

## CORRELATION OF INTERDENTAL AND INTER-RADICULAR BONE LOSS – RADIOGRAPHIC ASSESSMENT

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### BACKGROUND

Furcation areas present some of the greatest challenges to the success of periodontal therapy. Higher mortality and compromised prognosis for molars with furcal involvement have been reported in several retrospective studies of tooth loss. Additionally, reduced efficacy of periodontal therapy has been consistently found in multirooted teeth with furcation involvement, regardless of the treatment modality employed (1). It is known that with progression of periodontal destruction and the involvement of furcal areas the severity of periodontitis increases and treatment is less effective because of limited access for mechanical control. Therefore it is of great importance that chronic periodontitis treatment happens before involving the furcal areas. The threshold of alveolar bone loss associated with progression of periodontal destruction and involvement of interradicular areas is not clearly defined in the literature.

This study was undertaken to investigate the connection between interradicular bone destruction and interdental bone loss in patient with chronic periodontitis.

### OBJECTIVES

The purpose of this study is the radiographic assessment of the correlation between interdental and interradicular bone loss in mild and severe chronic periodontitis.

### METHODS

**Patients:** 49 (23 male and 26 female) 37 to 79 years of age with untreated chronic periodontitis.

**Radiographs:** Vertical and horizontal bitewing radiographs and periapical radiographs were used for measurement.

**Radiographic measurement:** All further measurements were made by a periodontal probe (Williams probe, Hu-Friedy, Chicago, IL, USA). On a total of 79 images the following distances were measured:

- CEJ-AC – cemento-enamel junction line – alveolar crest (in horizontal bone loss),
- CEJ-BD - cemento-enamel junction line – apical

extension of the bony defect (in angular bone loss),

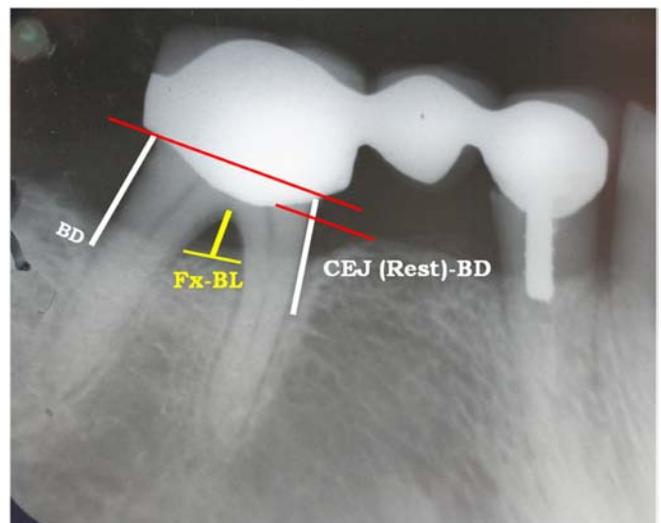
- CEJ (Rest)-AC → cemento-enamel junction (restoration) - alveolar crest – interdental bone loss/bone defect (Figure 1).

- Fx-BL → furcation fornix - bone level – the distance from the furcation fornix to the intact interradicular bone (interradicular bone loss). (4, 5).

**Definition of landmarks:** If the CEJ was destroyed by a restoration its margin was taken as reference. BD was defined as the most coronal point where the periodontal ligament space showed a continuous width. If no periodontal ligament space was identified the point where the projection of the AC crossed the root surface was taken as landmark. If both structures could be identified at one defect, the point defined by the periodontal ligament was used as BD. If several bony contours could be identified the most apical that crossed the root was defined as the BD (2, 3, 6).

**Statistical analysis:** SPSS v15.0.

**Figure 1.**



**RESULTS**

The results show that interdental and interradicular bone loss in maxillary molars with measurements for medial and distal interdental bone loss from 4.18 to 5.54 mm and above, are associated with interradicular bone loss with values of 0.45 to 1.33 mm (diagram 1).

