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### **Oral hygiene measures (mechanical plaque control)**

**Acquired pellicle** is a structureless film of salivary glycoproteins selectively adsorbed to the tooth surface and is visible within minutes following a polish with pumice. The formation of pellicle is accompanied by bacterial colonization as microorganisms in saliva adsorb to the pellicle.

**Dental plaque** is defined as the soft deposits, non-mineralized that form the biofilm adhering to the tooth surface or other hard surfaces in the oral cavity, which is so tenaciously adherent to the surfaces that it resists removal by salivary flow or a gentle spray of water across its surface. It is composed of bacterial cells, protein, extracellular matrix and epithelial cells from saliva and crevicular fluid. It's broadly classified as supra gingival or sub gingival based on its position on the tooth surface.

**Dental calculus** represents the mineralized bacterial plaque and can be recognized as supra gingival or sub gingival calculus.

**Plaque control** is the removal of microbial plaque and the prevention of its accumulation on the teeth and adjacent gingival tissues, it also deals with the prevention of calculus formation and leads to resolution of gingival inflammation. Thus, Plaque control is an effective way of treating gingivitis and therefore is a critical part of all the procedures involved in the treatment and prevention of periodontal disease. Plaque control includes mechanical procedures (includes tooth

brushing and interdental cleaning aids and professional prophylaxis) and chemical agents which retards plaque formation.

In periodontal therapy, plaque control serves two purposes:

1. To minimize gingival inflammation.
2. To prevent recurrence or progression of periodontal disease in treated mouth.

The process of plaque control requires motivation on the part of the patient, education and instruction, followed by encouragement and reinforcement.

### **Mechanical plaque control aids include:**

**Toothbrushes:** They were first introduced in China as early as 1600 B.C. Through the years toothbrushes have undergone changes in many ways as possible. By early nineteenth century the handles were constructed from gold, Ivory or ebony in which replaceable brush heads could be fitted. Nylon bristles came into use in 1938 to replace the natural bristles.

### **Types of toothbrushes:**

- Manual toothbrush.
- Powered toothbrush.
- Sonic and ultrasonic toothbrush.
- Ionic toothbrush.

**Manual toothbrush:** It should be easily and effectively manipulated, inexpensive.

### **Parts of toothbrush:**

1. **Handle:** The part grasped in the hand during tooth brushing.
2. **Head:** The working end of a toothbrush that holds the bristles.
3. **Tufts:** Clusters of bristles secured into head.
4. **Shank:** The section that connects head and handle.

**Toothbrush bristles** either natural from hair of hogs or synthetic from nylon (not larger than 0.23 mm in diameter) which are uniform in size and elasticity, resistant to fracture. Rounded bristles ends cause fewer scratches on the gingiva. The type of brush is a matter of individual preference. A toothbrush should be able to reach and clean most areas of teeth. For maintenance of toothbrush; most brushes wear out in three months and should be replaced, it should be stored in dry areas and cleaned in antiseptic mouthwashes.

### **Tooth brushing methods:**

➤ **Bass method:** It is the most widely accepted and most effective method for dental plaque removal, adjacent and directly beneath the gingival margin. The technique is place the bristles at 45° angle to the gingiva and move in in back and forth motions. Strokes are repeated around 20 times.

**Advantages:** Effective method for removing plaque from the cervical area beneath the height of contour of enamel, easy to learn, provides good gingival stimulation and recommended for patient with or without periodontitis.

➤ **Modified Bass technique:** This technique combines the circular motions of Bass technique with the sweeping motion of the Roll technique. It has sweeping motion from cervical to incisal or occlusal surface. The bristles are gently vibrated by moving the brush handle in a back and forth motion.

**Advantages:** Good interproximal, gingival and sulcus cleaning as well as good gingival stimulation.

➤ **Stillman's method:** technique is place the bristles at apical direction to the teeth with circular motion.

**Advantages:** It is used for massage and stimulation of gingiva and for cleaning the cervical area of the teeth.

- **Modified Stillman's method:** The bristles are positioned partly on the cervical portion of teeth and partly on the adjacent gingiva in an apical direction with an oblique angle to the long axis of the tooth. Roll the brush down to the crown of the tooth.
- **Advantages:** It is recommended for cleaning in areas with progressing gingival recession and root exposure to prevent abrasive tissue destruction.
- **Charters method:** A soft or medium multitufted tooth brush is indicated with bristles pointed toward the crown at 45° to the gingiva, the back and forth motion is used, the tips of bristles should not cross the gingiva.

