Preventive Dentistry

Lecture (22)

5th stage

Oral hygiene measures (mechanical plaque control)

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. Nylon bristles flex as many as 10 times more often than natural bristles before breaking; they do not split or abrade and are

easier to clean. The shape and stiffness of nylon bristles can be standardized. Natural bristle diameters vary greatly in each filament.

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:** The bristles are positioned apically along the long axis of the tooth. The edge of the brush head should be touching the facial or lingual aspect of the tooth. The brush is slightly rotated at a 45- degree angle and vibrated over the crown.

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:** The bristles are placed at a 45- degree angle toward the occlusal or incisal surface of the tooth. The bristles should touch at the junction of the free gingival margin and tooth. A circular vibratory motion is then activated.

  Advantages: It is recommended for temporary cleaning in areas of healing wounds after periodontal surgery and effective for cleaning around devices used to correct improper contact of opposing teeth and plaque under abutment teeth.
- **Scrub brush method:** The teeth are placed edge to edge while the brush maintains a 90- degree angle to the long axis of the tooth. The brush is then moved in a horizontal stroke. This technique is known to cause excessive toothbrush abrasion.
- **Roll technique or sweep method:** The bristles are placed at 45° angle and lightly rolled across the tooth surface toward the occlusal surface. The edge of the brush head should be touching the facial or lingual aspect of the tooth. Then with light pressure, the bristles are rolled against the tooth from the apical position toward the occlusal plane. This motion is repeated several times; then the brush is repositioned on the next teeth with bristles overlapping a portion of the teeth previously cleaned. The heel or toe of the brush is used on the lingual aspect of the anterior teeth. 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 teeth are clenched, and the brush is placed inside the cheeks. The brush is moved in a circular motion over both maxillary and manibular teeth. In the anterior region, the teeth are placed in an edge-to-edge position and the circular motion is continued.

On the lingual aspect, an in- and- out stroke is used against all surfaces. This technique can be damaging if done too vigorously.

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 teeth are held in an edge- to- edge position. Next the toothbrush is moved in a vertical, vigorous motion up and down the teeth. The maxillary and mandibular teeth are brushed separately.

  Advantages: Most convenient and effective for small children.

  - **Powered toothbrush:** These were introduced in 1960's. Powered toothbrushes are not superior to manual. Most powered toothbrush manufacturers do not recommend a specific brushing method. However, some guidelines for using a powered brush are available. It is recommended that the brush be positioned slightly differently for each surface of the tooth. Each tooth and corresponding gingival areas should be brushed separately, always with light, steady pressure. Pressure should never be exerted on the bristles of a powered toothbrush because this could damage the tissues.

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.

Tongue brushing: The tongue is anatomically perfect for harboring bacteria. The tongue can transmit organisms during toothbrushing and infection or reinfection of a periodontal pocket. For these reasons, the tongue, especially those with fissuring or prominent papilla, should be regularly cleaned. Commercial tongue cleaners, made of plastic or a flexible metal, are also available. They are curved so they can be placed over the tongue without touching the teeth. These instruments are swept over the dorsum of the tongue to remove bacterial plaque and debris.