

ACCESSORY INTERDENTAL CLEANING AIDS IN PLAQUE CONTROL

Shubhangi Rajbhoj<sup>1</sup> and Jyotsna Anjankar<sup>2</sup>

<sup>1</sup>Department of Periodontics, Sinhgad Dental College & Hospital, Pune

<sup>2</sup>Periodontology & Implantology, Private Practitioner, Mumbai

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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.

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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.

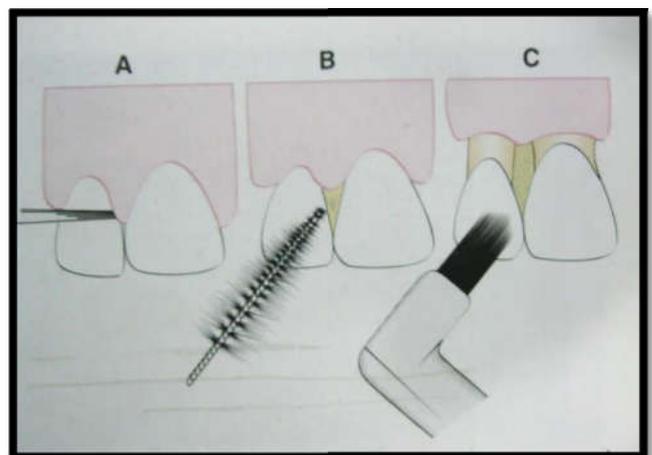
The primary means of plaque control is through mechanical action. The toothbrush is designed to achieve maximal plaque control. Although the toothbrush is successful in removing plaque at buccal, lingual and occlusal surfaces, its utilization in interproximal area is restricted.<sup>[1]</sup>

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<sup>[2]</sup>:

Types of embrasures	Condition of the gingiva in embrasures	Cleaning aids recommended for embrasure cleaning
Type I Embrasure	Embrasures are occupied by healthy interdental papilla.	Dental floss is used.
Type II Embrasure	Slight to moderate degrees of recession.	Interdental brush and wooden toothpicks are effective.
Type III Embrasure	Extensive recession or complete loss of interdental papilla.	Bristle ended unitufted brushes and thick spiral interdental brushes.



- A. Embrasures with no gingival recession
- B. Larger spaces with exposed root surfaces require the use of an interproximal brush

\*Corresponding author: Shubhangi Rajbhoj  
Department of Periodontics, Sinhgad Dental College & Hospital, Pune

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 use 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.



Floss threaders

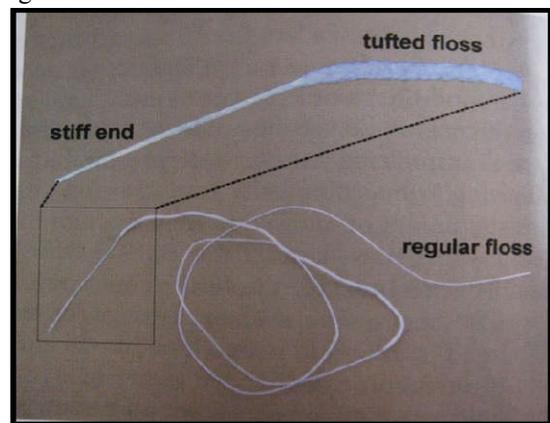
Terezhalmly GT, Bartizek RD, Biesbrock AR (2008)<sup>[3]</sup> examined plaque removal in 25 subjects following single use with manual toothbrush alone and in combination with four floss products. The authors stated that all four floss products in combination with a manual toothbrush removed plaque significantly better than the toothbrush alone. Among floss types, there was evidence of superiority for the powered flosser, but there were no significant treatment differences between the three traditional floss products.

Berchier *et al* (2008)<sup>[4]</sup> conducted a systematic review of scientific literature to investigate the efficacy of dental floss as an adjunct to toothbrushing on plaque and parameters of gingival inflammation, in adults with periodontal disease. The authors stated that dental professional should determine, on an individual patient basis, whether high-quality flossing is an achievable goal. It is concluded that a routine instruction to use floss is not supported by scientific evidence

**Tufted dental floss**<sup>[5]</sup> (Floss/yarn combination- Regular dental floss is alternated with a thickened tufted portion) eg - Super floss- 2 foot length composed of 5 inch tufted portion adjacent to 3 inch stiffened end. Used in Fixed appliance or orthodontic attachment.

NUFloss- roll like regular floss and has a cutting device to allow selection of preferred length. Tufted portion (1 inch long) alternate with plain floss (1 ½ inch long)

Knitting yarn, Gauze strip can also be used in interdental flossing.



Tufted dental floss

### 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 8mm (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

Jared *et al.* (2005)<sup>[6]</sup> 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)<sup>[7]</sup> 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, MacDonald D (2012)<sup>[8]</sup> 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, Unituft)

##### Indications

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



Single-Tuft Brush

#### 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.

- The tooth pick is repeatedly moved in & out of the embrasure to remove plaque.



Perio-aid

#### 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

#### 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<sup>[9]</sup>

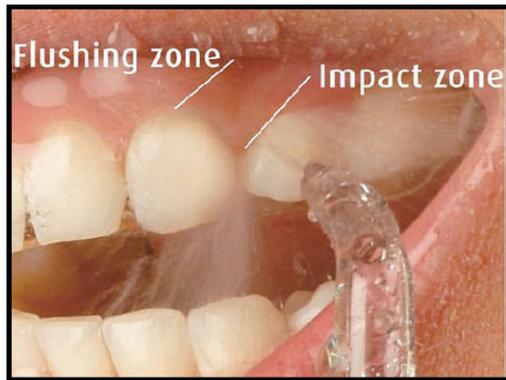
- With cord
- Cordless water floss



Waterpik

### 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.<sup>[3]</sup>
- Two zones of hydrokinetic activity.
  - a. **Impact zone** – where solution initially contacts the area.
  - b. **Flushing zone** – where solution reaches the subgingival sulcus.



Mechanism of action of Waterpik

### 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.



Airfloss

Holley TJ, Ross JA and Hottel TL(2014)<sup>10</sup> 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, SonicareAirfloss 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."

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