



**Dental Clinical Practice 4A**

**Periodontal Assessment and Management  
in Fixed Prosthodontics Part 2**

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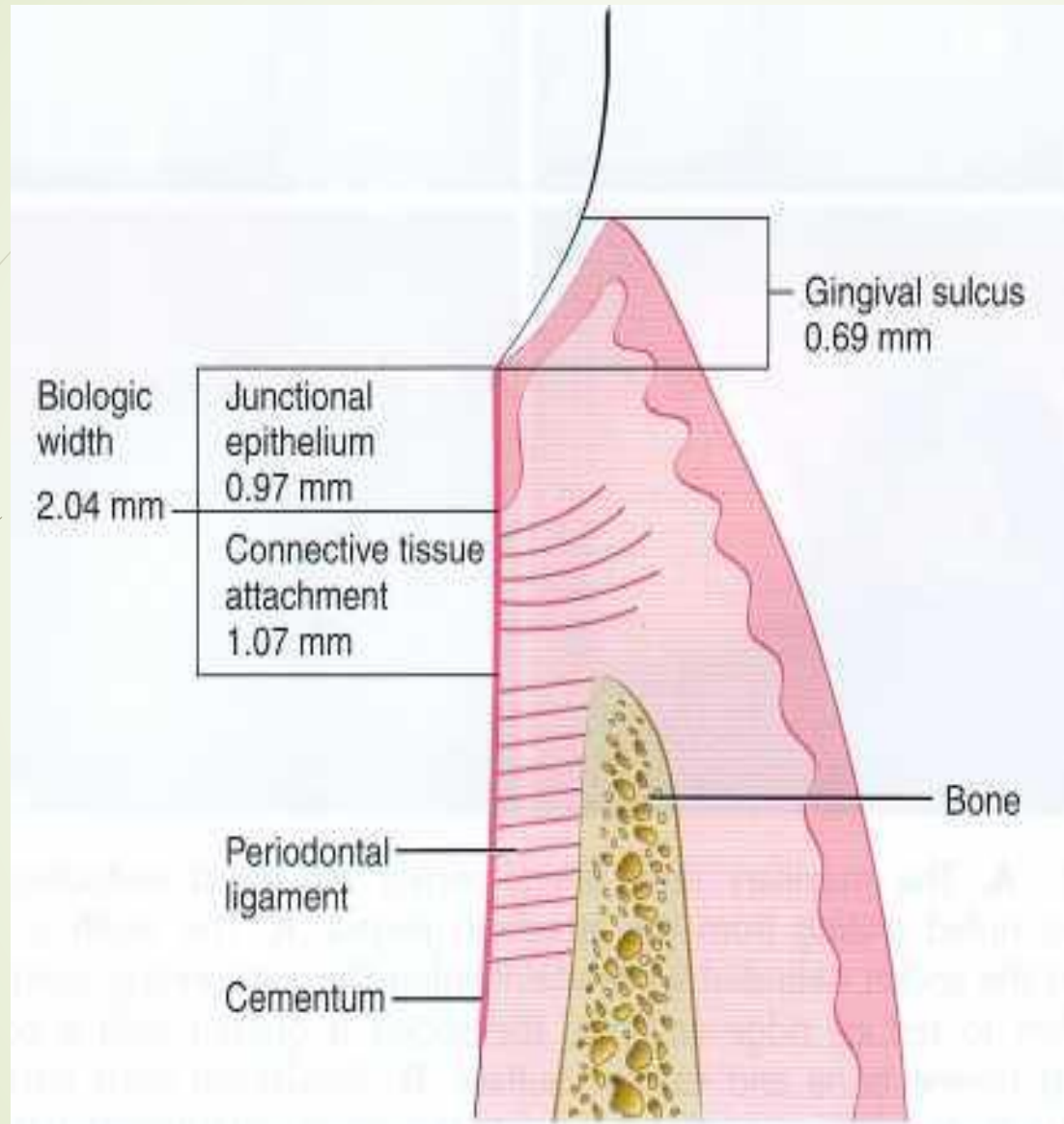


