



THE UNIVERSITY OF
**WESTERN
AUSTRALIA**



Oral Health Centre
of Western Australia

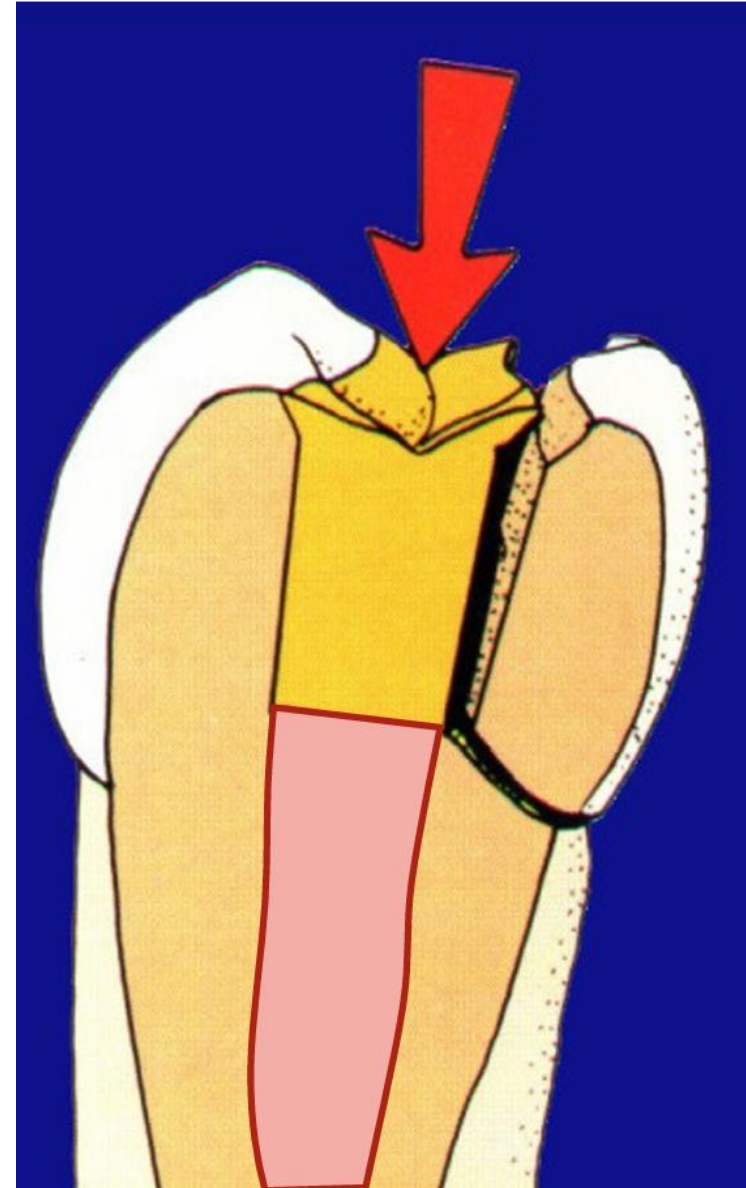


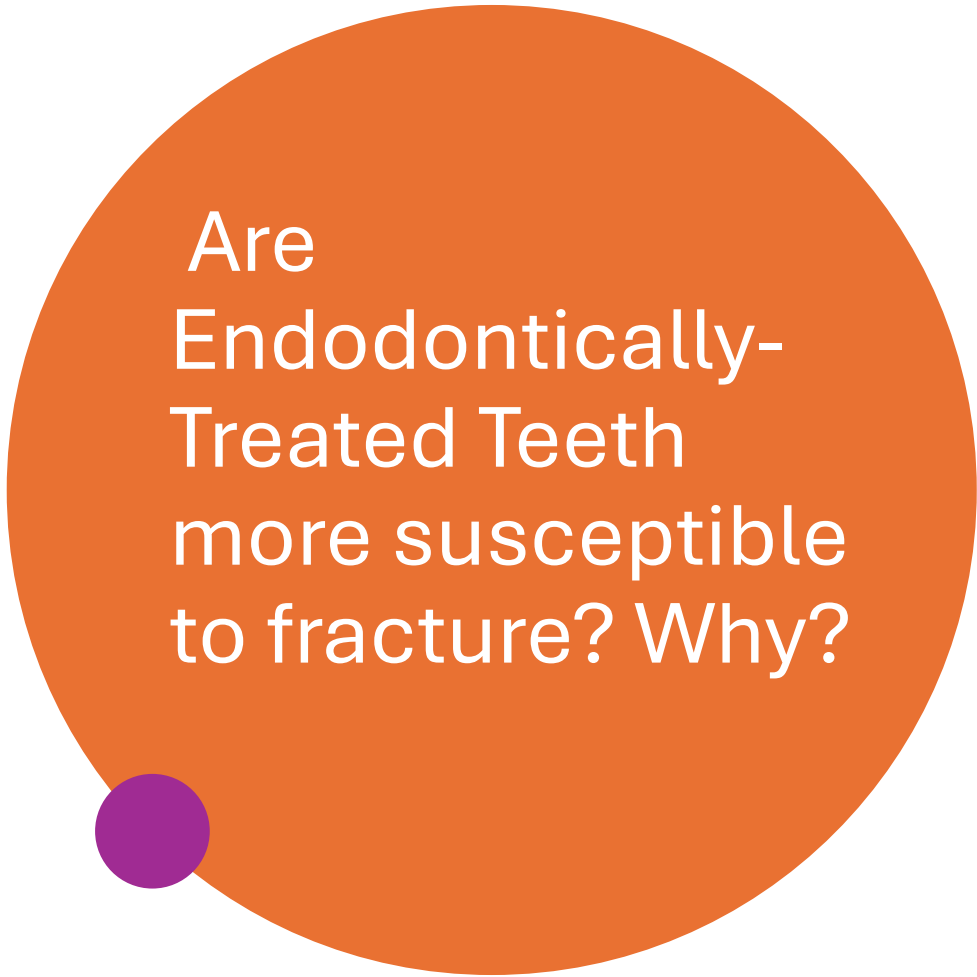
RESTORATION OF ENDODONTICALLY TREATED TEETH

