

# Chapter 1 Definition and Objectives of Periodontal Plastic Surgery

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Periodontal plastic surgery procedures are performed to prevent or correct anatomical, developmental, traumatic, or plaque disease-induced defects of the gingiva, alveolar mucosa, and bone (American Academy of Periodontology 1996).

## THERAPEUTIC SUCCESS

This is the establishment of a pleasing appearance and form for all periodontal plastic procedures. Treatment of mucogingival deformities requires gingival augmentation procedures that address both a functional and esthetic component for the patient (American Academy of Periodontology 2015).

## INDICATIONS

### Gingival Augmentation

This is used to stop marginal tissue recession resulting from periodontal inflammation, toothbrush abrasion, or naturally occurring or orthodontically induced alveolar bone dehiscences. It facilitates plaque control around teeth or dental implants (Schrott et al. 2009; Lin et al. 2013) or in conjunction with the placement of fixed partial dentures (Nevins 1986; Jemt et al. 1994).

### Root Coverage

The migration of the gingival margin below the cemento-enamel junction with exposure of the root surface is called *gingival recession*, which can affect all teeth surfaces, although it is most commonly found at the buccal surfaces (Murtoyma et al. 1987). Gingival recession has been associated with toothbrushing trauma, periodontal disease, tooth malposition, alveolar bone dehiscence, high muscle attachment, frenum pull, and iatrogenic dentistry (Wennstrom 1996). Gingival recessions can be classified in four categories based on the expected success rate for root coverage (Miller 1985):

- Class I: A recession not extending beyond the mucogingival line; normal interdental bone. Complete root coverage is expected.

- Class II: A recession extending beyond the mucogingival line; normal interdental bone. Complete root coverage is expected.
- Class III: A recession to or beyond the mucogingival line. There is a loss of interdental bone, with level coronal to gingival recession. Partial root coverage is expected.
- Class IV: A recession extending beyond the mucogingival line. There is a loss of interdental bone apical to the level of tissue recession. No root coverage is expected.

Root-coverage procedures are aimed at improving aesthetics, reducing root sensitivity, and managing root caries and abrasions.

### Augmentation of the Edentulous Ridge

This is a correction of ridge deformities following tooth loss (facial trauma) or developmental defects (Allen et al. 1985; Hawkins et al. 1991). It is used in preparation for the placement of a fixed partial denture or implant-supported prosthesis when aesthetics and function could be otherwise compromised. Ridge deformities can be grouped into three classes (Seibert 1993):

- Class I: A horizontal loss of tissue with normal, vertical ridge height
- Class II: Vertical loss of ridge height with normal, horizontal ridge width
- Class III: Combination of horizontal and vertical tissue loss

### Aberrant Frenulum

Frenectomy or frenotomy can be used to remove or apically reposition aberrant frenulum in order to close diastemas in conjunction with orthodontic therapy. It is used in treating gingival tissue recession aggravated by a frenum pull (Edwards 1977).

### **Prevention of Ridge Collapse Associated with Tooth Extraction (Socket Preservation)**

The maintenance of socket space with a bone graft after extraction will help reduce the chances of alveolar ridge resorption and facilitate future implant placement.

### **Crown Lengthening**

This is used when there is not enough dental tissue available (Yeh & Andreana 2004; Sharma et al. 2012) or to improve aesthetics (Bragger et al. 1992; Garber & Salama 1996; Sonick 1997).

### **Exposure of Nonerupted Teeth**

The procedure is aimed at uncovering the clinical crown of a tooth that is impacted and enable its correct positioning on the arch through orthodontic movement.

### **Loss of Interdental Papilla**

No technique can predictably restore a lost interdental papilla (Blatz et al. 1999; Kaushik et al. 2014). The best way to restore a papilla is not to lose it in the first place.

## **FACTORS THAT AFFECT THE OUTCOME OF PERIODONTAL PLASTIC PROCEDURES**

### **Teeth Irregularity**

Abnormal tooth alignment is a major cause of gingival deformities that require corrective surgery and is a significant factor in determining the outcomes of treatment. The location of the gingival margin, the width of the attached gingiva, and the alveolar bone height and thickness are all affected by tooth alignment.

On teeth that are tilted or rotated labially, the labial bony plate is thinner and located farther apically than on the adjacent teeth. The gingiva is receded, subsequently exposing the root. On the lingual surface of such teeth, the gingiva is bulbous and the bone margins are closer to the cemento-enamel junction (Bowers 1963; Andlin-Soboki & Bodin 1993). The level of gingival attachment on root surfaces and the width of the attached gingiva following mucogingival surgery are affected as much, or more, by tooth alignments as by variations in treatment procedures.

Orthodontic correction is indicated when performing mucogingival surgery on malpositioned teeth in an attempt to widen the attached gingiva or to restore the gingiva over denuded roots. If orthodontic treatment is not feasible, the prominent tooth should be ground to within the borders of the alveolar bone, avoiding pulp injury.

Roots covered with thin bony plates present a hazard in mucogingival surgery. Even the simplest type of flap (partial thickness) creates the risk of bone resorption on the periosteal surface (Hangorsky & Bissada 1980). Resorption in amounts that generally are not significant may cause loss of bone height when the bony plate is thin or tapered at the crest.

### **Mental Nerve**

The mental nerve emerges from the mental foramen, most commonly apical to the first and second mandibular premolars, and usually divides into three branches. One branch turns forward and downward to the skin of the chin. The other two branches travel forward and upward to supply the skin and mucous membrane of the lower lip and the mucosa of the labial alveolar surface.

Trauma to the mental nerve can produce uncomfortable paresthesia of the lower lip, from which recovery is slow. Familiarity with the location and appearance of the mental nerve reduces the likelihood of injuring it.

### **Muscle Attachments**

Tension from high muscle attachments interferes with mucogingival surgery by causing postoperative reduction in vestibular depth and width of the attached gingiva.

### **Mucogingival Junction**

Ordinarily, the mucogingival line in the incisor and canine area is located approximately 3 mm apically to the crest of the alveolar bone on the radicular surfaces and 5 mm interdentally (Strahan 1963). In periodontal disease and on malpositioned, disease-free teeth, the bone margin is located farther apically and may extend beyond the mucogingival line.

The distance between the mucogingival line and the cemento-enamel junction before and after periodontal surgery is not necessarily constant. After inflammation is eliminated, there is a tendency for the tissue to contract and draw the mucogingival line in the direction of the crown (Donnenfeld & Glickman 1966).

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