# Biologic considerations:

## Margin Placement and Biologic Width

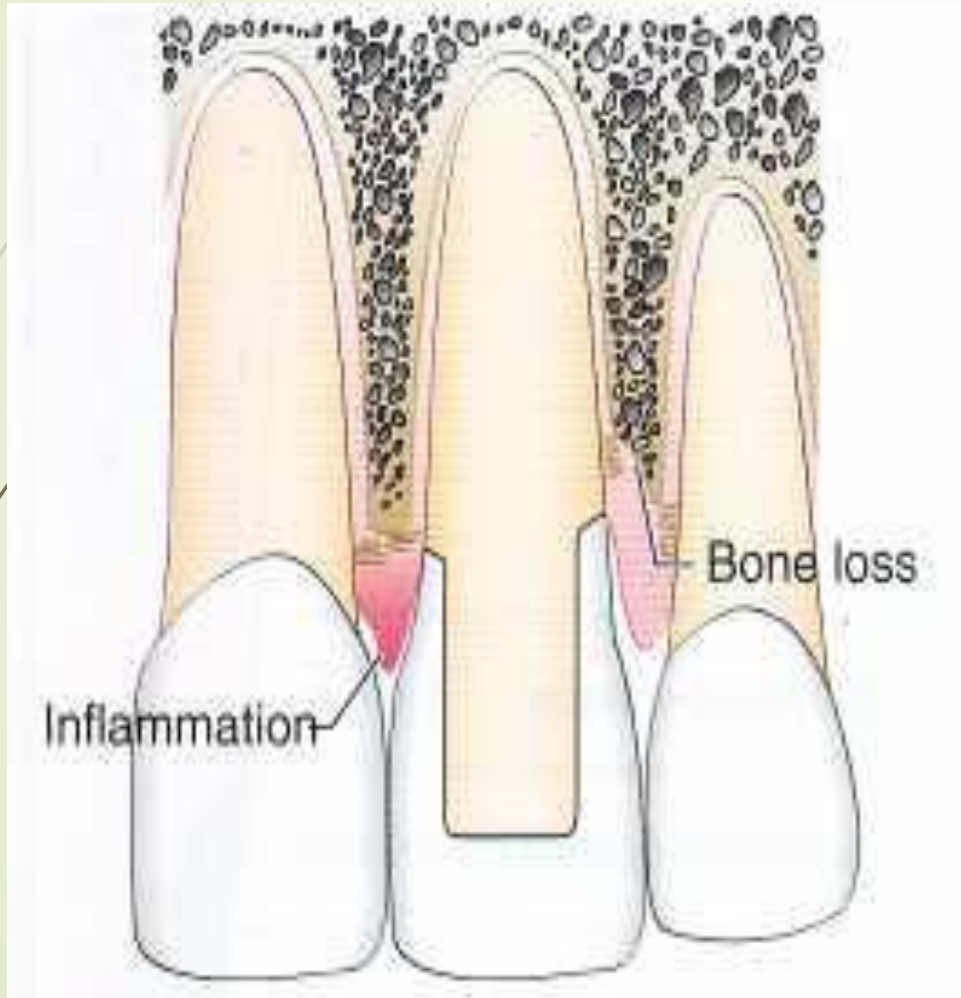
- The **biologic width** is defined as the physiologic dimension of the junctional epithelium and connective tissue attachment. It is relatively constant at approximately 2 mm.
- The healthy gingival sulcus depth is 0.69 mm





**Biologic Width**





Biologic width violation occurs if a restorative margin is placed within the zone of the attachment.

- On the mesial surface of the left central incisor, bone has not been lost, but gingival inflammation occurs.
- On the distal surface of the left central incisor, bone loss has occurred, and a normal biologic width has been reestablished.



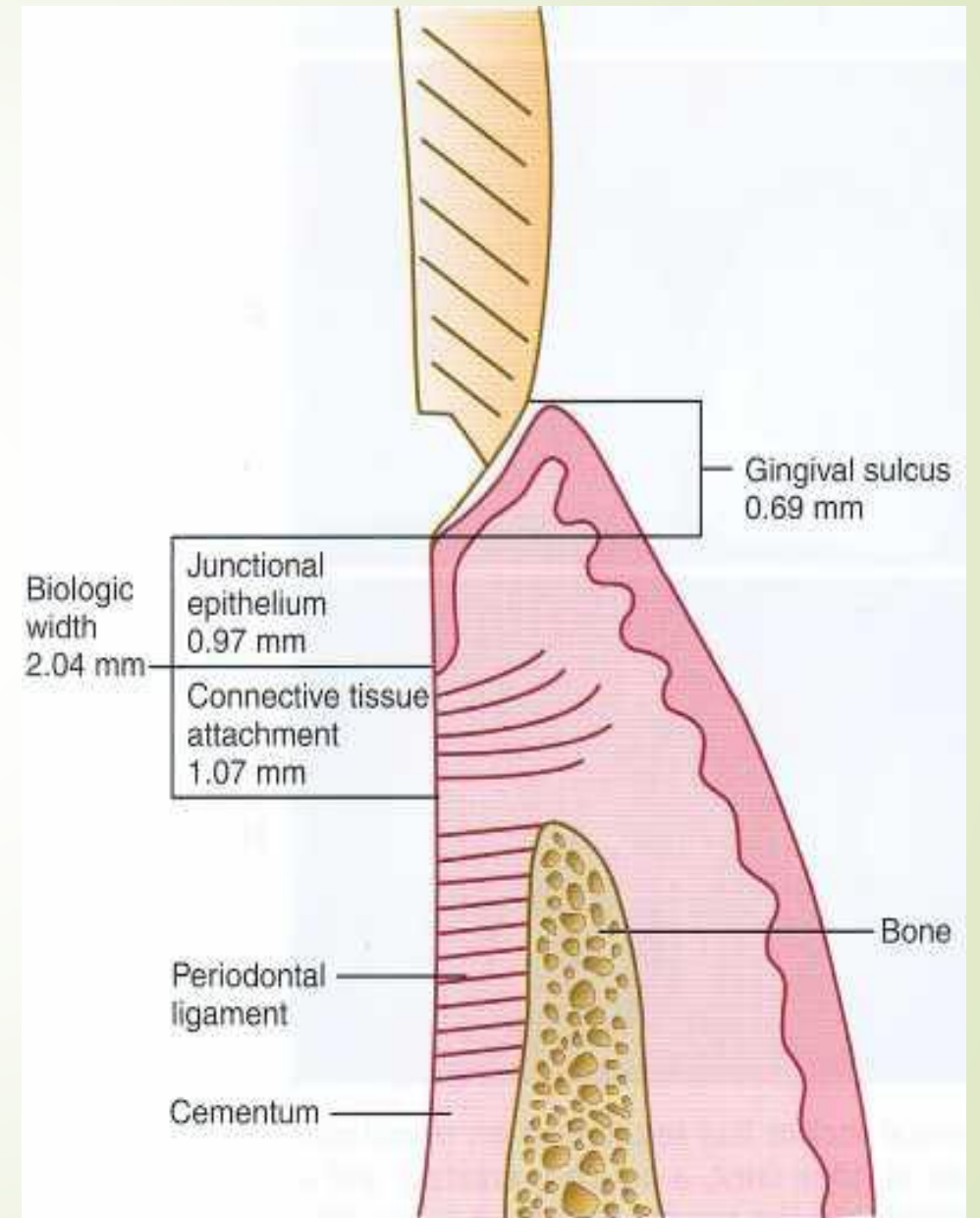
Infringement on the biologic width by the placement of a restoration within its zone may result in

