Effect of Retention of Gingival Sulcular Epithelium on Attachment and Pocket Depth after Periodontal Surgery*

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Both the modified Widman flap and the intrasulcular incision technique produced significant and similar reductions in pocket depth and increases in attachment. Loss of attachment occurred where the initial pocket depth was less than 3 mm. Both techniques resulted in significant and similar increases in gingival recession. Neither technique affected tooth mobility or plaque scores to a clinically important degree. Historically, the necessity for removal of the sulcular epithelium in the course of periodontal therapy is a widely accepted tenet. This study fails to clinically validate this concept.

Removal of the gingival sulcular epithelium has been considered an essential part of pocket reduction therapy.1 The periodontal pocket was considered an infected wound, and the same principles used in conservative general surgery were thought to apply to the treatment of periodontal disease. Surgical 'freshening' of the infected tissues consisted of removing the outer layer of exposed cementum and the sulcular epithelium.1-3 The intention was to minimize the length of the epithelial attachment and to increase the connective tissue attachment. The epithelial attachment was considered to be weak and it was suggested that a shallow sulcus could become a deep pocket in a matter of hours.6 The treatment recommended for removal of the gingival sulcular epithelium included curettage,1,7,8 chemical cautery,9,10 surgical curettage,11,12 the inverse beveled full-thickness flap,13-16 and the excisional new attachment procedure (ENAP).17 However, other modalities that did not include removal of sulcular epithelium did result in similar posttreatment attachment.18-20

Several histologic studies21-32 examined postoperative qualitative differences in the dentogingival junction wherein the gingival sulcular epithelium was removed or retained. Regardless of the technique, healing occurred via the formation of a long junctional epithelium with minimal change in the amount of connective tissue attachment.

The purpose of the study described here was to determine whether any quantitative differences in pocket depth, attachment level or recession resulted from the utilization of surgical techniques that either retained or removed the gingival sulcular epithelium.

MATERIALS AND METHODS

Description of Sample. The experimental sample consisted of five men and seven women, 34 to 60 years in age (mean age, 44 years). Three pairs of teeth were studied in each patient. The experimental group of teeth included the central incisor, lateral incisor and cuspid on one side of the midline of either the maxillary or mandibular arch; the control group included the contralateral corresponding teeth. The groups of three teeth were assigned randomly as either control or experimental (Table 1).

Experimental Design. The initial examination included a review of past medical and dental histories, a full mouth intraoral radiographic survey, oral hard and soft tissue examination and complete periodontal evaluation. The periodontal evaluation included charting of missing teeth, tooth migration, tooth mobility, tooth vitality where indicated, periodontal pocket depth and the presence of any mucogingival defects. Preliminary treatment included scaling, root planing, oral hygiene instructions, occlusal adjustment where indicated and correction of any potential etiologic factors such as active dental caries or defective dental restorations. Upon completion of preliminary therapy, patients were reevaluated. Patients exhibiting bilateral, symmetric pocket depth and attachment loss in the anterior maxilla or mandible were selected for the study. Patients with systemic disease or those receiving systemic medications that might alter the response to periodontal therapy were excluded from the study.

Treatment Techniques. Control. The modified Wid-
man flap technique (MWF) as described by Ramfjord and Nissle was used in treating the teeth comprising the control group.

**Experimental.** The intention in treating the teeth comprising the experimental group was to retain the sulcular epithelium. An intrasulcular incision technique (ISI) was used. A single scalloped incision was extended as far interproximally as possible and directed from the base of the gingival crevice to the alveolar crest, thus producing a full-thickness primary flap and retaining the epithelialized pocket lining.

In both groups, root surfaces were thoroughly planed. Flaps were apposed and secured with interrupted 3-0 silk suture, and a periodontal dressing was applied. One week postoperatively, the dressing and sutures were removed and patients were instructed in oral hygiene procedures. Approximately 1 month postoperatively, the patients were seen and oral hygiene instructions were repeated if indicated.

**Measurement Stents.** Upon completion of the hygienic phase of treatment and prior to surgery, acrylic stents were vacuum-adapted to study casts. The stents, which extended from the first bicuspid through the contralateral first bicuspid, were trimmed to approximately 2 mm from the coronal margin of the gingiva and were designed to snap over the height of contour of the crowns of the teeth. A No. 556 fissure bur was used to groove the stent in an occlusal-apical direction at six points corresponding to the midfacial and midlingual and the mesiofacial, mesiolingual, distofacial and distolingual line angles of each tooth. The grooves provided reproducible alignment of a periodontal probe at the six locations on each tooth throughout the study. (This is a modification of the technique described by Froum et al.)

Calibrated periodontal probes were used throughout the study.

**Examiner Calibration.** All clinical scoring was performed by one examiner. To test the intra-examiner variation, the distance from the stent to the pocket base was measured at six points on each of six teeth of one subject on 3 consecutive days. Eighteen of 36 (50%) of the measurements were identical on all 3 days and 17 of 36 (47%) were the same on 2 of the 3 days. The low scorer error and high degree of reproducibility were similar to those reported by others and therefore were considered to be acceptable.