Dr. Marrwa Ibrahim




Are Endodontically-Treated Teeth more susceptible to fracture?...and Why?

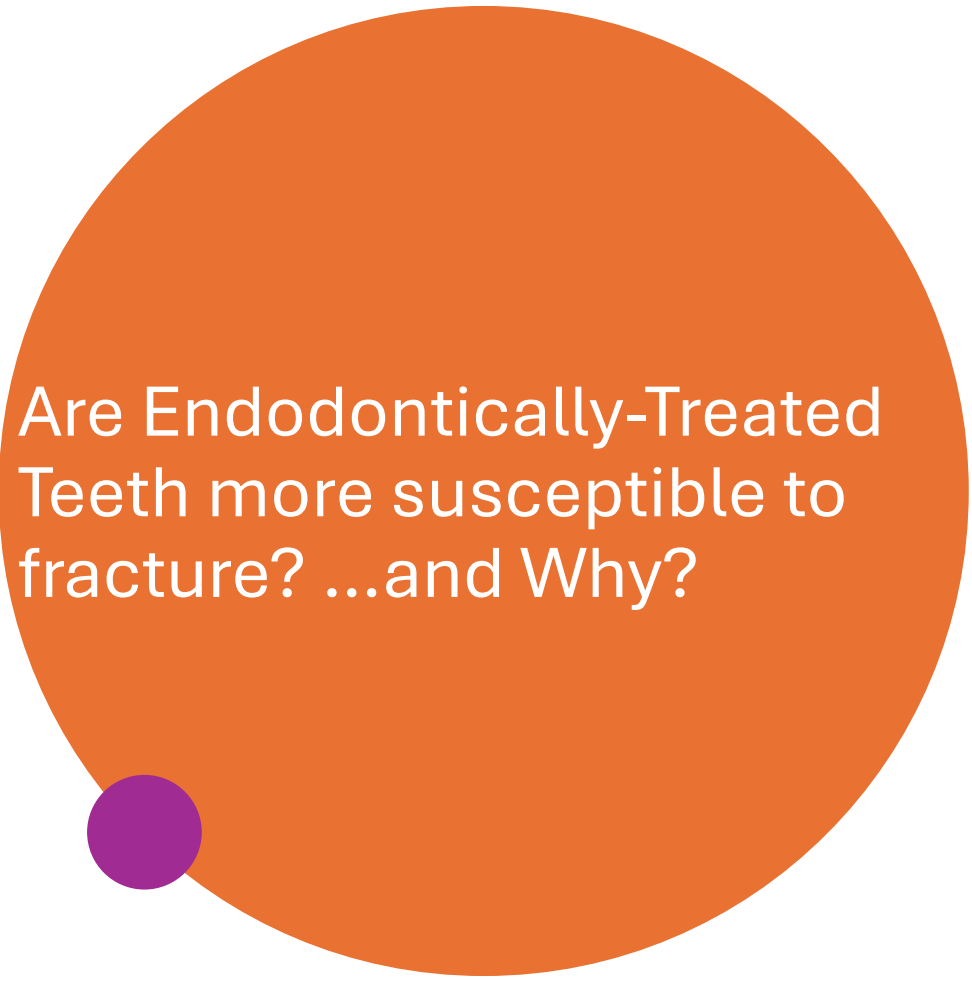




Are
Endodontically-
Treated Teeth
more susceptible
to fracture? Why?