- gingival inflammation,
- pocket formation,
- alveolar bone loss





There is at least 3.0mm distance between the gingival margin and bone crest.  
Placement of the restorative margin 0.5 mm into the sulcus allows for the maintenance of the biologic width.



# Options for margin placement:

1. Supragingival
2. Equigingival (even with the tissue)
3. Subgingival

➤ The supragingival margin has the least impact on the periodontium. Classically, this margin location has been applied in unesthetic areas because of the marked contrast in color and opacity of traditional restorative materials against the tooth. With the advent of more translucent restorative materials, adhesive dentistry, and resin cements, the ability to place supragingival margins in esthetic areas is now a reality. Therefore, whenever possible, these restorations should be chosen not only for their esthetic advantages but also for their favorable periodontal impact.



# Options for margin placement:

- The use of *equigingival margins* traditionally was not desirable because they were thought to retain more plaque than supragingival or subgingival margins and therefore result in greater gingival inflammation. There was also the concern that any minor gingival recession would create an unsightly margin display. These concerns are not valid today because 1. the restoration margins can be esthetically blended with the tooth, 2. restorations can be finished easily to provide a smooth, polished interface at the gingival margin. From a periodontal viewpoint, both supragingival and equigingival margins are well tolerated.









With the advent of adhesive dentistry and ultrathin ceramic veneers, it is possible to prepare restorations equigingival without visible margins. The preparations for six porcelain veneers with the margins placed at the level of tissue are shown.



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- The greatest biologic risk occurs when placing *subgingival margins*. These margins are not as accessible as supragingival or equigingival margins for *finishing procedures*. In addition, if the margin is placed too far below the gingival tissue crest, *it violates the gingival attachment apparatus (biologic width)*.



# Intracrevicular(subgingival) margin placement in esthetic area

- **Rule 1:** If the sulcus probes 1.5 mm or less, place the restoration margin 0.5 mm below the gingival margin. This is especially important on the facial aspect and will prevent a biologic width violation in a patient who is at high risk in that regard.
- **Rule 2:** If the sulcus probes more than 1.5 mm, place the margin half the depth of the sulcus below the gingival margin. This places the margin far enough below tissue so that it will still be covered if the patient is at higher risk of recession.
- **Rule 3:** If a sulcus greater than 2 mm is found, especially on the facial aspect of the tooth, evaluate to see if a gingivectomy could be performed to lengthen the teeth and create a 1.5-mm sulcus. Then the patient can be treated using Rule 1.







A 78-year-old woman presents with the maxillary anterior restorations placed 6 months earlier. She is unhappy with the exposed margins and notes that the margins were covered the day the restorations were placed.



Depth from the attachment to the level of the preparation margin is greater than 3 mm. This patient had a sulcus depth of more than 3 mm when these restorations were placed.





treatment options were:

(1) place the original margins to half the depth of the sulcus, in which case the recession that occurred would not have exposed them, or

(2) perform a gingivectomy, creating a 1-mm to 1.5-mm sulcus. The second option was chosen when the restorations were redone. The margins were then placed 0.5 mm below the tissue after the gingivectomy.



At 6 weeks after the gingivectomy and preparation of the teeth. Note the tissue level and that the tissue is rebounding coronally over the margins. This is a common finding when a gingivectomy is done.







Four-year recall photograph after placement of the final restorations for patient . Note the tissue level has been maintained, with a sulcus depth of 2 mm on the facial surface.

