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Interdental Aids in Periodontics - An Overview

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Abstract

Achieving optimal control over plaque is crucial for the effectiveness of both nonsurgical and surgical periodontal therapy. Brushing alone is insufficient to achieve this; additional interdental cleaning tools are necessary. There are many different types of interdental aids, including water jets, oral irrigators, rubber tips, wooden toothpicks, interdental brushes, and dental floss. Each of these has unique benefits and drawbacks. The size of the interproximal space, along with the individual's acceptance, dexterity, and motivation, all influence the selection of the appropriate interproximal cleaning aid. Consequently, the dentist can offer guidance tailored to the specific characteristics of each patient.

Keywords: Brushing; water jets; oral irrigators; rubber tips; wooden tooth picks; interdental brushes; dental floss

Introduction

Good mechanical plaque control is crucial for preventing dental caries and periodontal disease, as well as maintaining overall oral health [11]. Educating patients on effective brushing and flossing techniques is essential for maintaining dental hygiene [10]. Oral hygiene is vital for preserving oral health, as it eliminates microbial plaque and prevents accumulation on teeth and gingiva. Self-performed plaque removal with a toothbrush is insufficient, so using interdental cleaning tools like dental floss, brushes, sticks, and irrigators is effective. These tools reach areas that a toothbrush alone cannot, ensuring a more thorough cleaning of spaces between teeth. The choice of an interdental aid depends on factors such as the interdental space size, individual preferences, ease of use, and motivation, and can be influenced by dental professional recommendations. Regular use of interdental aids can significantly reduce periodontal disease risk and improve overall oral hygiene [15]. An embrasure, which is a V-shaped contact area formed by the contours of adjacent teeth's proximal surfaces, is commonly an inaccessible area during routine toothbrushing.

Types of Embrasure

1. Occlusal embrasure.
2. Gingival embrasure.
3. Lingual embrasure.
4. Buccal embrasure.

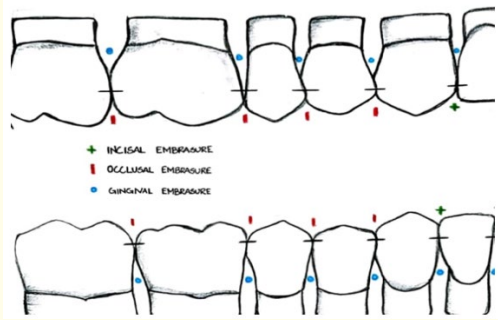

Figure 1: Types of embrasure.

Types of gingival embrasures

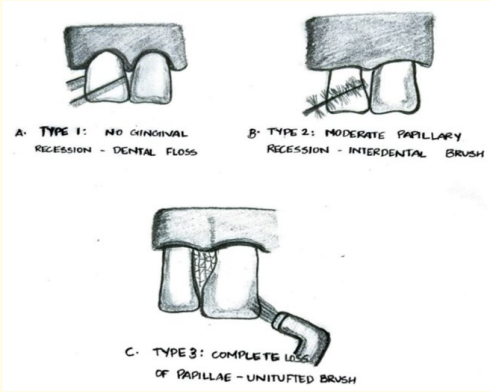

Figure 2: Types of gingival embrasures.

Types of interdental cleaning aids

There are many interdental cleaning aids, such as dental floss, interdental brushes, oral irrigators, wooden sticks assist in plaque removal [10].

Dental Floss

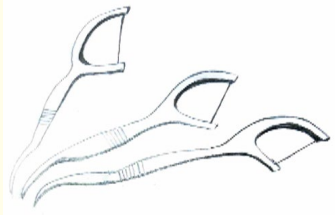

Figure 3: Dental Floss.

Dental floss usage is low among adults, ranging between 10% and 30%. This is due to the difficulty of flossing, particularly in areas with tight contact points [11]. Floss is a cord that must be gently inserted beneath the contact point of teeth and used in a to-and-fro or up down motion to remove plaque. It is beneficial in teeth with close contacts and densely packed areas. Because it is technique-dependent, patient compliance and acceptance are extremely low. Additionally, when not used properly, it carries the risk of injuring the gums. Dental floss has long been accepted as having a beneficial effect on plaque removal. Dental flossing helps to removes subgingival plaque 2-3.5 mm below the tip of papilla [10]. The effect of flossing as an adjunct to toothbrushing has no sufficient evidence to support that flossing plus toothbrushing has more beneficial effects on plaque or gingivitis than toothbrushing alone [15].