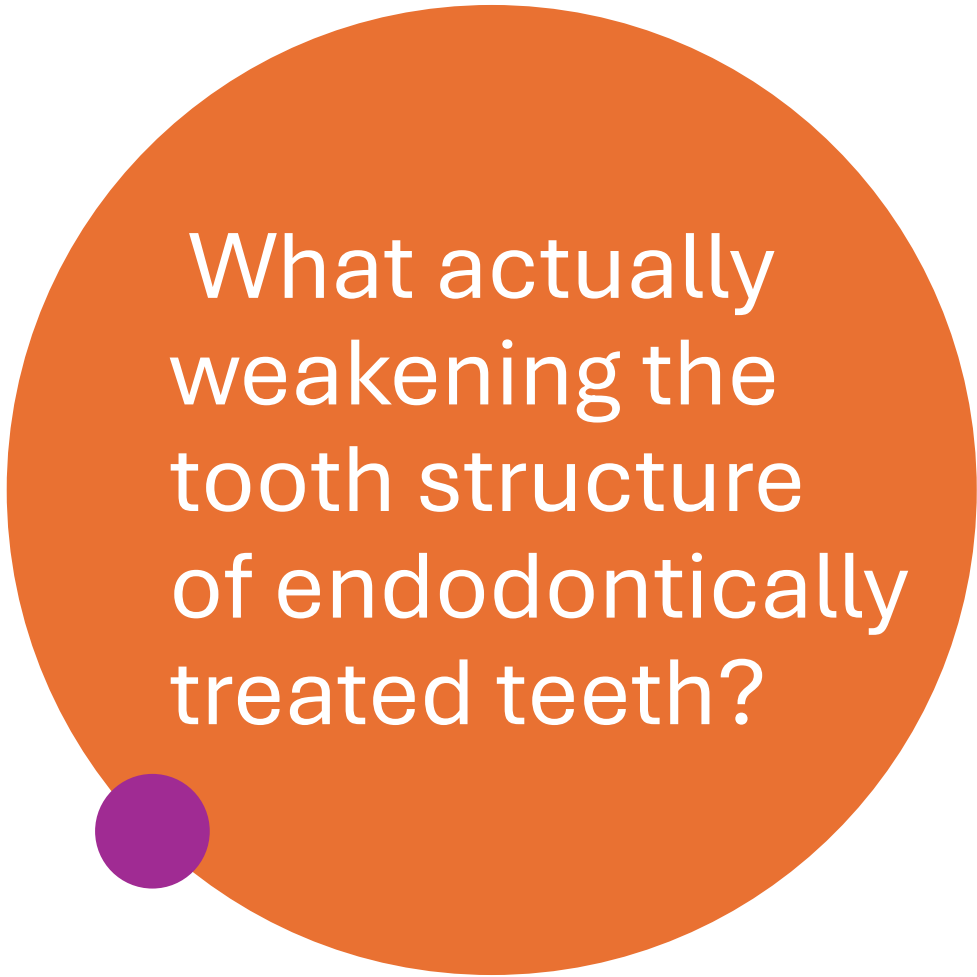
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- Common Assumption:
Dehydration of teeth after RCT due to removal of the pulp tissue leads to tooth fracture (Increase in the brittleness)

True or False?



