

# Bone level around endodontically treated teeth in periodontitis patients



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# Combined periapical-periodontal lesions

Several forms of combined pathology of periodontal and endodontic origin:

- severely advanced conditions
- compromising the prognosis in a dramatic way

(Bergenholtz and Hasselgren 2003, Zehnder et al 2002, Simon et al 1972)

# Influence of periapical status on periodontal disease

In periodontitis patients, presence of a periapical lesion was found to be associated with:

- a lower marginal bone level
- less response after therapy
- deeper pockets
- a higher risk for losing attachment
- higher rate of progression of disease

(Jansson et al. 1993 a, b, 1995, Ehnevid et al 1993a, b)

# Influence of periapical status on periodontal disease

Quality of endodontic treatment:  
no influence on the marginal bone support  
in patients without periodontitis

(Miyashjita et al. 1998)

# Retrospective study

Aim:

To compare the marginal bone level of teeth with root canal fillings to that of contra-lateral teeth without a root canal filling in periodontitis patients

# Methods

Of 286 patients ( $\geq 35$  years)  
referred to a practice for periodontology  
67 full sets of radiographs with:

- $\geq 1$  endodontically treated tooth
- contra-lateral tooth without a root canal treatment

# Methods

Measurement of:

- bone level on the mesial and distal aspect from the CEJ
- presence of posts
- periapical radiolucencies
- furcation involvement (in multi-rooted teeth)

# Methods

Analysis for:

- differences between treated teeth/contra-laterals

Controlled for:

- tooth surface
- presence of a post
- tooth type



# Population

- 67 sets of radiographs
- 27 males and 40 females
- age 47 years (SD 6.8, range 35 - 70)

# Population

- 70 evaluable teeth without post (48 patients)
- 38 evaluable teeth with post (30 patients)
- 11 patients, both teeth without and with posts

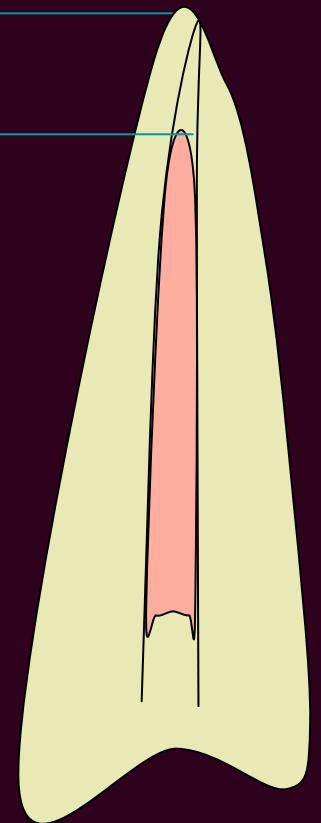
# Population

- 108 endodontically treated teeth, 175 roots
- 91 % of the cases very suggestive for gutta percha
- 7 % of roots only sealer, 2% of roots silver cone

# Endodontic characteristics

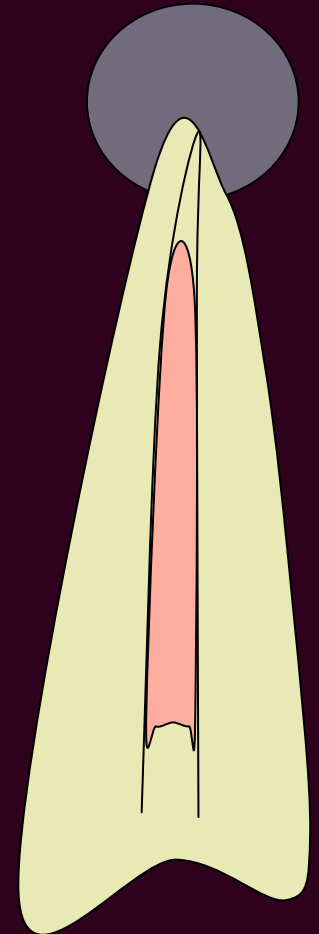
mean canal filling – apex: 2.61 mm ( $\pm$  2.31)

