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ATTACHMENT LEVELS AND CREVICULAR DEPTHS AT THE DISTAL OF MANDIB--ETC(U)
FEB 81 W H OSBORNE, A J SNYDER, T R TEMPEL

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The effect of root planing and curettage on the crevicular depth and periodontal attachment at the distal of mandibular second molars following removal of adjacent impacted or partially erupted third molars was evaluated in eighteen patients between the ages of eighteen and twenty-five presenting with bilateral similar impactions. No significant difference was demonstrated in the crevicular depths and attachment levels between the curetted, root planed side and the untreated controls. Thus, any benefits derived by root planing and

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curettage of mandibular second molars immediately following removal of adjacent impacted third molars are minimal. The best means of preserving periodontal attachment on mandibular second molars may be the removal of third molars at an early stage of tooth development.

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ATTACHMENT LEVELS AND CREVICULAR DEPTHS AT THE
DISTAL OF MANDIBULAR SECOND MOLARS FOLLOWING
REMOVAL OF ADJACENT THIRD MOLARS

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Periodontal pocket formation on the distal of mandibular second molars following removal of partially erupted or impacted third molars has been reported as a problem in dental practice.^{1, 2} However, there is a scarcity of literature concerning surgical techniques which might aid in the preservation of periodontal attachment following removal of third molars.

Grooves and Moore evaluated the influence of flap design on the periodontal condition of mandibular second molars after impacted third molars were removed.³ They found two factors which influence the amount of pocketing at the distal of lower second molars. The first was the presence or absence of attached masticatory gingiva surrounding the second molars; the second was the presence of an impacted third molar disrupting the epithelial attachment distal to the second molar. They stated that removal of impacted third molars did not necessarily increase pocket formation, especially if the third molar was partially erupted. Proper flap design was a very important factor which influenced the eventual periodontal state of mandibular second molars.³

Szmyd and Hester investigated the effect of impacted third molar surgery on the crevicular depth of adjacent second molars.⁴ Their attempts to measure attachment by determining the distance between the bottom of the crevice and the cemento-enamel junction prior to surgery were unsuccessful, but they were able to measure crevicular depth. Their findings suggest that crevicular depth around second molars is reduced by the removal of the adjacent impacted mandibular third molars.⁴

Grondahl and Lekholm studied the supporting tissues at the distal of mandibular second molars in patients with impacted and partially erupted third molars.⁵ They evaluated supporting bone, plaque, gingival inflammation, and depth of gingival pockets. When the impacted or partially erupted third molars were removed, a careful "toilette" of the socket was carried out with extirpation of follicular remnants and pocket epithelium, as well as curettage of exposed parts of the distal root of the second molars. Twelve months after surgery no change was found in the supporting bone, but improvements were noted in amounts of plaque, gingival inflammation, and pocket depth.⁵

Ash, Costich, and Hayward studied the effect of extraction of third molars on the periodontal tissues distal to second molars and means of minimizing periodontal complications following surgery.¹ Criteria for evaluation of the periodontal structures were based on gingival inflammation, depth of gingival crevice, and height of alveolar crest. They found that removal of partially erupted or completely impacted third molars resulted in high incidence of periodontal pocket formation on the distal of second molars. They also stated that extraction of third molars early in their development was the only method for preventing loss of periodontal support on the distal of second molars. These authors concluded that all impacted or potentially impacted third molars should be removed as early in their development as possible to minimize loss of supporting structures; however, the removal of extremely deep impactions should be avoided except in young patients.¹

Many authors have studied crevicular depth following removal of third molars, but few have attempted to measure post-surgical periodontal attachment. Additionally, there are few reports of surgical procedures that minimize loss or enhance attachment on the distal of second molars following removal of third molars. If it is possible to obtain a more predictable level of attachment by performing specific procedures such as root planing and curettage following removal of impacted third molars, then one might argue against early removal of third molars. On the other hand, advocates of early removal of third molars would have a more convincing argument if loss of attachment at the distal of second molars occurred predictably as a result of removal of adjacent impacted third molars.

