusal Reduction: 1.0mm Non-Functional, 1.25mm Functional.
- Axial Chamfer: 0.5mm.
- Functional cusp bevel.
- Margins positioned 1.0 - 2.0mm from occlusal surface if there is sufficient enamel for bonding.
- Contact points are left intact unless a proximal restoration is present or teeth very worn.
- Margins are finished on sound enamel.
• Can use a rugby ball bur to do most of the work
• Preps are therefore very quick
• Cementation and fit the key time commitments
• You are using adhesive dentistry / bonding – so moisture control is King
Minimal Tooth Preparations:

Suggestions

- No retention / resistance grooves
- Minimal inter-occlusal preparation
- No ‘offsets’ / bevels
- Preservation of enamel with supra-gingival margins whenever possible
Minimal Occlusal Coverage Preparations:

Suggestions

• Only take out interdental contacts if inadequate tooth material present above contact points to retain and stabilise future restoration (i.e. very short teeth)

• No sharp angles and rounded internal angles important for ceramic restorations
Minimal adhesive posterior tooth preparations:

(Chana et al 2000)

- No retention / resistance grooves as pre-cementation retention has no relevance to cemented performance (Osman et al 2010)
- Minimal interocclusal preparation
- No ‘offsets’ / bevels
- Preservation of enamel with supra-gingival margins whenever possible (Briggs et al 2002)
Minimal Adhesive Occlusal Coverage Preparations

- More reliance placed on adhesive retention
- Enamel at the margins - very important
- I feel as long as enamel at periphery then can afford to have much exposed dentine / existing restorative material present
Practical Issues: Adhesive Dentistry for posterior teeth

Will keep the future options open as you do not need conventional retention / resistance forms of tooth preparation – but is more fiddly at the cementation appointment - you need enough tooth tissue to bond to and good moisture control.
I accept that temporisation is more difficult as less has been taken off the teeth and there is little IO space

- Need to be more flexible
- Over - contour for extra strength e.g. overlap buccal / lingual areas and consider the use of a more adhesive cement e.g. Poly F
- It would be a shame to avoid these type of restorations on behalf of more difficult temporisation
Temporary Crowns

• **Direct**

• Indirect – where you are dealing with more teeth – diagnostic wax up – pre-planned Provisionals – used to diagnose function / occlusion and appearance
Temporisation
Temporisation of lower incisors

where there are several teeth fuse the temps together it makes sense
Go and enjoy the day