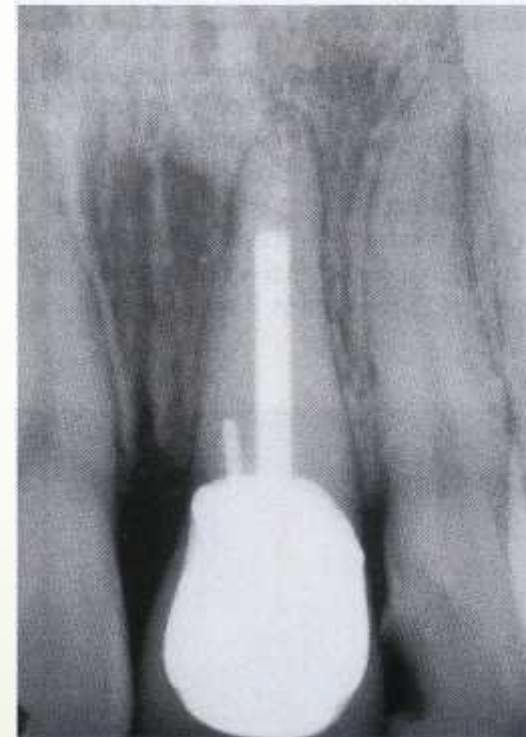


# Orthodontic extrusion

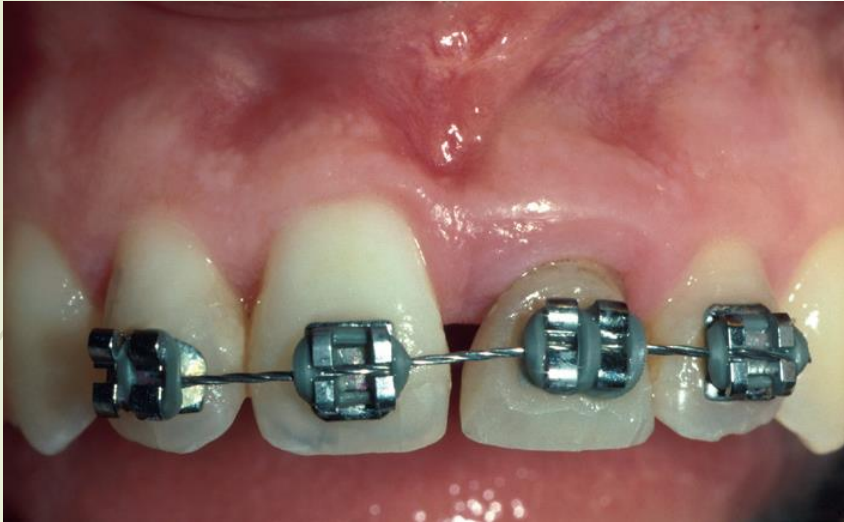


The left central incisor was fractured in an accident 12 months ago and restored at that time. The patient is unhappy with the appearance of the tissue surrounding the restoration.

Radiograph reveals a biologic width violation on the mesial surface interproximally. Removal of interproximal bone would create an esthetic deformity. This patient is better treated with orthodontic extrusion.



# Orthodontic extrusion



After orthodontic eruption. The tooth has been erupted 3 mm to move the bone and gingiva coronally 3 mm on the left central incisor. It is now possible to reposition the bone surgically to the correct level and position the gingiva to the correct level, reestablishing normal biologic width.



One-year recall photograph after orthodontic extrusion, osseous surgery, and placement of a new restoration . Note the excellent tissue health after the reestablishment of biologic width.



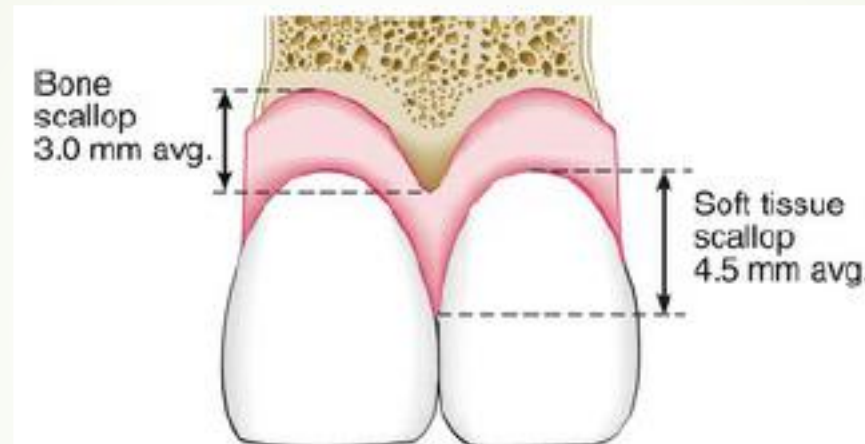


# Managing Interproximal Embrasures

- Interproximal papilla is an important part in creating aesthetic result.
- The interproximal embrasure created by restorations and the form of the interdental papilla have a unique and intimate relationship