**Advantages:** It is recommended for temporary cleaning in areas of healing wounds after periodontal surgery and for gingival massage.

- **Scrub brush method:** This requires vigorous horizontal, vertical and circular motions. It is not very effective in plaque removal.
- **Roll technique or sweep method:** The bristles are placed at 45° angle and lightly rolled across the tooth surface toward the occlusal surface. It is indicated for children and for individuals with limited dexterity.

**Advantages:** It works fairly well for patients with anatomically normal gingival tissues.

- **Fones method or circular scrub method:** The tooth brushing is in circle motion on the teeth, making sure that the teeth and gums are covered.

**Advantages:** It is recommended for children and physically or emotionally handicapped individuals.

➤ **Vertical method or Leonard's method:** The bristles of toothbrush are placed at 90° angle to the facial surface of the teeth. The motion is vertical up and down brushing movements on the facial surface of the clenched anterior and posterior teeth.

**Advantages:** Most convenient and effective for small children.

**Powered toothbrush:** These were introduced in 1960's. It makes rapid automatic bristle motions, either back-and-forth oscillation or rotation-oscillation (where the brush head alternates clockwise and counterclockwise rotation), in order to clean teeth. Powered toothbrushes are not superior to manual. The indications for uses are:

- Young children.
- Disabled patients.
- Individuals lacking manual dexterity.
- Patients with prosthodontics, or orthodontic treatment as well as implants.
- Patients on supportive periodontal treatment.
- Institutionalized elderly peoples.

- **Sonic and ultrasonic toothbrush:** These types produce high frequency vibrations (200-400 HZ for sonic and 1.6 MHZ for ultrasonic), which lead to the phenomenon of disruption of bacterial cell wall (bactericidal) and aids in stain removal.
- **Ionic toothbrush:** This type changes the surface charge of a tooth by influx of positively charged ions. The plaque with similar charge is repelled from the tooth surface and is attracted by the negatively charged bristles of the toothbrush. It indicates a brush that aims to impart an electrical charge to the tooth surface with the intent of disrupting the attachment of dental plaque.

### **Objectives of toothbrushing:**

1. To clean teeth and interdental spaces.
2. To prevent plaque formation.
3. To disturb and remove plaque.
4. To stimulate and massage gingival tissues.
5. To clean the tongue.

## **Effects of improper tooth brushing:**

### **1. Gingival alterations include:**

- Acute lacerations.
- Chronic alterations.
- Recession.
- Change in gingival contour.

**Corrective measures:** Use of soft toothbrush and change of brushing method.

**2. Abrasion of the teeth:** It means the loss of tooth substance produced by mechanical wear other than by mastication. The contributing factors are: hard toothbrush, horizontal brushing, abrasive agents in dentifrice, excessive pressure during brushing and prominence of the tooth surface labially or buccally. The abraded areas are on the cervical areas of exposed root but may occur on enamel.

**Corrective measures:** Recommend a less abrasive dentifrice, change the tooth brush method and advise the patient to use soft texture bristles.

**Interdental Cleaning aids:** The toothbrush does not completely remove interdental plaque either in healthy or periodontal involved patients. Interdental cleaning is crucial to augment the effect of tooth brushing.

### **Factors affecting the selection of interdental cleaning aids:**

- Type of gingival embrasures.
- Alignment of teeth.
- Fixed prosthesis or orthodontic appliances.
- Open furcation areas.
- Contact areas.

**Dental floss:** It is used to remove plaque from interproximal surfaces in which the embrasure is completely occupied by healthy interdental papilla. There are many types either waxed, unwaxed, flavored or tape.

**Function of dental floss:**

1. Remove of adherent plaque and food debris to teeth and others.
2. Reducing gingival bleeding.
3. Improving oral hygiene.
4. Massaging the interdental papillae.
5. Helping in locating calculus, overhanging restorations and proximal carious lesion.
6. Polishing of tooth surfaces during plaque removal.

**Wooden tips:** They are placed in the interdental space in such a way that the base of triangle toward the gingiva and the sides are in contact with the proximal surfaces.

**Interdental brushes:** These brushes are suitable for cleaning large, irregular tooth surfaces adjacent to wide interdental spaces and may also be used to clean furcation areas.

**Miswak (Siwak):** It provides both mechanical (bristles) and chemical (antimicrobial agents) measures for plaque control.

**Oral irrigation devices:** These devices are beneficial in the removal of unattached plaque and debris. They may also be used to deliver antimicrobial agents such as chlorhexidine.

**Gingival massage:** Massaging the gingiva with toothbrush produce epithelial thickening and increased keratinization.