Incidence and treatment of furcation involvements in a Brazilian dental school. Epidemiologic data.

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Received for publication: June 26, 2003
Accepted: October 16, 2003

Abstract
The aim of the present study was to determine the incidence of these defects and the therapeutic approaches employed in 105 patients attended in a Brazilian dental school. One-hundred five periodontal charts of patients attended at the Dental Clinic of the Unicamp Dental School were examined, in order to find furcation lesions in molar and premolar teeth (upper and/or lower). The results showed that these 105 subjects exhibited 216 teeth with furcation involvements (131 at the upper jaw and 85 at the lower jaw). It represented a percentual score of furcation defects by jaw: 60.6% at the upper jaw and 39.4% at the lower jaw. The incidence of furcation lesions was higher at the first molar in all of the quadrants and the higher incidence of these defects was on the tooth #16 (34%) and the upper buccal furcation defect was the more incident in this sample (28.2%). The predominant type of furcation lesion at the upper jaw was the class I defect (61.5%) and the more prevalent defect in the lower jaw was class I (65.8%). Considering both the archs, the class I defect appeared in 60.2% of the cases, class II’s, 30.1%, and class III’s, 9.7%. The more used therapeutic approach for furcation involvements was scaling and root planing (69.9%). These data suggest that the upper teeth are more affected by furcation lesions than the lower teeth; the furcation lesions are more frequent on the first molar in all of the quadrants; the class I is the more frequent type of furcation lesion; and the more frequently used approach to treat furcation involvement was scaling and root planing.

Key Words
furcation involvement, periodontal therapy, epidemiology

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**Introduction**

Several long-term evaluations have demonstrated that the conventional periodontal therapy, i.e., scaling and root planing and/or periodontal flap surgery, if followed by a proper supportive periodontal care, results in successful management of progressive periodontal disease. However, when the molar teeth with furcation involvement were investigated specifically, the long-term response to the standard therapy differed from single-rooted teeth. These findings may be explained, among other factors, by the complex furcation morphology, and consequent limitation for accessibility to debride properly at the therapeutic phase and the difficulties to develop appropriate patient compliance to plaque control.

Accordingly with the report by Hamp et al., the furcation involvement may be treated with a large variety of clinical and surgical procedures, depending on the degree of these involvements. They have reported the results of the treatment of 175 teeth with various types of furcation involvement. Thirty-two teeth (18%) were treated only with scaling and root planing, 49 (28%) were subjected to an association between scaling and root planing and odontoplasty and/or osteoplasty. Eighty-seven teeth (50%) were treated with root resection and 7 teeth (4%) were subjected to a tunnel preparation. There was no tooth loss after a 5-years follow-up of these subjects.

There are some randomized controlled studies evaluating the efficacy of guided tissue regeneration procedures (GTR) in class II furcation defects, which were able to achieve higher attachment gain following these approaches, when it compared to scaling and root planing. However, other studies have not supported the magnitude of these results.

Lekovic et al. could not attain any furcation closure in either the membrane or the control groups. Therefore, the GTR procedure does not seem a predictable approach to class II furcation involvements.

In order to contribute for the knowledge related to the treatment of furcation lesions, the purpose of the present study is to determine the incidence of these defects and the therapeutic approaches employed in 105 patients attended in a Brazilian dental school.

**Material and Methods**

One-hundred five periodontal charts of patients attended at the Dental Clinic of the Unicamp Dental School (from 1998 to 2000) were examined, in order to find furcation lesions in molar and premolar teeth (upper and/or lower).

The furcation involvement was classified in accordance with Hamp et al.:
- Class I - Horizontal periodontal loss not exceeding 1/3 of tooth width
- Class II - Horizontal periodontal loss exceeding 1/3 of tooth width, but not totally involving the furcation area
- Class III - Horizontal periodontal loss “side-to-side” in the furcation area.

The choice of the clinical approach was based on this classification and it was the following:
- Class I - scaling and root planing
- Class II - scaling and root planing plus modified Widman flap surgery
- Class III - modified Widman flap surgery or root amputation or tunnel preparation or tooth extraction

It was examined the following issues:
- Performed therapeutic approach
- Incidence of furcation lesions by jaw (upper or lower)
- Incidence of furcation lesion by quadrant (I, II, III or IV)
- Incidence of furcation lesions by tooth
- Incidence of furcation lesions by tooth surface (buccal or lingual)
- Predominance of the different types of furcation involvements (class I, II or III)

The collected data were converted in percentages for each one of the evaluated parameters.