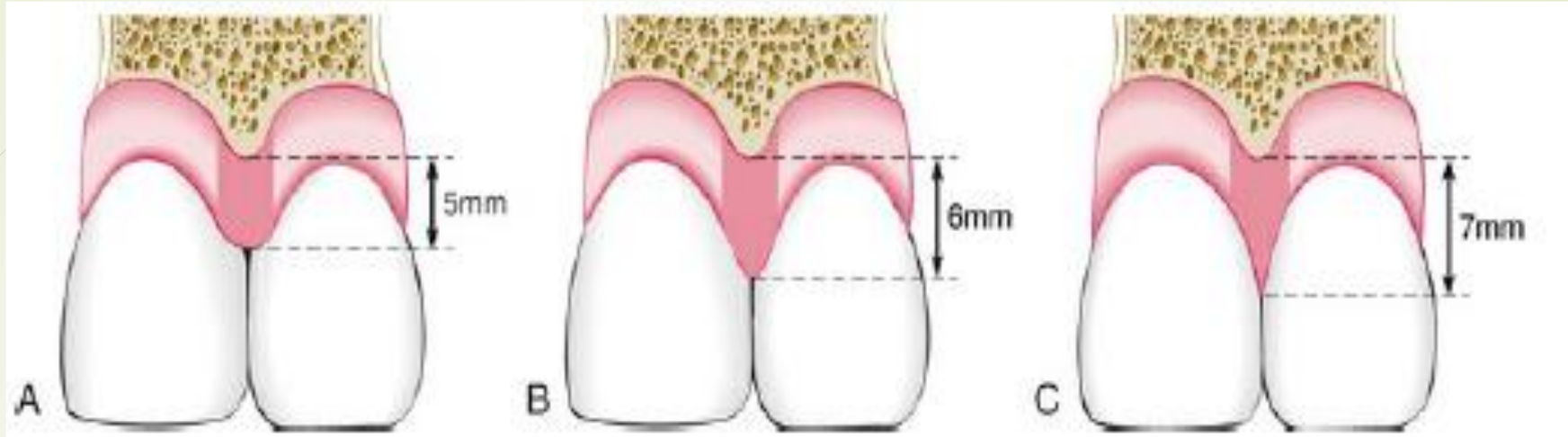
## Managing Interproximal Embrasures



- Papillary height is established by the level of the bone, the biologic width, and the form of the gingival embrasure. The free gingival margin averages 3 mm above the underlying facial bone, the tip of the papilla averages 4.5 to 5 mm above the interproximal bone



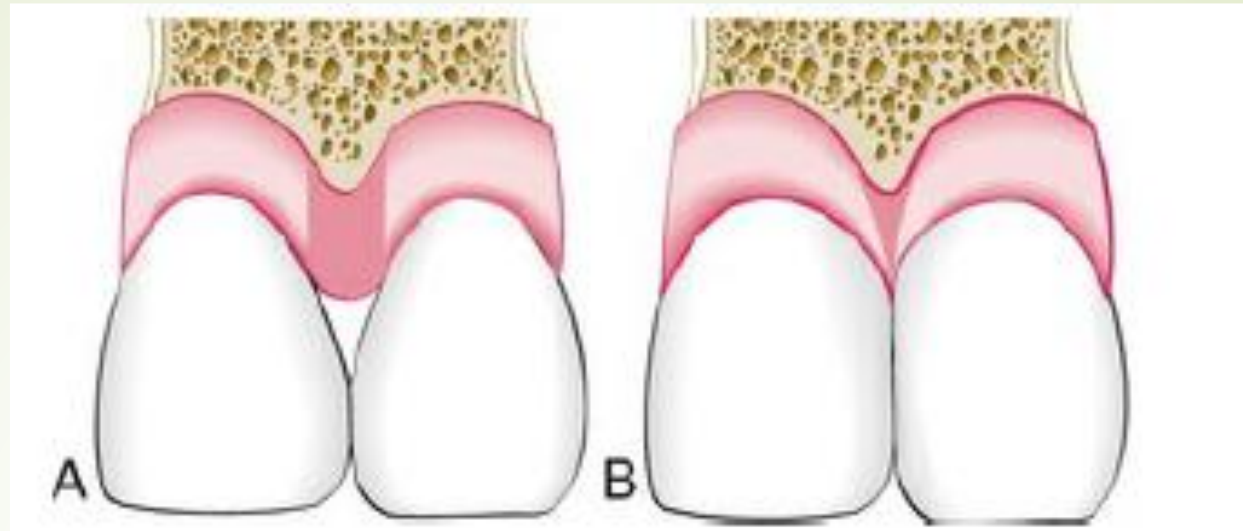




The probability of complete fill of gingival embrasure by papilla.

- (A) With 5 mm from crest of bone to the apical contact point, there is a 98% chance of complete fill of the space.
- (B) At 6 mm from crest to contact, the chance of filled embrasure drops to 56%.
- (C) At 7 mm from crest to contact, the chance of complete fill drops to 27%.





Relationship between gingival embrasure volume and papillary form.

(A) Gingival embrasure of the teeth is large as the result of a tapered tooth form. Because of this, the volume of tissue sitting on top of the attachment has a blunted form and a shallower sulcus.

(B) the same volume of tissue sits on top of the attachment as in part A. Because of the more closed embrasure form, papilla completely fills the embrasure.