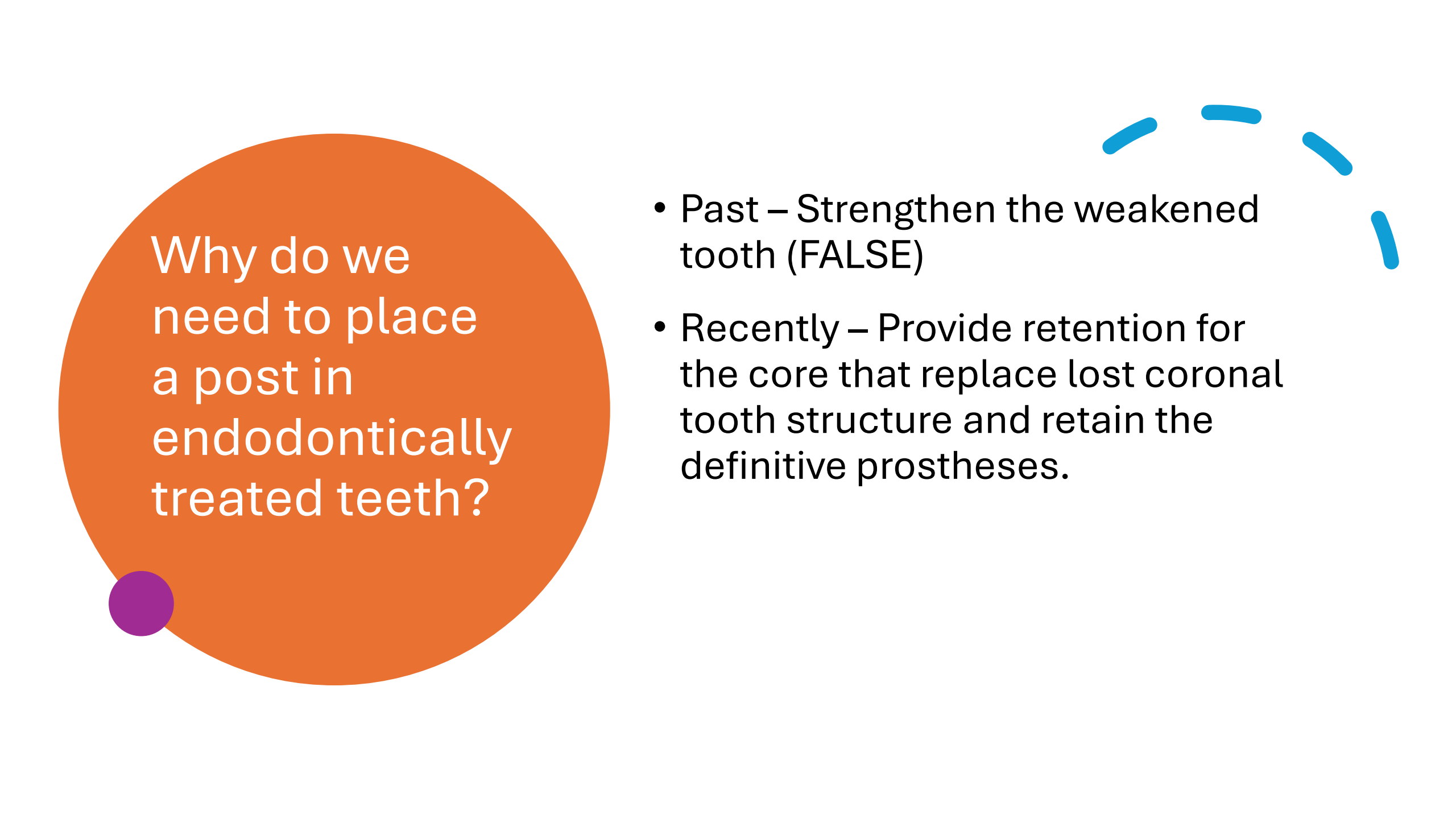
Are Endodontically-Treated Teeth more susceptible to fracture? ...and Why?

- A lot of studies have been conducted to investigate this assumption. It was found that dehydration does not appear to weaken dentin structure in terms of strength and toughness.
- In addition, it was found that root canal therapy does not significantly affect the hardness of dentin even after five to ten years




What actually weakening the tooth structure of endodontically treated teeth?

- In most endo treated teeth there are missing tooth structures caused by caries and/or existing restorations
- Endodontic access cavity and root canal preparation further lead to losing more tooth structure
- Loss of tooth structure (mainly dentin) such as cusp ridges, roof of the pulp chamber, and marginal ridges increase the risk of tooth fracture (coronal or root)



Why do we
need to place
a post in
endodontically
treated teeth?

- Past – Strengthen the weakened tooth (FALSE)
- Recently – Provide retention for the core that replace lost coronal tooth structure and retain the definitive prostheses.



When Do I need to use a post?