- in 60% canal filling - apex  $\leq$  2 mm
- 16% canal filling - apex = 3 mm
- 10% canal filling – apex between 6 and 11 mm



# Endodontic characteristics

- 14% periapical radiolucencies
- mean diameter of lesions 3.04 mm (sd 2.42)
- 11% widening of periodontal ligament
- 5% radiopaque aspect of periapical region



# Teeth without a post

| Toothtype          | n         | Bone loss Endo |            | Bone loss Contra-lateral |            |
|--------------------|-----------|----------------|------------|--------------------------|------------|
|                    |           | Mesial         | Distal     | Mesial                   | Distal     |
| I <sub>1</sub> sup | 6         | 3.2            | 3.8        | 3.0                      | 3.7        |
| I <sub>2</sub> sup | 2         | 6.0            | 6.0        | 3.5                      | 4.0        |
| Csup               | -         | -              | -          | -                        | -          |
| P <sub>1</sub> sup | 7         | 4.4            | 4.1        | 3.3                      | 3.0        |
| P <sub>2</sub> sup | 7         | 3.3            | 3.9        | 3.4                      | 4.7        |
| M <sub>1</sub> sup | 11        | 4.8            | 5.1        | 4.0                      | 3.9        |
| M <sub>2</sub> sup | 3         | 5.3            | 6.3        | 4.7                      | 4.3        |
| I <sub>1</sub> inf | -         | -              | -          | -                        | -          |
| I <sub>2</sub> inf | 1         | 4.0            | 5.0        | 4.0                      | 5.0        |
| Cinf               | 2         | 8.5            | 5.0        | 4.5                      | 5.0        |
| P <sub>1</sub> inf | 6         | 2.3            | 3.3        | 2.2                      | 2.7        |
| P <sub>2</sub> inf | 9         | 4.2            | 4.3        | 3.3                      | 3.3        |
| M <sub>1</sub> inf | 9         | 3.9            | 4.6        | 3.6                      | 4.4        |
| M <sub>2</sub> inf | 7         | 4.1            | 4.7        | 3.4                      | 4.3        |
| <b>Total</b>       | <b>70</b> | <b>4.2</b>     | <b>4.5</b> | <b>3.5</b>               | <b>3.9</b> |


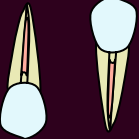


# Teeth with a post

|                    |           | Bone loss<br>Endo |            | Bone loss<br>Contra-lateral |            |
|--------------------|-----------|-------------------|------------|-----------------------------|------------|
| Toothtype          | n         | Mesial            | Distal     | Mesial                      | Distal     |
| I <sub>1</sub> sup | 2         | 3.0               | 4.0        | 3.0                         | 2.5        |
| I <sub>2</sub> sup | 3         | 4.3               | 4.0        | 3.3                         | 4.3        |
| Csup               | -         | -                 | -          | -                           | -          |
| P <sub>1</sub> sup | 6         | 4.0               | 3.6        | 3.0                         | 3.5        |
| P <sub>2</sub> sup | 8         | 4.3               | 4.1        | 3.4                         | 4.1        |
| M <sub>1</sub> sup | 5         | 3.6               | 3.8        | 3.6                         | 4.2        |
| M <sub>2</sub> sup | -         | -                 | -          | -                           | -          |
| I <sub>1</sub> inf | -         | -                 | -          | -                           | -          |
| I <sub>2</sub> inf | -         | -                 | -          | -                           | -          |
| Cinf               | -         | -                 | -          | -                           | -          |
| P <sub>1</sub> inf | 1         | 5.0               | 4.0        | 3.0                         | 4.0        |
| P <sub>2</sub> inf | 6         | 6.3               | 6.0        | 3.3                         | 4.3        |
| M <sub>1</sub> inf | 5         | 3.6               | 4.2        | 3.4                         | 4.6        |
| M <sub>2</sub> inf | 2         | 4.5               | 4.0        | 4.0                         | 3.0        |
| <b>Total</b>       | <b>38</b> | <b>4.3</b>        | <b>4.3</b> | <b>3.3</b>                  | <b>4.0</b> |