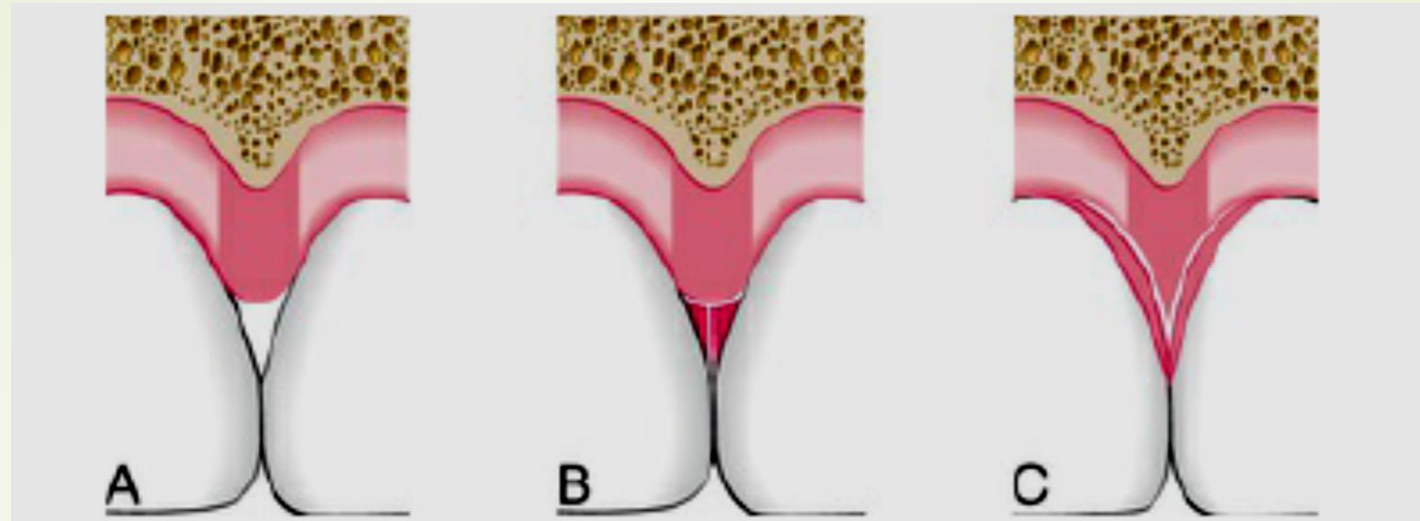


## Clinical Correlation

- If you create restorations with no more than 5 mm from the contact to the bone, open gingival embrasures can be avoided. The downside to this approach is that the teeth will look square and blocky. However, some patients can support a 7-mm papilla. Well made provisional restorations allow accurate determination of actual papilla length.



# Correcting Open Gingival Embrasures Restoratively



➤ Methods of altering gingival embrasure form.

(A) Typical open gingival embrasure caused by excessively tapered tooth form.

(B) Common method employed by restorative dentists to correct the embrasure: material is added supragingivally but results in overhangs that cannot be cleaned using dental floss.

(C) Correct method of closing the gingival embrasure: the margins of the restoration are carried 1 to 1.5 mm below the tip of the papilla. This allows easy cleaning because of the convex profile. It also reshapes the papilla to a more pleasing profile aesthetically.











# Gingival Management during Crown and Bridge Procedures

## Requirements For Healthy Gingiva Around Restorations

- Correctly prepared margins
- Gingival protection during preparation procedures
- Impression material to reach critical areas
- Well-fitting temporary crowns!
- Well-finished restoration margins
- Moisture control for impressions and cementation
- Correctly prepared contour of restorations





# Gingival Recontouring

## INDICATIONS

- Aesthetics – harmonious gingival contour
- Elimination of deep pockets, improve access for crown margins
- Crown lengthening

## METHODS

- Mechanical (Surgical) – gingivoplasty, apically or coronally repositioned flap
- Mechanical – rotary diamonds
- Electrosurgery





# Tissue Management and Control of Bleeding

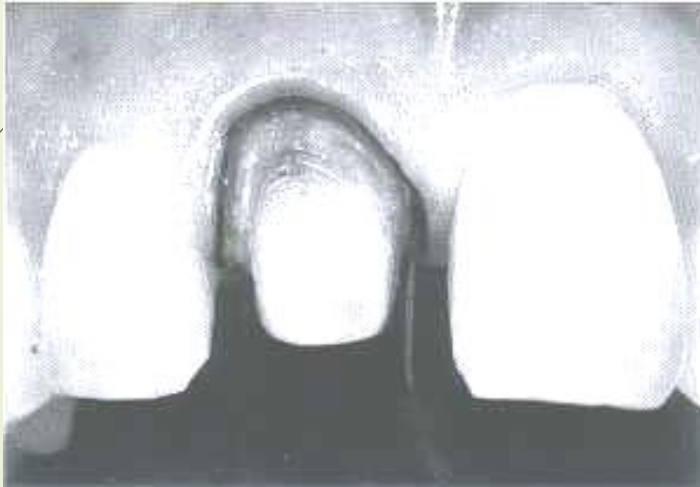
- **Gingival retraction – cord and astringents**
- **Electrosurgery**



# Dental Applications of ES

- Crown lengthening
- Gingival recontouring
- Excision of hyperplastic gingival tissues caused by:
  - Large open carious lesion
  - Lost filling
  - Fractured tooth
  - Poor fitting RPD or Bridge
- Hemostasis
- Exposing of tooth margins (removal of proliferated gingiva over the preparation finish line)