**Results**

The 105 periodontal charts evaluated in this study were obtained from a data bank of 739 periodontal charts, which represented 14.2% of the number of periodontal charts examined. The patients selected (54 women and 51 men) were 19 to 80 years old. The higher prevalence of furcation involvements was in patients with 40-49 years old. These 105 subjects exhibited 216 teeth with furcation involvements (131 at the upper jaw and 85 at the lower jaw). It represented a percentual score of furcation defects by jaw: 60.6% at the upper jaw and 39.4% at the lower jaw (Fig.1).

The incidence of furcation lesions was higher at the first molar in all of the quadrants. The higher incidence of these defects was on the tooth #16 (34%), followed by the #26 (25.7%), #46 (21.2%) and #36 (19.1%) (Fig.2). The distribution of furcation lesions at the second molar was the following: #17 (32.7%), #27 (27.7%), #47 (21.6%) and #37 (18%) (Fig.3).

The upper buccal furcation defect was the more incident in this sample (28.2%), with 21.8% of involvements on the lower buccal furcation, 19.9% on the distal furcation, 16.2% on the mesial furcation, and 13.9% on the lingual furcation (Fig.4). The predominant type of furcation lesion at the upper jaw was the class I defect (61.5%), followed by the class II’s (26.2%) and the class III’s (12.3%). The scores for the lower jaw were: class I defect (65.8%), class II’s (29.4%) and class III’s (4.8%). Considering both the archs, the class I defect appeared in 60.2% of the cases, class II’s, 30.1%, and class III’s, 9.7% (Table 1).

The analysis of the incidence of the different furcation lesions by quadrant had revealed that class I defect was more prevalent at the quadrant I (34.4%), followed by the quadrant II (26.4%), quadrant IV (23.3%) and quadrant III
(15.9%). The class II defects was more frequent at the quadrant II (32.2%), with 30.8% at the quadrant I, 18.5% at the quadrant III and IV, respectively. The class III defects were distributed by the following way: quadrant I (42.8%), quadrant II (33.3%), quadrant III (14.3%) and quadrant IV (9.6%).

The more used therapeutic approach for furcation involvements was scaling and root planing (69.9%), with 21.7% treated by scaling and root planing plus modified Widman flap surgery, 6% by root amputation, tooth extraction (1.8%), and tunnel preparation (0.6%) (Fig. 5).

Discussion

The aim of this study was to investigate the incidence of the different types of furcation lesions and how these defects were treated in a Brazilian dental school. The results showed that 60.6% of the furcation lesions were placed at the upper jaw and 39.4% at the lower jaw. Ross, Thompson found a distribution of 3:1 for the furcation lesions by the upper and lower jaw.

Larato concluded that the incidence of furcation lesions decreases with the more posterior tooth location in the upper arch, but in the lower arch, the incidence of furcation lesions was more frequent on first, third and second molars in a decreasing order. In addition, the author above found that the first molar was the more affected tooth by the furcation involvements. The results of this study also found a decrease of the incidence of furcation lesions with the more posterior location in the upper arch, and the first molar was also more frequently detected with furcation involvements. On the other hand, the incidence of the furcation defects in the lower arch followed the same standard for the upper arch in our sample. However, there are some differences among the examined sample by Larato and the periodontal charts collected to our study, since that Larato’s findings are related to an observation of skulls, which allowed a better diagnosis. The same observation could not be performed in the patients. This issue may explain the difference among the sample sizes.

One hundred eighty eight (188) human skulls presented some type of furcation involvement, in a total number of 305 skulls.
This is corresponding to 61.6% of the examined skulls. In our study, 739 periodontal charts were examined and only 14.2% (105) presented any furcation defect.

In the present study, 70% of the teeth with furcation lesions were treated by scaling and root planing. Hamp et al.6 founded that 50% of the teeth with furcation defects were treated with root resection, and only 18% were treated by scaling and root planing. This divergence may be explained by a higher prevalence of class II furcation defects in the sample of Hamp et al.6, which were not corresponding to the present findings (60.2% of class I furcation lesions). It would be necessary to confirm the long-term effectiveness of these different therapeutic approaches, since that Hamp et al.6 evaluated their patients by a 5-year period and they found satisfactory results after this period.

Thus, within the limits of the present data, it is possible to conclude that:

- The furcation lesions are more incident in patients with 40-49 years old;
- The upper teeth are more affected by furcation lesions than the lower teeth;
- The furcation lesions are more frequent on the first molar in all of the quadrants;
- The class I is the more frequent type of furcation lesion;
- The more used approach to treat furcation involvement was scaling and root planing.

References