# Tooth types

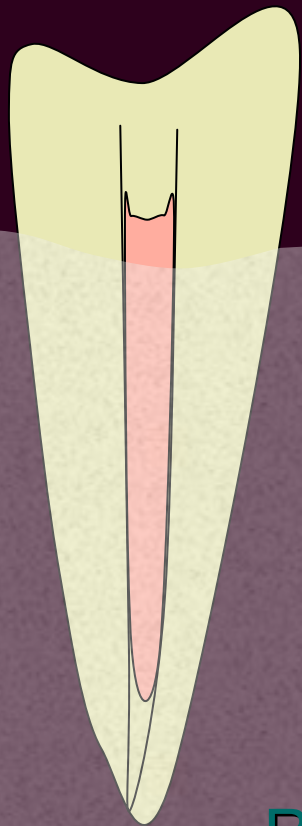
Total: 60 upper, 48 lower

Most frequent

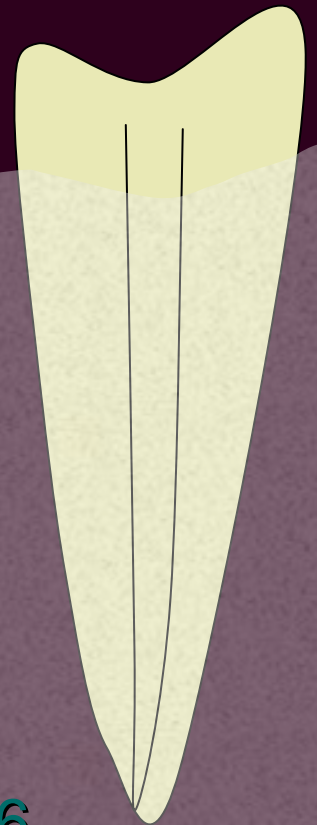
-  17 M<sub>1</sub>sup
-  15 P<sub>2</sub>sup/inf
-  14 M<sub>1</sub>inf
-  13 P<sub>1</sub>sup



# Marginal bone loss



0.7 mm more bone loss  
in endodontically treated teeth



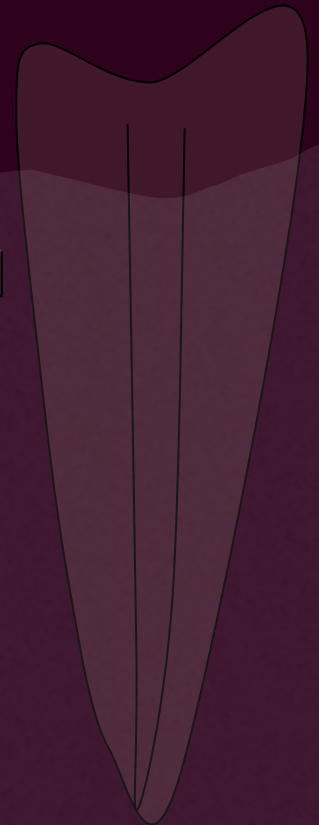
Repeated measures analysis:  $p = 0.0016$

# Marginal bone loss



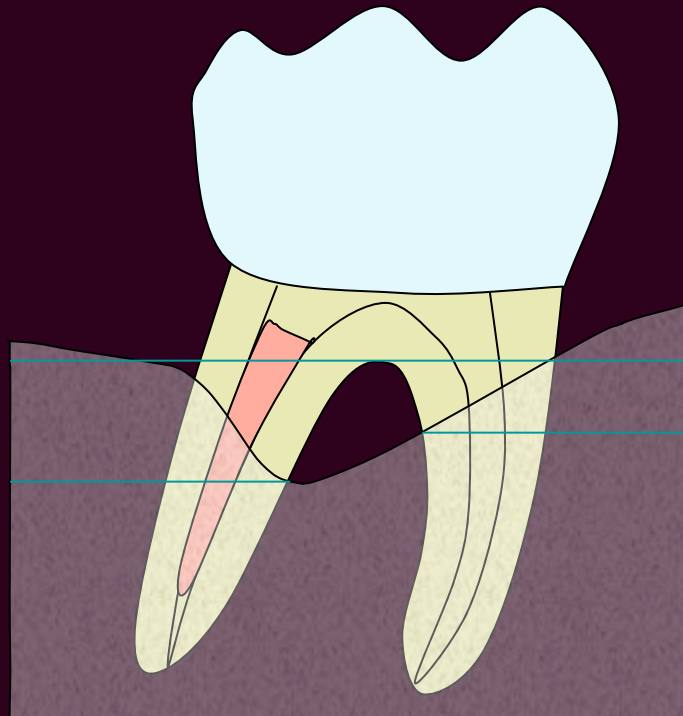
Repeated measures analysis showed no difference between:

- mesial and distal aspects
- teeth without and with posts
- different tooth types.



# Furcation involvement

endo treated tooth  
2.60 mm  $\pm$  2.11

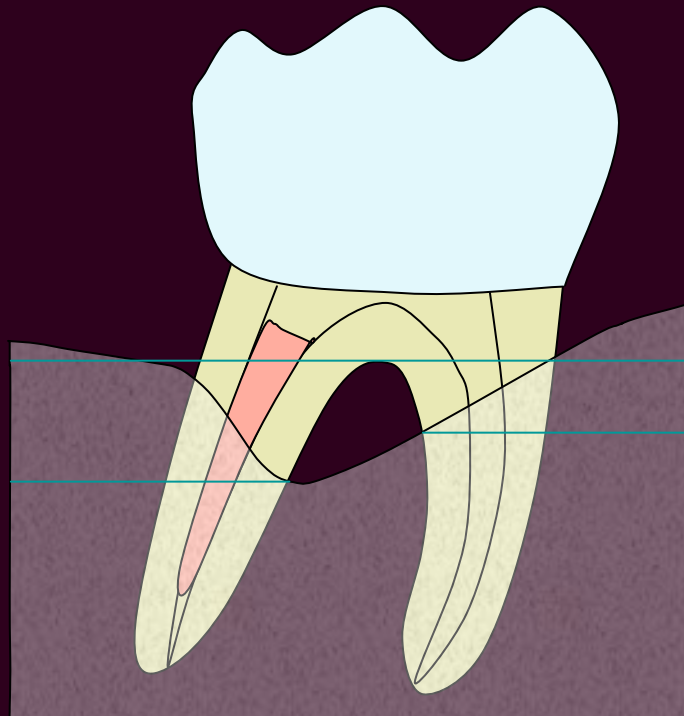


contralateral  
1.63 mm  $\pm$  1.33

not significant

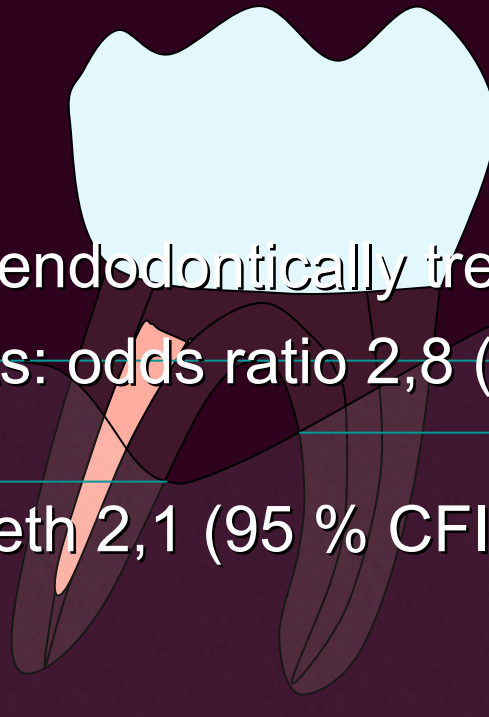
# Furcation involvement

endo treated tooth  