The purpose of this study was to determine if definitive root planing and curettage would influence the periodontal attachment and crevicular depth on the distal of second molars following removal of impacted and partially erupted third molars.

MATERIALS AND METHODS

Eighteen patients between eighteen and twenty-five years of age with bilateral similar impactions served as subjects. They received detailed periodontal examinations and were appointed for removal of third molars. None of these patients had systemic medical problems. Third molars, for the purpose of this study, were classified with the use of roentgenographic and clinical evaluation into the following groups:

Group 1 - Bony impaction, i.e., the tooth was completely surrounded by bone.

Group 2 - Soft tissue impaction, i.e., the occlusal surface of the tooth was completely covered by soft tissue but not bone.

Group 3 - Partially erupted, i.e., the occlusal surface of the tooth was clinically evident.

The depth of the gingival crevice at the distal of the right and left mandibular second molars was measured by the same dentist with a periodontal probe at the distolingual and distobuccal line angles and the mid-distal area (Fig. 1). In a similar manner, attachment levels were determined by measuring from the tips of the distolingual and distobuccal cusps and the midpoint of the distal marginal ridge (the cemento-enamel junction could not be identified in most cases) to the depth of the crevice (Fig. 2). Gingival inflammation was assessed according to the Gingival Index of Løe and Silness,⁶ and to the Plaque Index of Silness and Løe.⁷

Alginate impressions were taken and periodontal diagnostic study casts made. Clinical photographs and periapical radiographs were also taken. Personalized long cone radiographic film holders were constructed with acrylic bite registrations to assure standard film placement.⁸ Grids were placed over the radiographic films for assessment of postoperative osseous changes.

Following removal of the left mandibular third molar (T#17), the soft tissue remnants of the socket (granulation tissue and tooth follicle) and the tissue at the distal of the mandibular second molar (T#18) were curetted and the distal root was planed. This side was referred to as the experimental side. On the right or control side, neither curettage nor root planing was performed

at the distal of the right mandibular second molar (T#31) following removal of the third molar (T#32).

Measurements, indices, impressions, radiographs, and clinical photos were repeated at 3-month and 1-year post-third molar removal appointments for comparisons.

RESULTS

Statistical analysis using the 1-way analysis of variance⁹ demonstrated no significant change in:

1. Crevicular depth on either side, i.e., from the initial depth and the depth measured at 3-month and 1-year post-extraction appointments (see Table 1).
2. Attachment levels on either side, i.e., from the levels measured before surgery to the levels measured at 3-month and 1-year post-surgery (see Table 2). (Although a change was noted in the controls, this change was not statistically significant.)

In addition, no significant differences in the Gingival Index or the Plaque Index were noted in either group (see Tables 3 and 4).

DISCUSSION

Clinical studies have shown that third molar extractions may result in periodontal destruction at the distal of remaining second molars. Conversely, it appears that retention of partially erupted third molars or closely approximated third molars may also allow periodontal destruction to proceed at a more rapid rate. The results of this study support the findings of Ash et al., that root planing of adjacent second molars seems to be of minimal value in significantly

reducing crevicular depth or inducing reattachment at or near original levels. The fact that attachment was lost, in spite of definitive root planing of the second molar, leads the investigators to believe second molar root planing at the time of partially erupted or impacted third molar removal may be of little or no benefit to the patient.

The results of this study concerning crevicular depths pre- and post-surgery show a slight, but not statistically significant, increase in crevicular depth following third molar removal regardless of second molar root preparation. This is in agreement with Ash et al. but in disagreement with Szmyd and Hester, and Grooves and Moore. The important post-surgical situation is not merely crevicular depth but at what level reattachment occurs on the distal of mandibular second molars following third molar removal. A 2 mm sulcus is of little benefit if the patient loses 50% of the attachment and has large areas of exposed sensitive cementum.