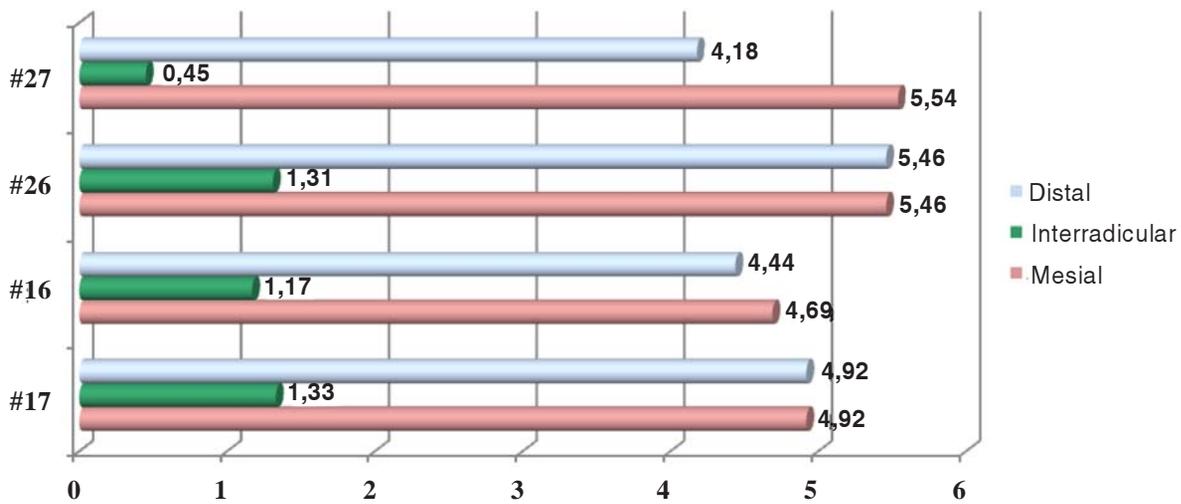
The correlation between interdental and interradicular bone loss in mandibular molars shows results of measurements of medial and distal interdental bone loss again higher than 4 mm (range 4.48 – 5.24 mm), and are

associated with interradicular bone loss with values higher than 1 mm – range 1.64 to 1.83 mm (diagram 2).

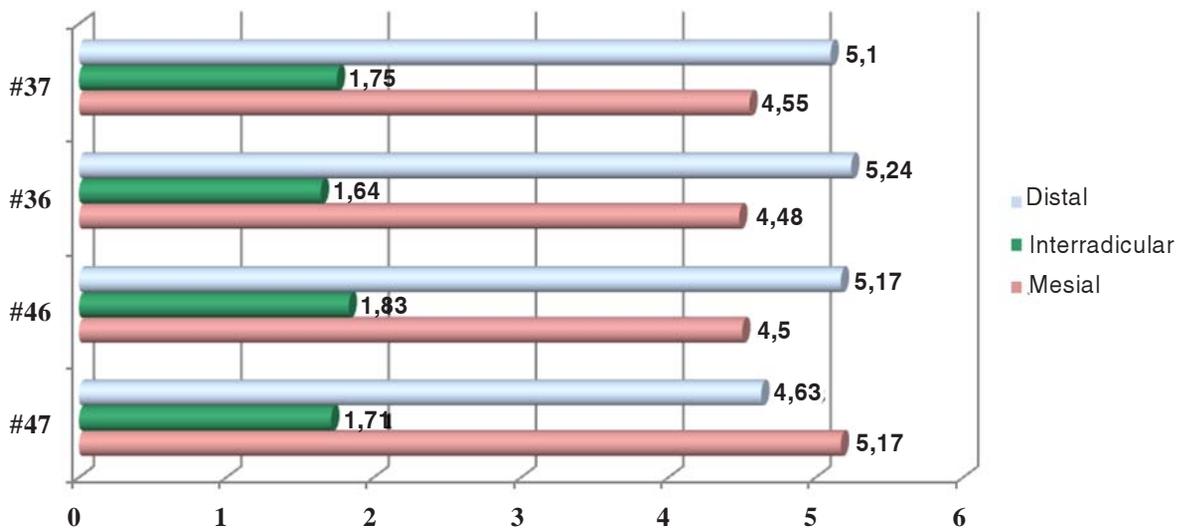
The results of this study demonstrate that the recorded mean values of interradicular bone loss in mandibular molars are higher than in maxillary molars. This is probably because of the difficulties in assessment of bone loss in the three-rooted maxillary molars on the radiographic images (diagram 3).