28 teeth involved



contralateral  
21 teeth involved

# Furcation involvement



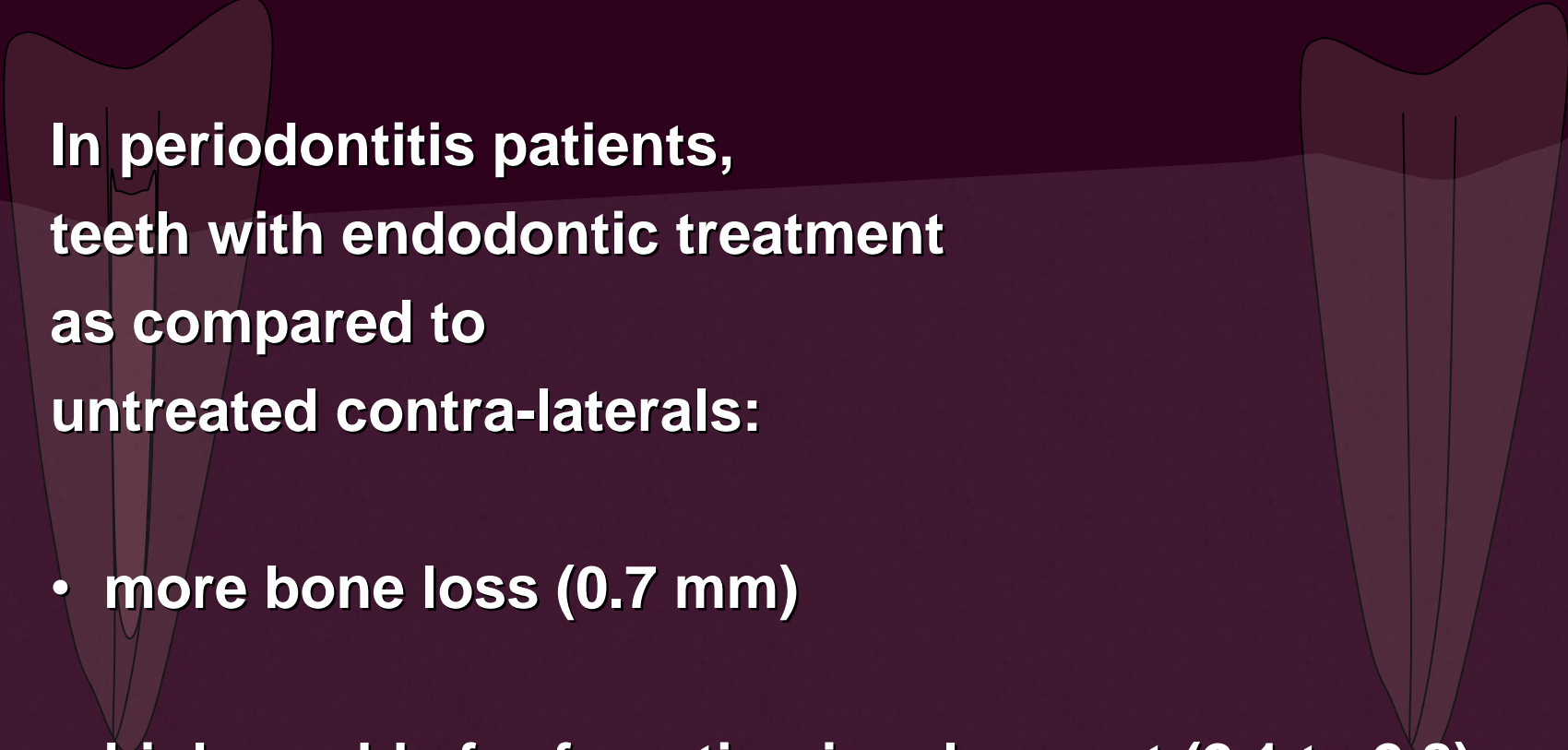
- more frequent in the endodontically treated teeth
- for teeth without posts: odds ratio 2,8 (95 % CFI 1.1 <> 7.5)

$$p_{(\text{McNemar test})} = 0.039$$

- for all multi-rooted teeth 2,1 (95 % CFI 1.0 <> 4.5)