**Clinical Measurements.** Clinical measurements were obtained after the hygienic phase of treatment but prior to surgical therapy and again at 3 and 6 months postoperatively. These included: (1) nonstandardized introral Kodachrome transparencies, (2) tooth mobility, (3) gingival index, (4) plaque index, (5) six measurements around each tooth from the stent to the gingival margin and (6) six measurements around each tooth from the stent to the base of the pocket.

**Statistical Methods.** For each end-point in each subject, means of the measurements were calculated for the initial, 3-month and 6-month examinations. All statistical conclusions are based upon the analysis of these means. Paired t tests with 11 degrees of freedom were performed for comparison and treatment. With the exception of mobility and plaque index, treatment differences did not depart significantly from the Gaussian distribution assumed for the paired t tests.

**RESULTS**

**Pocket Depth.** At 3 and 6 months, pocket depths were significantly ($P < 0.001$) less than the initial depth, but there was no significant difference between treatments ($P > 0.10$) (Fig. 1A).

**Attachment Level.** At both 3 and 6 months, attachment gain was significantly greater ($P < 0.01$) than 0, but there was no significant difference between treat-
ments (Fig. 1B). Attachment level increased with increasing pocket depth for both treatments. Attachment was lost for pockets with an initial depth of less than 4 mm.

Gingival Margin Location. The differences between baseline MWF and ISI values were not significant (P > 0.10). Both treatments resulted in a significant increase in gingival recession. At 3 months there was a suggestion of increased recession on the MWF side. However, at 6 months the difference between treatments was negligible.

Contribution of Attachment Level and Recession to Change in Pocket Depth. An identical pocket reduction of 46% (pockets greater than 4 mm) was obtained at 6 months in both groups (MWF and ISI). With the MWF, 5% was due to the increase in attachment and 65% was due to gingival recession. With the ISI, 38% was due to increase in attachment and 62% was due to gingival recession.

Mobility. There was no significant difference in mobility initially or at 6 months.

Plaque Index. The ISI had a slightly higher baseline value than the MWF. A reduction of 0.36 for the ISI and 0.08 for MWF (P = 0.02) was noted at 6 months.

Gingival Index. The gingival index was initially significantly higher for the MWF side. There were no significant differences between treatments at 6 months.

DISCUSSION

The distribution of periodontal pocket depth was similar for the experimental and control teeth; 70% of the initial pockets were greater than 3 mm in depth.

The pocket reduction and the attachment level change obtained in the study by use of the MWF are comparable to those reported by others using this same technique. The recession noted in the present study is similar to that reported by Froum et al. at 6 months after use of the MWF technique. In the present study, mobility increased slightly at 3 months but had decreased to near baseline by 6 months where the MWF was used. An increase followed by a gradual decrease over a period of 6 months was reported by Smith et al. Plaque scores for the MWF side were lower than the median plaque score found in the 8-year Michigan longitudinal study and the scores reported by Pihlstrom et al. Variations in the plaque scores did occur from baseline to the end of the study. Although small, these differences were statistically significant. This finding is consistent with previous work.

In the present study there was a 51% improvement in the gingival index at 6 months after treatment with the MWF. This percentage of improvement is consistent with that reported by Zanett and higher than that reported by Smith et al.

It could be seen that our results with the MWF are similar to those reported by others in all measured parameters. In this study, in comparing the MWF and the ISI, no significant quantitative differences in pocket depth, attachment level, recession, mobility, plaque accumulation or gingival inflammation were found at 6 months postoperatively.

Conclusion. The removal of sulcular epithelium in the course of periodontal surgery provided no therapeutic advantage.

REFERENCES


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**Announcement**

**ORAL HEALTH RESEARCH CENTER**

On November 15 and 16, 1984, the Oral Health Research Center at Fairleigh Dickinson University will sponsor a limited attendance symposium entitled "New Approaches to the Diagnosis and Chemotherapeutic Management of the Periodontal Disease." The symposium is supported by Fairleigh Dickinson University School of Dentistry, Block Drug Company, Inc., Johnson & Johnson Products, Inc., Lever Research, Inc. and Warner-Lambert Company. The purpose of the symposium is to bring together active research scientists in the fields of microbiology, immunology, pharmacology and clinical periodontology to discuss the state-of-the-art in: 1) diagnostic techniques, such as clinical parameters, radiography and evaluation of gingival crevicular fluid; and 2) chemotherapeutic approaches to the treatment of the periodontal diseases.

For additional details concerning the meeting contact: Dr. Anthony Piecok, Director, Oral Health Research Center, School of Dentistry, Fairleigh Dickinson University, 110 Fuller Place, Hackensack, NJ 07601- Telephone: (201) 692-2622.