Furcation bone loss with ranges of 1 mm and above is in correlation to interdental bone loss of above 4 mm.

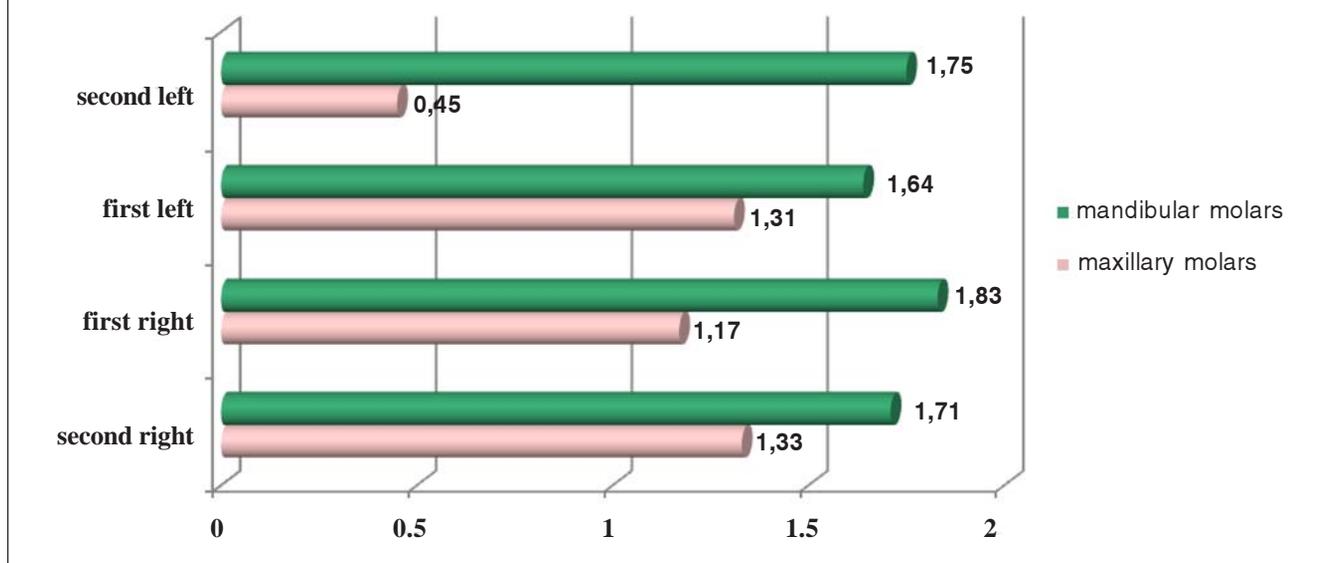
**Diagram 1. Interradicular bone loss in maxillary molars in comparison to mesial and distal bone loss in chronic periodontitis patients**



**Diagram 2. Interradicular bone loss in mandibular molars in comparison to mesial and distal bone loss in chronic periodontitis patients**



**Diagram 3. Mean values of interradicular bone loss in chronic periodontitis patients**



## CONCLUSIONS

Interradicular bone loss associated with the progression of bone destruction in multirooted teeth of patients with chronic periodontitis demonstrates some correlation to the loss of bone in the interdental area. This correlation suggests that treatment of interdental bone destruction with different modalities can prevent further

bone loss in the interdental area according to the root trunk length and furcation anatomy. Future studies with root trunk length consideration can precisely mark the limits of bone loss in chronic periodontitis when involvement of the furcation is present.

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