$$p_{(\text{McNemar test})} = 0.039$$

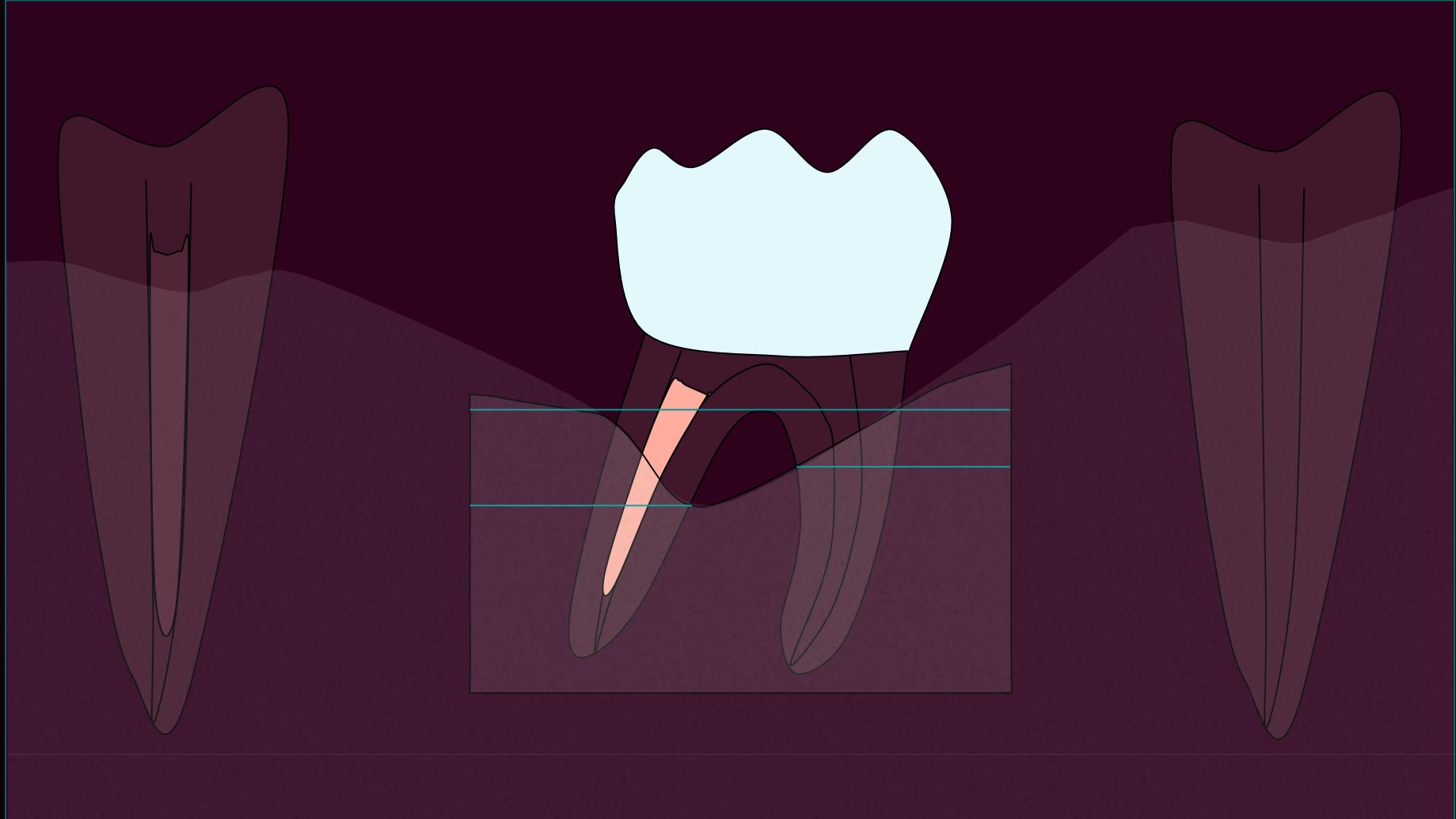
# Conclusions



**In periodontitis patients,  
teeth with endodontic treatment  
as compared to  
untreated contra-laterals:**

- **more bone loss (0.7 mm)**
- **higher odds for furcation involvement (2.1 to 2.8)**

**Thank you for your attention**





paro.praaktijk.utrecht