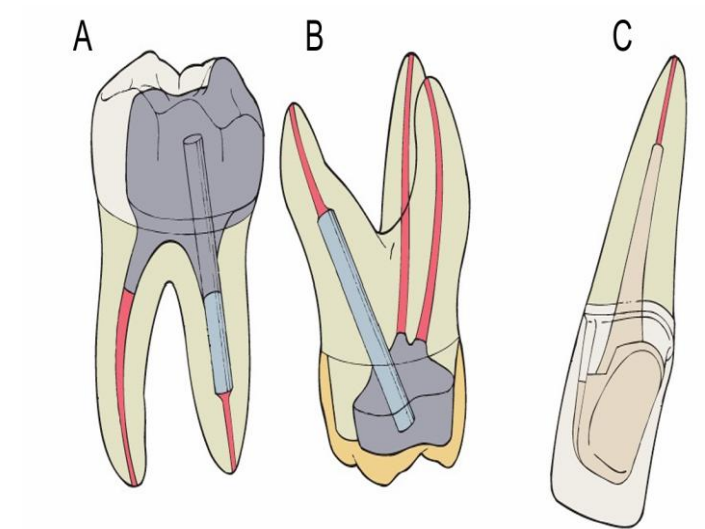
- Tooth with a lot of tooth structure: only a conservative access cavity e.g. Posterior teeth with elective endo = Post is not necessary
- Tooth with little tooth structure above the gingival margin. =Post is necessary
- Situations in between - need to assess:
 - Occlusal load
 - Tooth position
 - Type of opposing tooth
 - Function: abutment of FPD or RPD


What are the common applications of the post?

A) Post + Direct restoration (amalgam, composite) – separate

B) Post + Core (amalgam, composite) for a crown preparation – separate

C) Cast Post and Core (metal alloys such as gold) for a crown preparation – one-piece



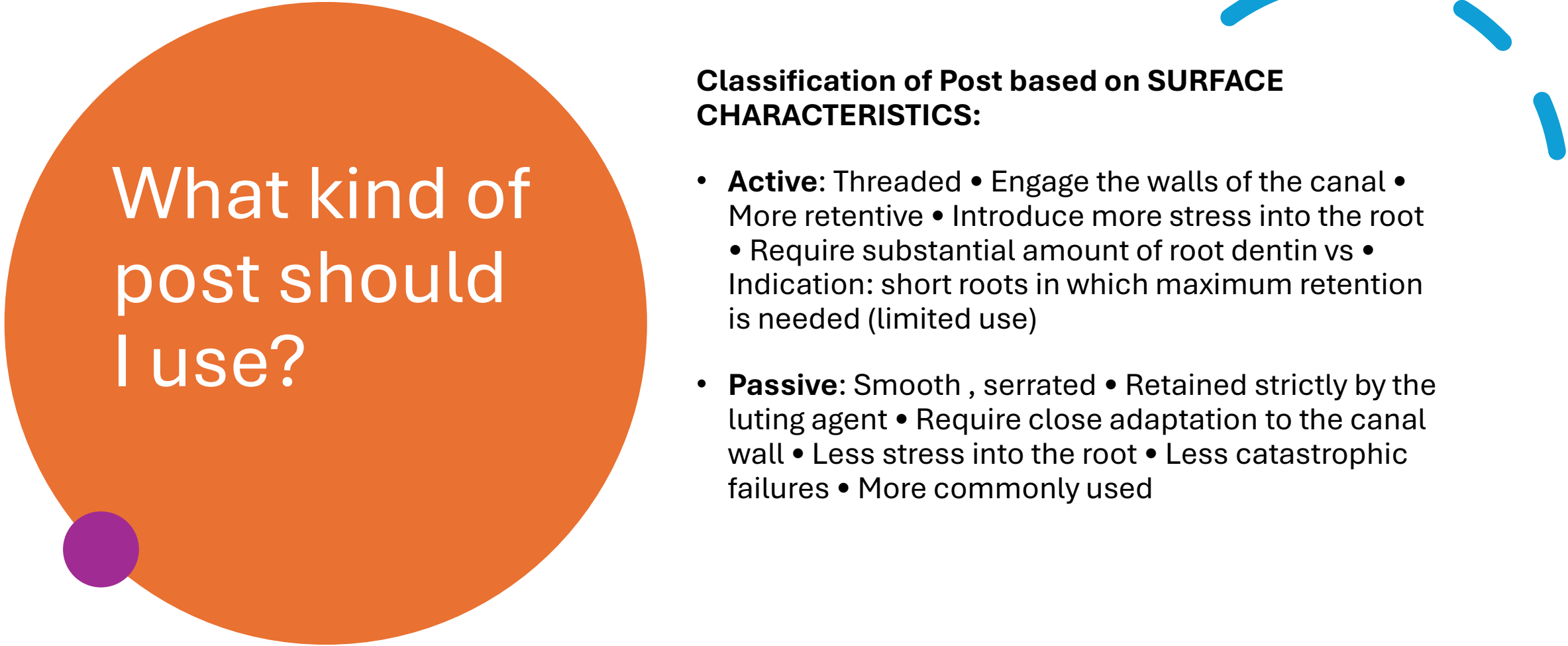


What kind of
post should
I use?



