ACCESSORY INTERDENTAL CLEANING AIDS IN PLAQUE CONTROL

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ABSTRACT

Eliminating the dental plaque is the key to prevent the occurrence of periodontal disease and preservation of healthy periodontium. The dental and periodontal diseases predominantly originate in interproximal area; hence interdental plaque removal is a useful aid to control its occurrence. Tooth brush cannot accomplish plaque removal for the interproximal tooth surfaces and adjacent gingiva to the same degree that it does for the facial, lingual and palatal aspects. Therefore, it is essential to augment tooth brushing with special interdental cleaning aids like dental floss, interdental brushes, tooth pick and other newer techniques like water flosser and air floss. The choice of use of these aids depends largely on the size and shape of interdental embrasures, the contour and consistency of gingival tissues, the morphology of proximal tooth surface and the tooth position and alignment in oral cavity. Also, ease of its use and patient cooperation are important considerations.

INTRODUCTION

The term ‘Oral hygiene’ was first introduced by M.L.Rhein. Oral hygiene is important for the preservation of oral health, whereby microbial plaque is removed and prevented from accumulating on teeth and gingiva. The role of plaque in the etiology and progression of periodontal disease involvement is undisputed.

Periodontal lesions are predominantly progresses in the interproximal or interdental sites. These are major areas where plaque accumulation occurs. The interproximal areas are affected by caries also, it is prudent to maintain these area meticulously clean.

The primary means of plaque control is through mechanical action. The toothbrush is designed to achieve maximal plaque control. Although the toothbrush is successful in removing plaque at buccal, lingual and occlusal surfaces, its utilization in interproximal area is restricted.[1]

Embrasures

V-shaped spillway next to the contact area of adjacent teeth; narrowest at the contact and widening toward the facial, lingual, and occlusal contacts.

For the purpose of convenience of recommendation of devices, interdental embrasure areas are categorized into different groups and classified as[2]:

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<th>Types of embrasures</th>
<th>Condition of the gingiva in embrasures</th>
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<td>Type I Embrasure</td>
<td>Embrasures are occupied by healthy interdental papilla.</td>
<td>Dental floss is used.</td>
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<td>Type II Embrasure</td>
<td>Slight to moderate degrees of recession.</td>
<td>Interdental brush and wooden toothpicks are effective.</td>
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<td>Type III Embrasure</td>
<td>Extensive recession or complete loss of interdental papilla.</td>
<td>Bristle ended untufted brushes and thick spiral interdental brushes.</td>
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[1] M.L.Rhein

[2]
C. Single-tufted brushes clean efficiently in interproximal spaces with no papillae

**Dental floss**

In 1815 an American dentist, Dr. Levi Spear Parmly introduced the idea of using waxed silken thread as floss.

**Types of Dental Floss**

- **Waxed dental tape** - Embrasures II,III, Loose contact, large surface area, can be used with dentifrice.
- **Waxed dental floss** - Embrasure I, around rough tooth surface and restorations.
- **Unwaxed round floss** - Embrasure I, tight contacts.
- **Tufted super floss (stiff end)** - Embrasure II,III, Fixed bridge (stiff end), exposed furcation, orthodontic appliances, implant prosthesis.
- **Colored floss** - visualization of plaque and debris, used by beginner, used by those with weak eyesight.
- **Flavored floss** - more appealing, lack of motivation.
- **Impregnated floss tape containing fluoride, herbal extracts, abrasives, antibiotics** - caries control, therapeutic effect on gingiva

**Method to use Dental floss**

1. Spool method
2. Circular or Loop method

**Precautions**

Pressure in col area & Preventing floss cuts and floss clefts

**Battery-powered Interdental Cleaner**

Single bristle. The tip is inserted into the interproximal space and a bristle or wand comes out of the tip and moves in a circular & elliptical motion. The device moves the prestrung floss in short motions to provide interproximal cleaning.

**Floss threaders** it has a eye loop at one end, into which the dental floss is passed. It is used to clean Fixed partial dentures. The floss is passed through the eye end.

**Tuzted dental floss**

- **Circular or Loop method**

**Interdental Brushes (Proxa-brush)**

In 1980s: The first interdental brush is invented as an alternative to flossing by Dr. John O. Butler.

