

Improper Tooth Brushing: Impact on Oral Structures

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Abstract

Toothbrushing is an important tool for oral hygiene maintenance. Toothbrushes should be used judiciously else there are high chances for trauma both, to the soft tissues as well as hard tissues. This review deals with effects of improper toothbrushing on oral structures. It also provides an insight into the recommended brushing force and brushing duration for effective oral hygiene maintenance.

Keywords: Toothbrushing, hard tissues, soft tissues.

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INTRODUCTION

Improper use of the tools that prevent tooth decay and gingival disease can also produce harmful effects. For example, dental floss can cause inflammation; toothbrushes could cause abscesses; and water-irrigation devices might drive foreign material into soft tissue [1].

Improper toothbrushing technique can cause injury to the teeth as well as supporting tooth structure [2].

Toothbrush Trauma on the Gingiva

Acute Alterations

Precipitating Factors

- Horizontal or vertical scrub toothbrushing method with pressure.
- Over-vigorous placement and application of toothbrush.
- Penetration of gingiva by filament ends.
- Application of filament beyond attached gingival.

Appearance of Acute Lacerations

- Scuffed epithelial surface with denuded underlying connective tissue.
- Punctate lesions that appear as red pinpoint spots.

Chronic Alterations

- Recession.
- Changes in gingival contour.

RECESSION

Recession may be defined as “the apical migration of the gingival leading on to exposure of cementum.”

Predisposing Anatomic Factors May Be:

- Mal-positioning of teeth.
- Narrow band of attached gingival.

Recession usually appears on facial gingiva. It is proportional to right or left handedness of the patient. The area's most commonly involved are canines or teeth in labio or bucco version.

Changes in Gingival Contour

It may exhibit as:

- Rolled, bulbous, hard firm marginal gingival.
- Gingival cleft.

Precipitating Factors May Be

- Repeated use of vigorous rotary, vertical, or horizontal tooth brushing method over a long period of time.
- Use of a long, brisk stroke with excessive pressure over a long period of time.
- Habitual prolonged brushing in one area.
- Excessive pressure applied with worn non-resilient brush.

Suggested Corrective Measures

- Use of softer toothbrush.
- Demonstration of proper brushing technique.

Toothbrush Trauma on Teeth Abrasion of Teeth

Abrasion is loss of tooth substance produced by mechanical wear other than by mastication, or it may be defined as “the pathologic wearing away of tooth substance through some abnormal mechanical process.” Abrasion appears as saucer shaped or wedge shaped indentations with smooth shiny surfaces.

RECOMMENDED BRUSHING FORCE

Studies have shown that brushing force with powered toothbrushes to be lower than manual toothbrush [3]. There is an approximately 1 N difference between manual and powered toothbrushes. A force range of .75-3 N using powered toothbrush was effective in plaque removal [4]. An increase in efficacy was observed with raising brushing force from 1 N to 3 N. Studies showed that increase in brushing force removed more plaque. 300 grams seems to be most effective brushing force when using a manual toothbrush for both children and adults. Forces exceeding 300 grams tend to cause pain and gingival bleeding [5]. The more force is used, more effective was plaque removal. However efficacy was reduced when forces greater than 4 N was used. Brushing force is not the sole factor that determines efficacy. Other factors such as action of brush, size of brush head, brushing time, and manual dexterity may be of greater importance [6].

RECOMMENDED FREQUENCY AND DURATION OF TOOTHBRUSHING

In the controlled and supervised environment of clinical research where well trained individuals remove all visible plaque, gingival health can be maintained by one thorough cleaning exercise with brush, floss and toothpicks every 24 to 48 hours [7]. The average cleaning lasts less than 2 minutes every day and removes only 40% of plaque [8]. Several studies report improved plaque removal and therefore improved periodontal health associated with increasing frequency of brushing up to twice per day [9]. Cleaning three or more times per day does not appear to further improve periodontal conditions. Cleaning once a day with all necessary tools is sufficient if it is performed meticulously. If plaque control is not adequate, a second brushing will help. Usually the time recommended is 2 minutes but many studies have concluded that most of the patients hardly brush over 1 minute. If any one of the method of brushing is followed judiciously, then it would take 3-5 minutes to effectively brush the entire dentition. Patients usually believe they spend more time than they actually do. The best estimate of actual manual brushing time seems to be in range between 30-60 seconds.

Emphasis must be placed on the efficiency of complete plaque removal at least once per day, rather than frequency of brushing alone. However, poor

performance of plaque removal can be improved by brushing twice per day.

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