Classification of Post based on MODE OF FABRICATION


- Cast post and core: The post and the core are cast as a single unit
- Pre-Fabricated post: The pre-fabricated post is cemented in the root canal and the core is directly produced in composite or amalgam



What kind of
post should
I use?

Classification of Post based on SURFACE CHARACTERISTICS:

- **Active:** Threaded • Engage the walls of the canal • More retentive • Introduce more stress into the root • Require substantial amount of root dentin vs • Indication: short roots in which maximum retention is needed (limited use)
- **Passive:** Smooth , serrated • Retained strictly by the luting agent • Require close adaptation to the canal wall • Less stress into the root • Less catastrophic failures • More commonly used




What kind of
post should
I use?



Classification of Post based on its SHAPE:

- **parallel walls:** Increased retention • Produce uniform stress distribution along the post length • Less root fracture • Stress concentration at the apical portion
- **Tapered:** Follow natural canal form and configuration preservation of tooth structure at the post apex • Wedging effect – more stress • Stress concentration at the coronal portion of root • Lower retentive strength



What kind of post should I use?



Classification of Post based on its Material :

- Pre-fabricated: • Metal (stainless steel, titanium) • Fiber Reinforced (carbon fiber, glass fiber, quartz fiber) • Ceramic & Zirconia
- Cast: • Semi-precious alloy (gold) • Non-precious alloy (base metal) • Ceramic & zirconia



Fabrication Techniques

- **Direct** – pre-fabricated post + core (composite or amalgam)
- **Indirect** – impression technique
- **Direct-indirect** – burnout resin technique Cast post and core



POST SPACE PREPARATION

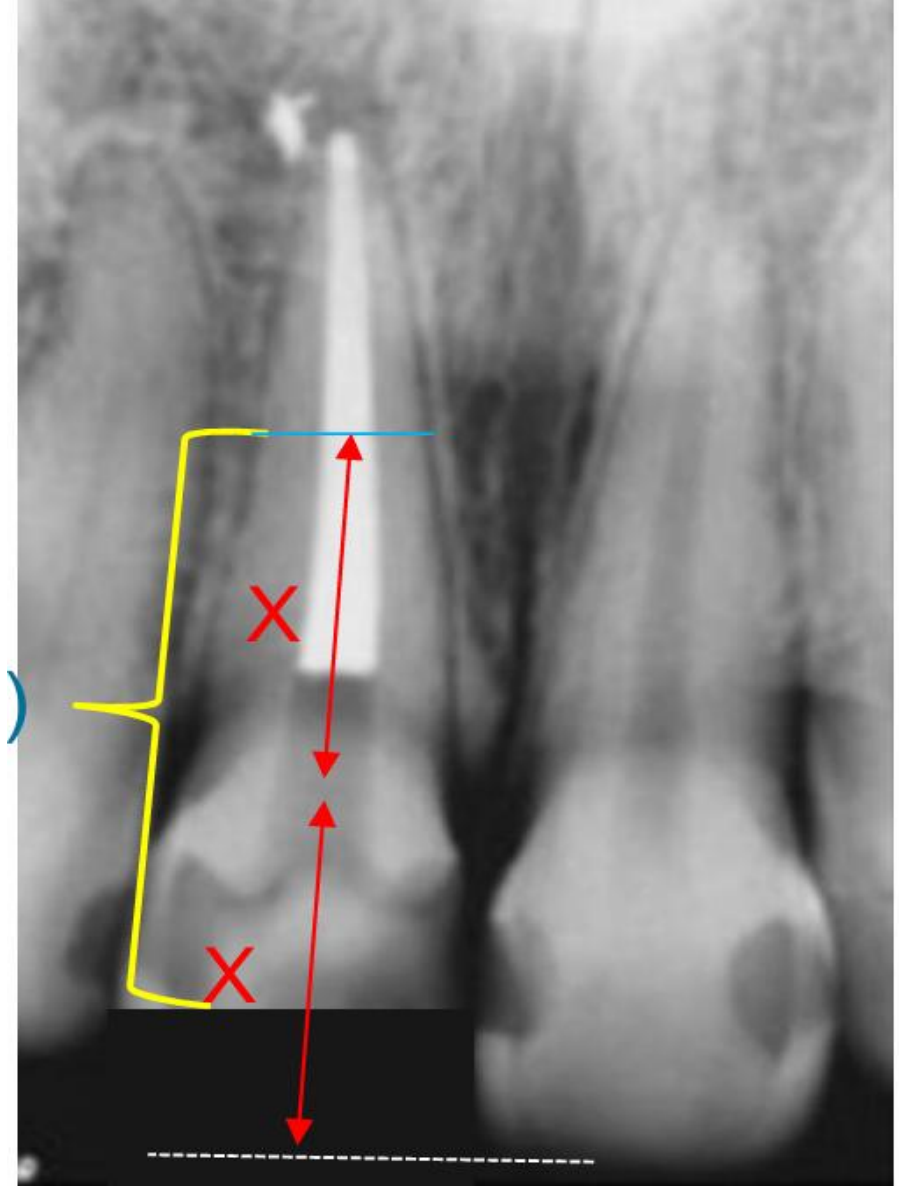
1. Determine the post length based on PA
2. Rubber Dam
3. Removal of GP
4. Post space preparation
5. Preparation of the coronal structure