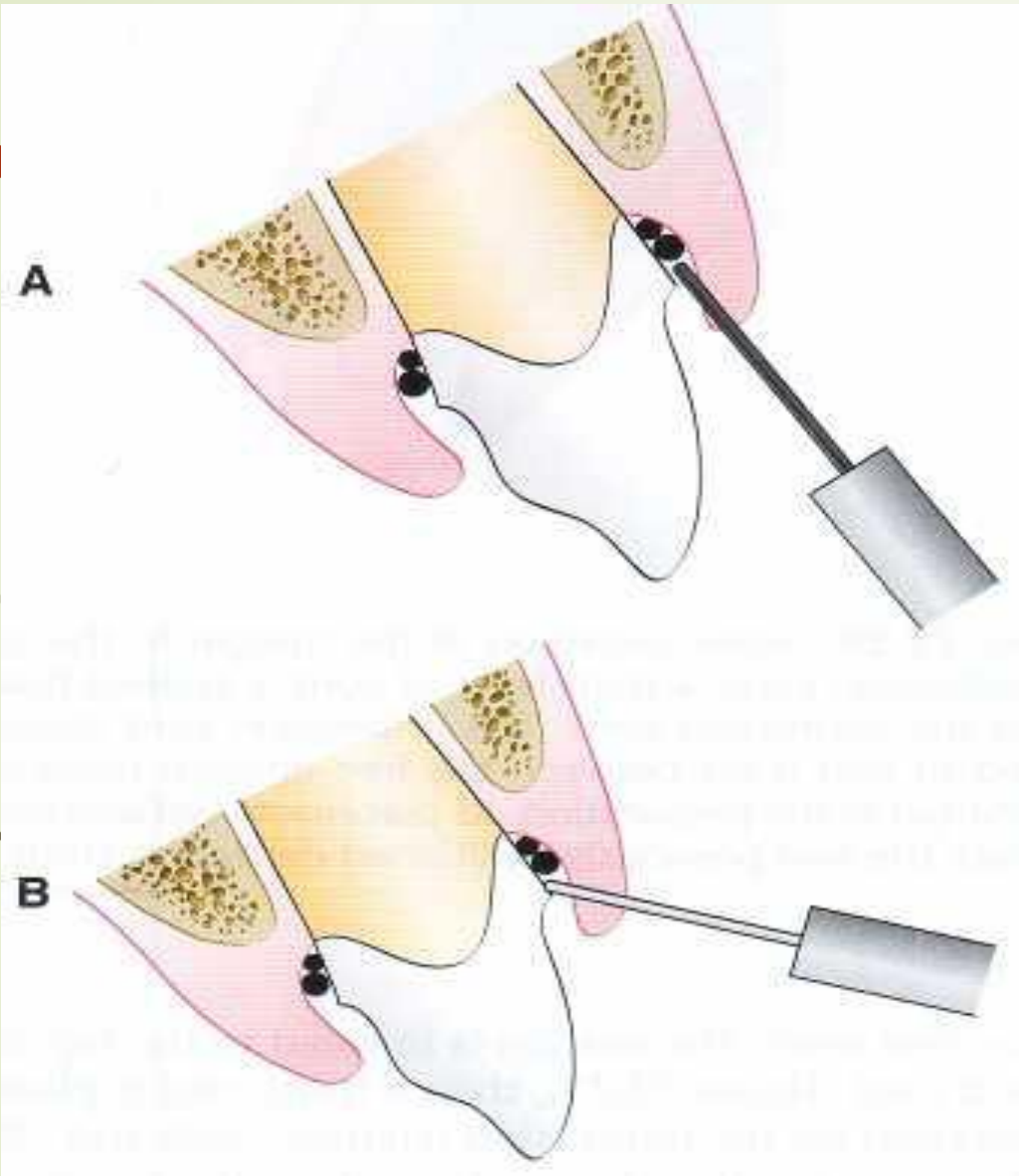




- Using electrosurgery, the fine-wire electrode tip is held parallel to the tooth preparation and rests on the cord as the tip is moved around the tooth





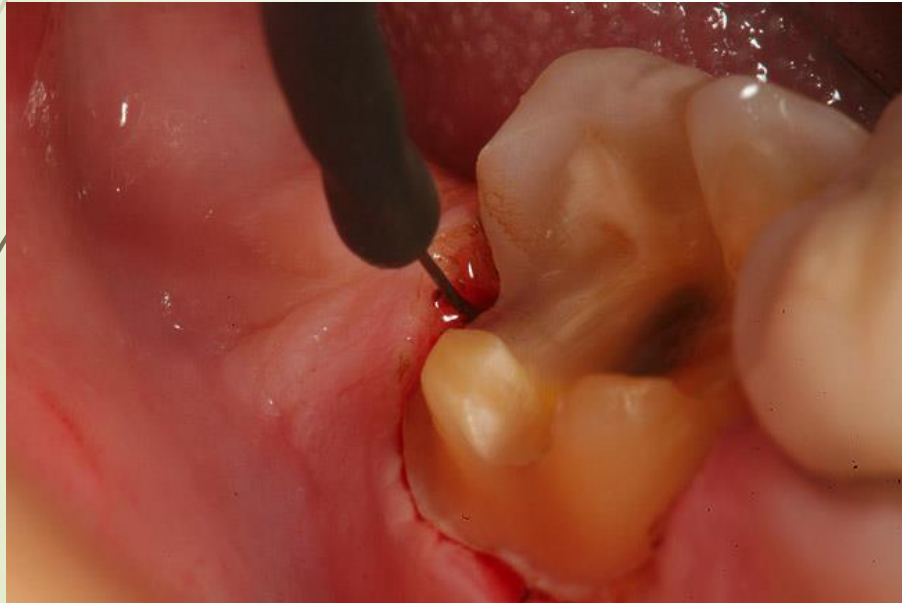


If it is necessary to use electro surgery, the correct inclination of the electro surgery tip is important.

**A**, Electro surgery tip being held parallel to the preparation and resting on the previously placed retraction cord. This removes a minimal amount of tissue, and the presence of the retraction cord protects the attachment from the electro surgery.