**Types**

- **Small insert brushes with reusable handle** - small tapered or cylindric brush head are of varying sizes approximately 12 to 15 mm (1/2 inch) in length, with a diameter of 3 to 5 mm (1/8 to ¼ inch)
- **Brush with wire handle** - wire is continuous with handle 35 to 45 mm (1 ½ to 1 ¾ inches) in length. Filaments form narrow brush approximately 30 to 35 mm (1 ¼ to 1 ½ inch) in length and 5 to 8 mm (1/4 to 5/16 inches) in diameter.
- **Various shapes** –
  - Cylindrical / conical
  - Wide / narrow
- **Indications for use** - Removal of dental biofilm and debris from –
  - 1. Open embrasure and areas hard to reach by regular tooth brush.
  - 2. Exposed grade IV furcations
- **Applications of chemotherapeutic agents**
  - 1. Fluoride dentifrice / gel / mouthrinse
  - 2. Antibacterial agents
  - 3. Desensitizing agents
Accessory Interdental Cleaning aids In Plaque Control

Jared et al. (2005)\(^6\) Compared the efficacy of interproximal cleaning devices for plaque and gingivitis reduction and decreased frequency in interproximal bleeding. Daily use of IDB was effective in reducing interproximal plaque and gingivitis scores as well as interproximal bleeding on probing. Ishak and Watts (2007)\(^7\) Compared the efficacy of interdental brushes and dental floss. The use of IDB and dental floss resulted in similar beneficial effects on subgingival plaque and proximal gingival health.

Systematic review by Imai PH, Yu X, Mac Donald D (2012)\(^8\) concluded that interdental brush is an effective alternative to dental floss for reducing interproximal bleeding and plaque in clients with filled or open embrasures.

Interdental Brushes (Proxa-brush)

### Single-Tuft Brush (End-Tuft, Untuft)

**Indications**
- For open interproximal areas
- For fixed dental prosthesis
- For difficult to reach areas

![Interdental Brushes (Proxa-brush)](image)

**Toothpick in holder (Perio-aid)**

**Indications**
- Cleaning of gingival margins
- Furcations
- Orthodontic Patient

**Method to use perio-aid**
- Tooth pick is broken off so that it is only 6 to 7 mm long.
- Tip of tooth pick is used to trace along gingival margin and into the proximal areas from facial and lingual surface of each tooth.

![Toothpick in holder (Perio-aid)](image)

**Wooden/plastic Interdental Cleaner/wedge (Stimudent)**

For cleaning proximal tooth surfaces where the tooth surfaces are exposed and interdental gingiva are missing.

**Method to use stimudent**
- Place it from buccal aspect in the interdental space with base of triangle resting on gingiva.
- Use finger pressure to prevent applying too much pressure of the tip of the stick against the gingiva.

![Stimudent](image)

**Interdental rubber tip stimulators**

Conical or Pyramidal flexible rubber tip is attached to the end of the handle of a toothbrush or on a special plastic handle.

**Water Flosser**

In 1962, oral irrigator or waterpik was introduced by Dentist Dr. Gerald Moyer and an engineer John Mattingly. Water Flosser is the next generation of Waterpik.

**Types of water floss**\(^9\)
- With cord
- Cordless water floss

![Water Flosser](image)
Mechanism of action

- By application of pulsed or steady stream of water (50–90 psi range).
- **Pulsation** and **pressure** are critical components of irrigating device. \(^{[1]}\)
- Two zones of hydrokinetic activity.
  
  a. **Impact zone** – where solution initially contacts the area.
  
  b. **Flushing zone** – where solution reaches the subgingival sulcus.

Airfloss

Micro-droplets of liquid using compressed air are sprayed interdentally at high speed in one direction. The activated bursts of air, interspersed with small micro droplets of water, (microbursts of high pressure spray) helps in cleaning proximal areas of teeth.

Holley TJ, Ross JA and Hottel TL(2014)\(^{[6]}\) compared the difference in reduction of an interproximal surface coating with the use of Sonicare Airfloss, tooth brushing or dental flossing. The authors concluded that among all groups, when used as a single removal method, Sonicare Airfloss resulted in the least removal of the surface coating when compared to either tooth brushing or flossing.

CONCLUSION

- Patient compliance is a major issue to be considered when it comes to long-term use of interdental cleaning devices.
- "Reinforcement of these daily plaque control aids, practices and routine visits to the dental office for maintenance care are essential for successful microbial plaque control and long-term success of periodontal therapy."

References


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