Types

1. Thread floss.
2. Waxed and unwaxed floss.
3. Flavoured and unflavoured floss.
4. Tape floss (dental tape).
5. Super flosses.
6. PTFE (Polytetrafluoroethylene) floss.
7. Biodegradable and natural floss.

Technique

1. Start with a piece of floss long enough to grasp securely; 12-18 in. is usually sufficient. It may be wrapped around the fingers, or the ends may be tied together in a loop.
2. Stretch the floss tightly between the thumb and forefinger or between both forefingers, and pass it gently through each contact area with a firm back-and-forth motion. Do not snap the floss past the contact area because this may injure the interdental gingiva. In fact, zealous snapping of floss through contact areas creates proximal grooves in the gingiva.
3. Once the floss is apical to the contact area between the teeth, wrap the floss around the proximal surface of one tooth, and slip it under the marginal gingiva. Move the floss firmly along the tooth up to the contact area and gently down into the sulcus again, repeating this up-and-down stroke 2 or 3 times. Then, move the floss across the interdental gingiva, and repeat the procedure on the proximal surface of the adjacent tooth.
4. Continue through the whole dentition, including the distal surface of the last tooth in each quadrant. When the working portion of the floss shreds or becomes dirty, move to a fresh portion of floss [3].

Interdental Brushes

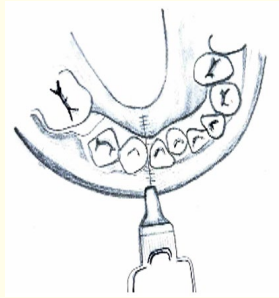

Figure 4: Interdental Brushes.

Interdental brushes were found that they were effective in plaque removal as far as 2-2.5 mm below the gingival margin. It consists of a metal wire core at centre, with soft nylon filaments which is twisted around the metal wire [11]. IDBs have been extremely effective at cleaning interproximal area [10]. Inter-dental brushes along with toothbrushing showed a significant change in plaque removal as compared to brushing alone [16]. Cleaning with interdental brushes is the most effective method for interproximal plaque removal than flossing or wooden sticks. The advantages of interdental brushes are higher efficacy of plaque removal and high patient acceptance, as well as ease of use [11].

Types

1. Pink 0.4 mm.
2. Orange 0.45 mm (PHD: <= 0.8 mm).
3. Red 0.5 mm (PHD: 0.9-1.0 mm).
4. Blue 0.6 mm (PHD: 1.1-1.2 mm).
5. Yellow 0.7 mm (PHD: 1.3-1.5 mm).
6. Green 0.8 mm (PHD: 1.6-1.8 mm).
7. Violet 1.1 mm (PHD: >1.9 mm).
8. Grey 1.3 mm.

Technique

1. Interdental brushes are inserted through interproximal spaces and moved back & front between the teeth with short strokes. The diameter of brush should be slightly larger than the gingival embrasures to be cleaned. This size should allow bristles to exert pressure on both proximal tooth surfaces.
2. Single-tufted brushes provide access to furcation areas, or isolated areas of deep recession, and work well on the lingual surfaces of mandibular molars and premolars. These areas are often uncleaned when using a toothbrush and floss [3].

Wood sticks

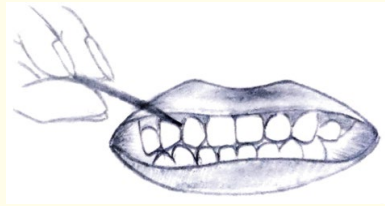

Figure 5: Wood sticks.

Wooden sticks are made of soft wood to facilitate adaptation to the interdental space and to prevent injury of gingiva [10]. Wooden sticks are designed for mechanical removal interdental plaque and it is achieved by rubbing against proximal tooth surfaces. It can able to remove plaque up to 2-3 mm subgingivally by depressing the papilla. The advantages of toothpicks/wooden sticks include ease of use and convenience. They may be more acceptable to older patients, especially those who routinely use toothpicks to remove food debris after eating [11].

Technique

1. Once mounted on the handle, the toothpick is broken off so that it is only 5- or 6-mm long. The tip of the toothpick is used to trace along the gingival margin and into the proximal areas from both the facial and the lingual surface of each tooth. Toothpicks can penetrate into periodontal pockets and furcation, and permit patients to target their hygiene efforts at the gingival margin.
2. The triangular wooden pick should be repeatedly moved in and out of the embrasure several times to remove the biofilm. The disadvantage of triangular wooden or plastic tips is that they do not reach well into the posterior areas or on the lingual surfaces.
3. Rubber tips should be placed into the embrasure space, resting on the gingiva, and used in a circular motion. They can be applied to interproximal spaces and other defects throughout the mouth and are easily adaptable to lingual surfaces [3].