CONCLUSION

Throughout the years, the controversy concerning the benefits of early removal of third molars has been, and continues to be, inconclusive as was vividly demonstrated at the recent NIH Symposium on Third Molars.¹⁰ Prior to the present study, it was felt that the periodontal attachment on the distal root of mandibular second molars would be enhanced if its distal root were root planed and the adjacent soft tissue curetted immediately following removal of an adjacent impacted third molar. However, statistical evidence and the clinical and radiographic results of this study demonstrate that any benefits derived following completion of such procedures is

negligible. It is concluded that removal of mandibular third molars in their early stages of development is the best means of preventing or minimizing loss of attachment on mandibular second molars.

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"The opinions expressed herein are those of the authors and are not to be construed as those of the Army Medical Department."

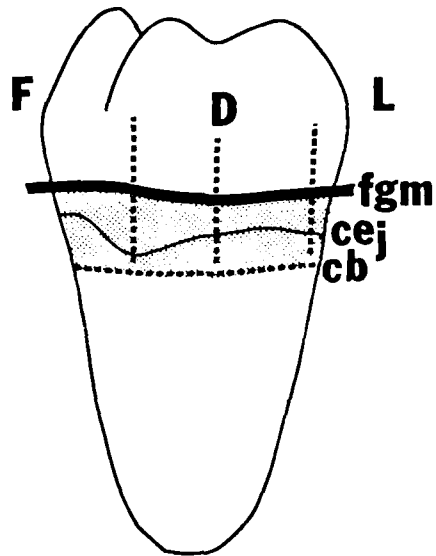


Figure 1. Crevicular depth measured with a periodontal probe from the free gingival margin(fgm) to the crevice base(cb). Measurements were made at the disto-facial lineangle, mid-distal, and disto-lingual lineangle.

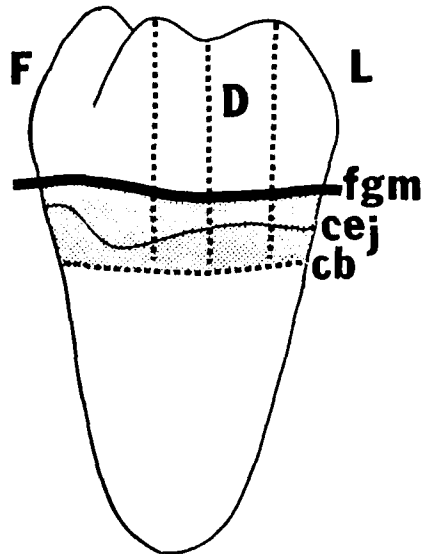


Figure 2. Attachment level measured with a periodontal probe from the disto-facial cusp tip, the midpoint of the distal marginal ridge, and the disto-lingual cusp tip to the crevice base. The cemento-enamel junction, usually used as a reference point for determining attachment level, could not be visualized on the distal of the mandibular second molar.

TABLE 1
CREVICULAR DEPTH

TIME	Depth in mm (a)	
	CONTROL	EXPERIMENTAL
PRE-OP	3.4±0.1	3.1±0.2
3-MONTH	3.3±0.2	3.2±0.2
1-YEAR	3.6±0.2	3.4±0.1

(a) Mean Std error of the mean of fifteen teeth.
Each observation is the average of three measurements made around each tooth.

TABLE 2

ATTACHMENT LEVELS

	Level in mm (a)	
TIME	CONTROL	EXPERIMENTAL
PRE-OP	4.9±0.2	4.8±0.2
3-MONTH	6.3±0.2	6.0±0.2
1-YEAR	5.5±0.3	4.8±0.3

(a) Mean Std error of the mean of fifteen teeth.
Each observation is the average of three measurements made around each tooth.

TABLE 3
GINGIVAL INDEX

TIME	CONTROL	EXPERIMENTAL
PRE-OP	0.4±0.1	0.5±0.1
1-YEAR	0.8±0.1	0.7±0.1

TABLE 4
PLAQUE INDEX

TIME	CONTROL	EXPERIMENTAL
PRE-OP	0.7±0.1	0.9±0.1
1-YEAR	0.9±0.1	0.7±0.1

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