1. Determine the post length based on PA

- There is no absolute guideline for the optimal post length

Post length should be:

- at least equal to the crown length
- $\frac{2}{3}$ of the remaining tooth length
- $\frac{1}{2}$ of the clinical root
- $\frac{3}{4}$ of the of the root canal length





Rubber Dam

- Avoid bacterial contamination (saliva, blood)
- Avoid inhalation of instruments (endo files, burs)
- Avoid contact of sodium hypochlorite with mucosa (we have to clean the canal at the end of the session)

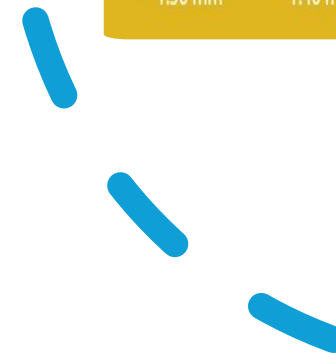
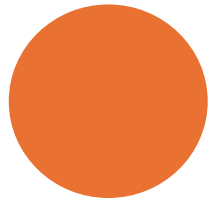
Removal of GP

- Start with a heated endodontic plugger
- Use a rubber stop to mark the WL
- Use Gate Glidden bur to reach the WL



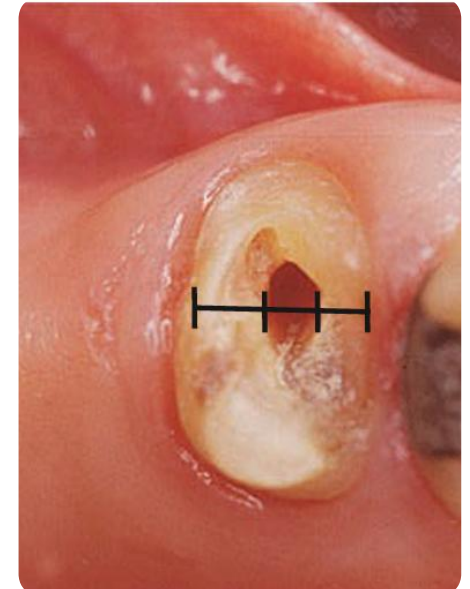
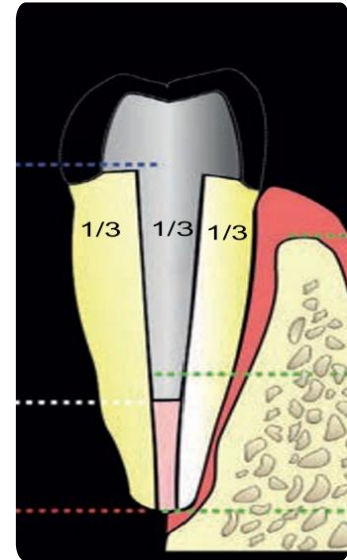
Post space preparation

- Use ParaPost drills (ParaPost System)
- Create parallel walls
- Remove undercuts inside the canal
- Establish the Width of the post:



Establish the Width of the post

- Increase post width, increase of retention and resistance
- Wide post weaken the root (removal of tooth structure)
- No more than 1/3 of the width of the root