Oral Irrigators

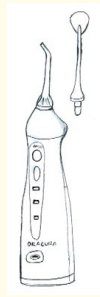

Figure 6: Interdental Brushes.

The oral irrigator is one of the interdental cleaning aids developed to enhance the effectiveness of plaque control and to bring benefits for gingival health [16]. Oral irrigator helps to remove plaque and soft food debris from the mouth using a mechanical jet of water [10]. The mechanical mode of action of oral irrigators is through a combination of pulsation and pressure. It provides phases of compression and decompression of gingival tissue, eliminating supragingival plaque and flushing out subgingival bacteria and other debris [11].

Types

1. Supra-gingival irrigators.
2. Sub-gingival irrigators.

Technique

Supra gingival

1. Patients should be instructed to aim the pulsating jet across the proximal papilla, hold it there for 10 to 15 seconds, trace along the gingival margin to the next proximal space, and repeat the procedure.
2. The irrigator should be used for both the buccal and lingual surface.
3. Patients with gingival inflammation should begin at low pressure, and they can increase the pressure comfortably to about medium as tissue health improves.

Sub gingival

1. The soft rubber irrigator tip reduces the pressure and flow of the pulsating jet of water when it is inserted subgingivally, and it permits penetration of irrigant to up to 70% of pocket depth in laboratory simulations. The subgingival irrigation tip should be gently. The inserted into pockets or furcation areas, 3 mm if possible, and each pocket should be flushed for a few seconds [3].

Interdental Aids for Implant Patients

Figure 7: Interdental aids for implant patients.

To maintain implant health and prevent peri-implant diseases, use gentle, non-abrasive tools like plastic/rubber-coated interdental brushes, water flossers, soft silicone picks, and implant-specific floss. Avoid metal/uncoated tools to prevent surface damage. Tailor tools to prosthesis design and emphasize patient training for proper technique. Use antimicrobial rinses for biofilm control and regular professional cleanings with implant-safe instruments. Prioritize gentle cleaning to reduce inflammation and ensure long-term implant success.

Patient Compliance

An all-purpose aid is not available, and there is no single aid that is suitable for everyone. The best approach is to integrate clinical judgment with scientific evidence through patient interaction to determine the optimal course of action. Factors such as morphology, accessibility, personal preferences, and skills vary, so findings must be tailored to specific circumstances. Patient acceptance is essential for the long-term use of interdental cleaning devices. Patients favored interdental brushes and water flossers over dental floss, despite their tendency to flex, buckle, and distort [16].

Future of Interdental Aids

Recent advancements in interdental aids aim to improve plaque removal and ergonomic design and address specific needs, such as orthodontic appliances or implants. These aids include brushes, water flossers, floss picks, and threaders. Oral irrigation device designs and sprays are also being developed. Interdental brushes are made with plastic cores with soft elastomeric fingers. Future aids will incorporate microtechnology, microsensors, and advanced cleaning systems. As these innovations continue to evolve, they will likely enhance user experience and effectiveness in maintaining oral hygiene. Additionally, personalized recommendations based on individual dental conditions may become standard, ensuring that everyone can achieve optimal oral health.

Conclusion

Interdental aids are crucial for maintaining gingival health and oral hygiene. The evidence clearly highlights the significant advantages of using interdental aids for enhancing oral health, particularly when it comes to reducing gingivitis and plaque. Interdental brushes emerge as the superior choice, demonstrating impressive reductions of 34% in gingivitis and 32% in plaque scores compared to traditional dental floss. Research indicates that interdental aids, when combined with brushing, can effectively reduce plaque and gingivitis, especially for individuals with wider interdental spaces. Meanwhile, oral irrigators contribute positively by promoting qualitative changes in subgingival plaque, suggesting their role in a comprehensive oral hygiene regimen. Although wooden sticks and brushing can effectively reduce bleeding scores, their inability to show substantial plaque reduction underscores the importance of choosing the right tools for optimal oral health. Ultimately, integrating these effective interdental aids into daily routines not only fosters healthier gums but also contributes to a more thorough approach to maintaining overall dental hygiene. There is no single cleaning aid that works best for all patients.

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