**B**, Incorrect inclination of electro surgery tip. The tip is leaning away from the preparation. This inclination results in excess tissue removal









# Trauma to Periodontal Tissues 1.

## Crown Preparation and Impressions

- From burs
- Deep crown margins
- Abrasion from dry retraction cord
- Overly large retraction cord
- Retraction cord left in gingival crevice too long
- Impression material retained in gingival crevice
- Chemical burn from low pH astringents

## Consequences

- Gingival recession
- Deepening of periodontal pocket
- New 'biologic width'
- Chronic gingivitis





# Trauma to Periodontal Tissues 2.

## Temporization

- Poor surface finish for temporary restorations
- Open proximal contacts
- Margin overhangs and deficiencies
- Insufficient embrasure space

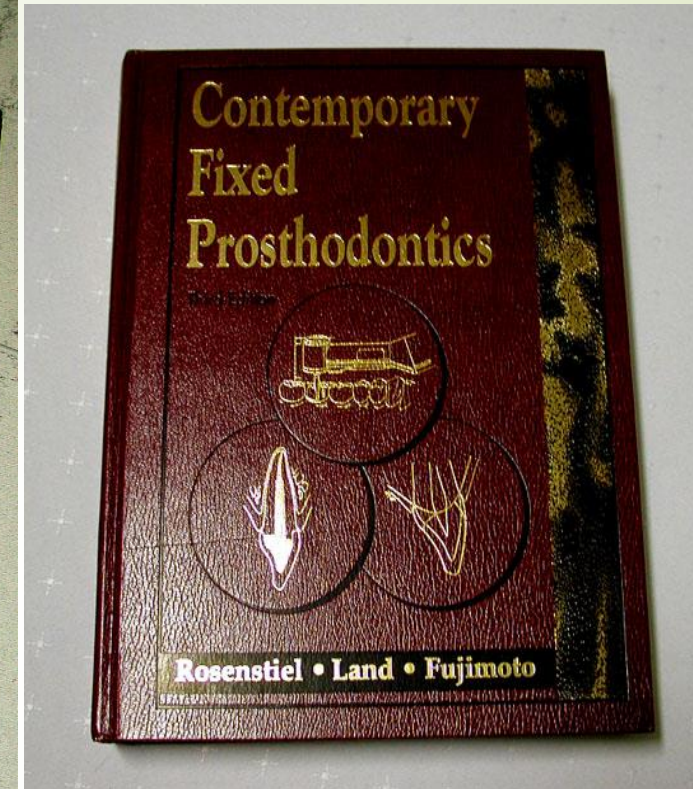
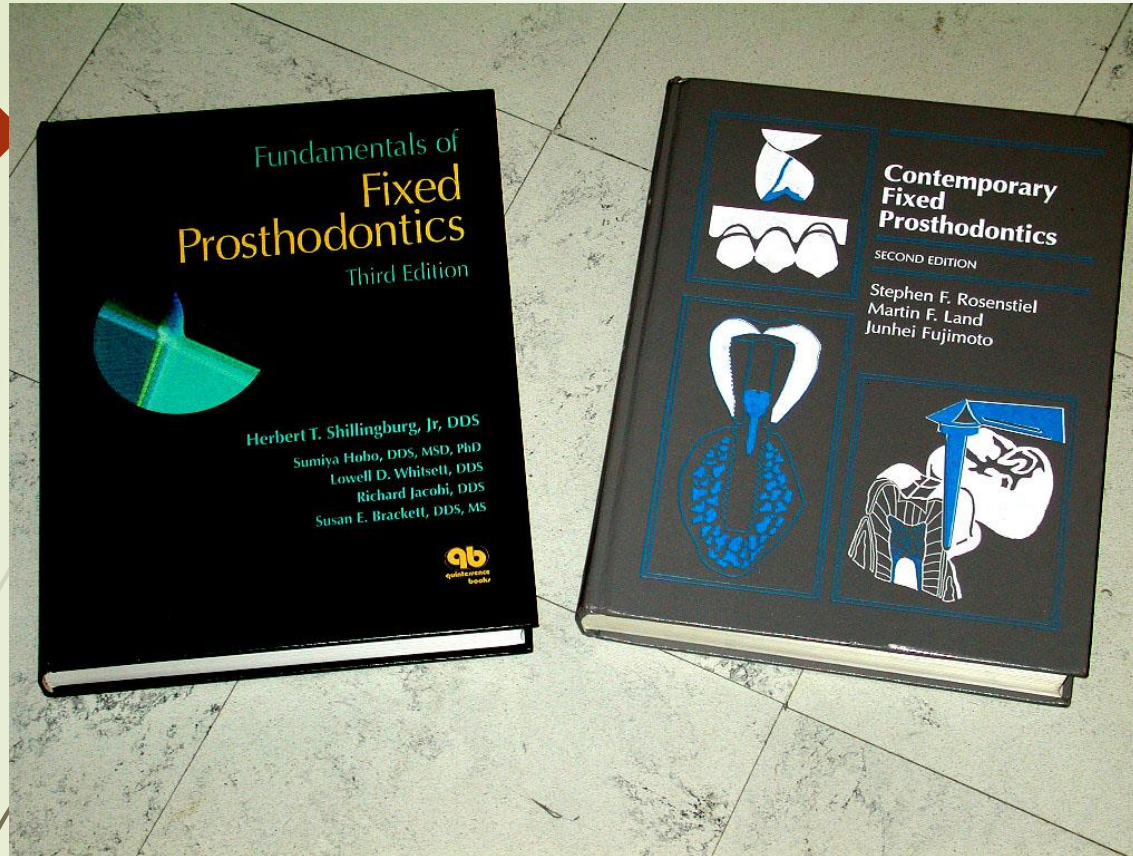
## Consequences

- Trapping gingiva under crown margin
- Gingival inflammation, recession/ exposure of margins or overgrowth

## Electro surgery

- Heating alveolar bone leading to infection/sequestration





Carranza's Clinical Periodontology 13 th  
edition(chapters 69 & 70 )