Parapost System



ParaPost® System

A complete range of posts for direct and indirect indications

ParaPost® Fiber Posts

Taper Lux®

- › Cylindro-conical post for narrow canals where protection of sound tooth structure is absolutely key
- › 4% tapered design provides a good apical fit with greater taper file technique
- › Translucent, light-transmitting for fast on-command cementation
- › Three head design for easy post length adjustment
- › Rounded undercut head shape for optimal core retention
- › Four sizes ● ● ● ●

Fiber Lux®

- › Cylindrical post design ideal for universal post application
- › Translucent, light-transmitting for fast on-command cementation
- › Rounded, undercut double head design for optimal core retention
- › Easy post length adjustment is on head and apical end possible
- › Six sizes ● ● ● ● ● ●

Fiber White®

- › Cylindrical post design ideal for universal post application
- › Opaque fiber resin for masking discolored roots
- › Rounded, undercut double head design for optimal core retention
- › Easy post length adjustment is on head and apical end possible
- › Five sizes ● ● ● ● ●

● Ø.070" 1.75 mm ● Ø.060" 1.50 mm ● Ø.055" 1.40 mm ● Ø.050" 1.25 mm ● Ø.045" 1.14 mm ● Ø.040" 1.00 mm ● Ø.036" 0.90 mm

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ParaPost® Fiber Posts

ParaPost® Fiber Post – Clinical Application



1 Preoperative clinical situation right lateral incisor #12 after root canal treatment with provisional sealing



2 Removal of provisional sealing



3 Removing Gutta Percha



4 Extending the post preparation with a ParaPost bur



5 Trial seating of ParaPost Fiber White to check length and fit



6 Applying One Coat 7 Universal into root canal and tooth surface for 20 sec. Afterwards removal of excess bond with a gentle flow of air and a paper point



7 Freehand core build-up using ParaCore automix




8 The finished core – ready for the impression



9 Final clinical situation

ParaPost® X-System Metal Posts



The image displays three different types of ParaPost X-System Metal Posts against a light blue background. The top post is the XP™ Post, which is cylindrical with a flat head and a textured X-shaped retention pattern. The middle post is the XH™ Head, featuring a rounded, undercut double head design and a textured X-shaped retention pattern. The bottom post is the XT™ Thread, which has a threaded body with a rounded, undercut double head design and a textured X-shaped retention pattern. Each post is shown at an angle, highlighting its unique features.

XP™ Post

- › Cylindrical post with flat head is ideal for the treatment of slim or of multi-rooted teeth
- › X-Shape retention pattern including cement venting for superior mechanical grip
- › Available in Titanium alloy (Ti6AL4V) and stainless steel
- › Seven sizes ●●●●●●●, all compatible with ParaPost Drills

XH™ Head

- › Cylindrical post for easy core build-up application
- › Rounded, undercut double head design for optimal core retention
- › Flat shoulder stop provides security against over – insertion and apical stress
- › X-Shape retention pattern including cement venting for superior mechanical grip
- › Seven sizes ●●●●●●●, all compatible with ParaPost Drills

XT™ Thread

- › Threaded post with X-Shape retention pattern – cylindrical – where very high mechanical grip is required
- › Patented, low-profile threads cut through dentin with minimal insertional stress
- › Threads are located only in the coronal area where root canal walls are thicker
- › Rounded, undercut double head design for optimal core retention
- › Flat shoulder stop provides security against over – insertion and apical stress
- › Six sizes ●●●●●●, all compatible with ParaPost Drills

ParaPost® X-System Metal Posts



ParaPost® X-System – Casting Technique



XP™ Impression Post

- › Cylindrical, rigid polymer post for precise and time saving impression taking
- › Impression of entire length of post space without undercuts
- › Seven sizes (●●●●●●●), all compatible with ParaPost Drills

XP™ Burnout Post

- › Cylindrical, rigid polymer post for precise casting of a one piece cast post/core
- › Provides an X-Shape retention pattern for superior mechanical grip and cement venting
- › Easy replication of the entire length of the post space
- › Stabilizes the wax core build-up during removal
- › Individual choice of alloy
- › Seven sizes (●●●●●●●), all compatible with ParaPost Drills

XP™ Temporary Post

- › Cylindrical, plain titanium post for secure retention of temporary crown
- › Preserves the diameter of the canal preparation
- › Friction grip for snug placement, eliminating the need for temporary cement in the canal
- › Avoids time consuming removal of temporary cement from post space
- › Seven sizes (●●●●●●●), all compatible with ParaPost Drills

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