

# **Surgical versus nonsurgical periodontal therapy**

## **Lecture 1 – AUDIO**

Dr Sushil Kaur  
Dr Betul Rahman



# Treatment modalities in periodontics

- Scale and clean therapy (closed therapy)
- Surgery (open therapy)
- Combination of scaling and cleaning followed by surgery

# Objectives of non-surgical therapy

- The effective removal of plaque and calculus from all supragingival and subgingival surfaces with minimal trauma to existing tooth surfaces (dentine and enamel), correction of defective restorations
- Determination of correct time intervals between supportive periodontal therapy
- Motivation of patients to retain oral hygiene at healthy level particular to each patient

# Instruments

- **Scalers** - supragingival plaque/calculus removal
- **Curettes** - supra/subgingival plaque/calculus removal
- **Ultrasonic devices** - supra/subgingival plaque/calculus removal
- **OH devices** ie tooth brushes, floss, flossettes, interproximal brushes, tooth picks
- **Mouthwashes/topical antiseptics?**

# Hand instruments vs U/S?

- **Hand instruments**

- Advantages: better tactile sense, in experienced hands can remove calculus more thoroughly than US.
- Disadvantages: decreased efficiency in inexperienced hands, can damage/remove tooth structure easily, damage soft tissues

- **Ultrasonics**

- Advantages: ease of use even in inexperienced hands, lavage, cellular disruption and increase access to difficult areas (grooves, furcas and distal of molars)
- Disadvantages: decreased sensitivity, can cause damage to tooth structure, patient discomfort

## Scaling and Root Planing (root debridement)

- The beneficial effects of scaling and root debridement combined with personal plaque control in the treatment of chronic periodontitis have been validated. These include:
  - reduction of clinical inflammation,
  - microbial shifts to a less pathogenic subgingival flora,
  - decreased probing depth,
  - gain of clinical attachment
  - less disease progression

**Scaling and root debridement procedures are technically demanding and time-consuming.**

# Periodontal healing after Scaling and Root Planing therapy

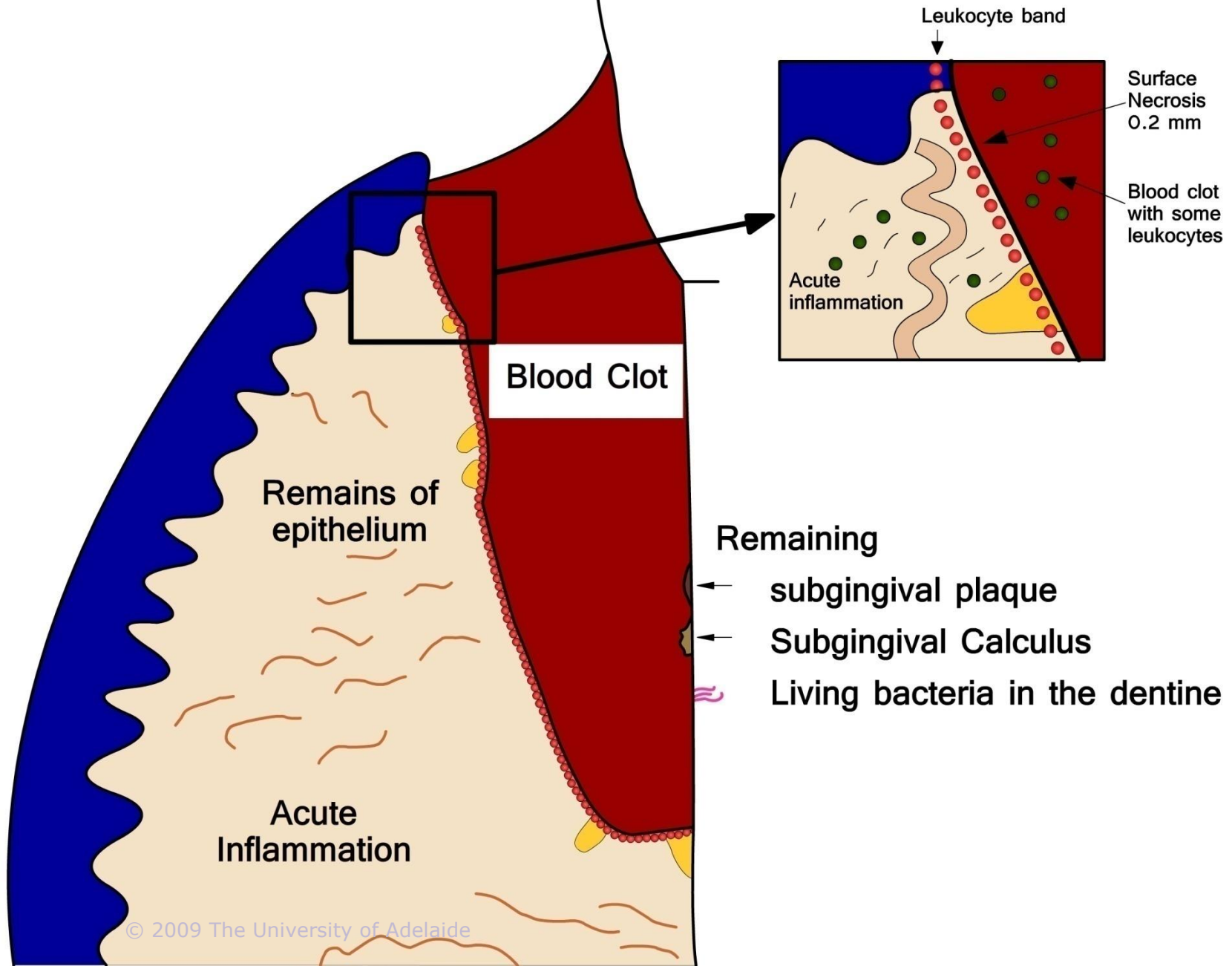
- Immediately following non-surgical treatment, the pocket epithelium as well as most of the remaining junctional epithelium have been unintentionally removed.
- Part of the connective tissue lateral to the dentogingival epithelium is also curetted away. These effects are similar for both the hand and machine driven scaling instruments.
- Strands of epithelium may remain in certain areas of the connective tissue surface.

# Periodontal healing after Scaling and Root Planing therapy

- The treatment thus results in that a connective tissue wound created lateral to the tooth.
- On the surface of the necrotic zone layer of leukocytes accumulate. These cells provide a protection against bacterial attack and also mediated some of the healing events.



## 2-8 hours following scaling and rootplanning



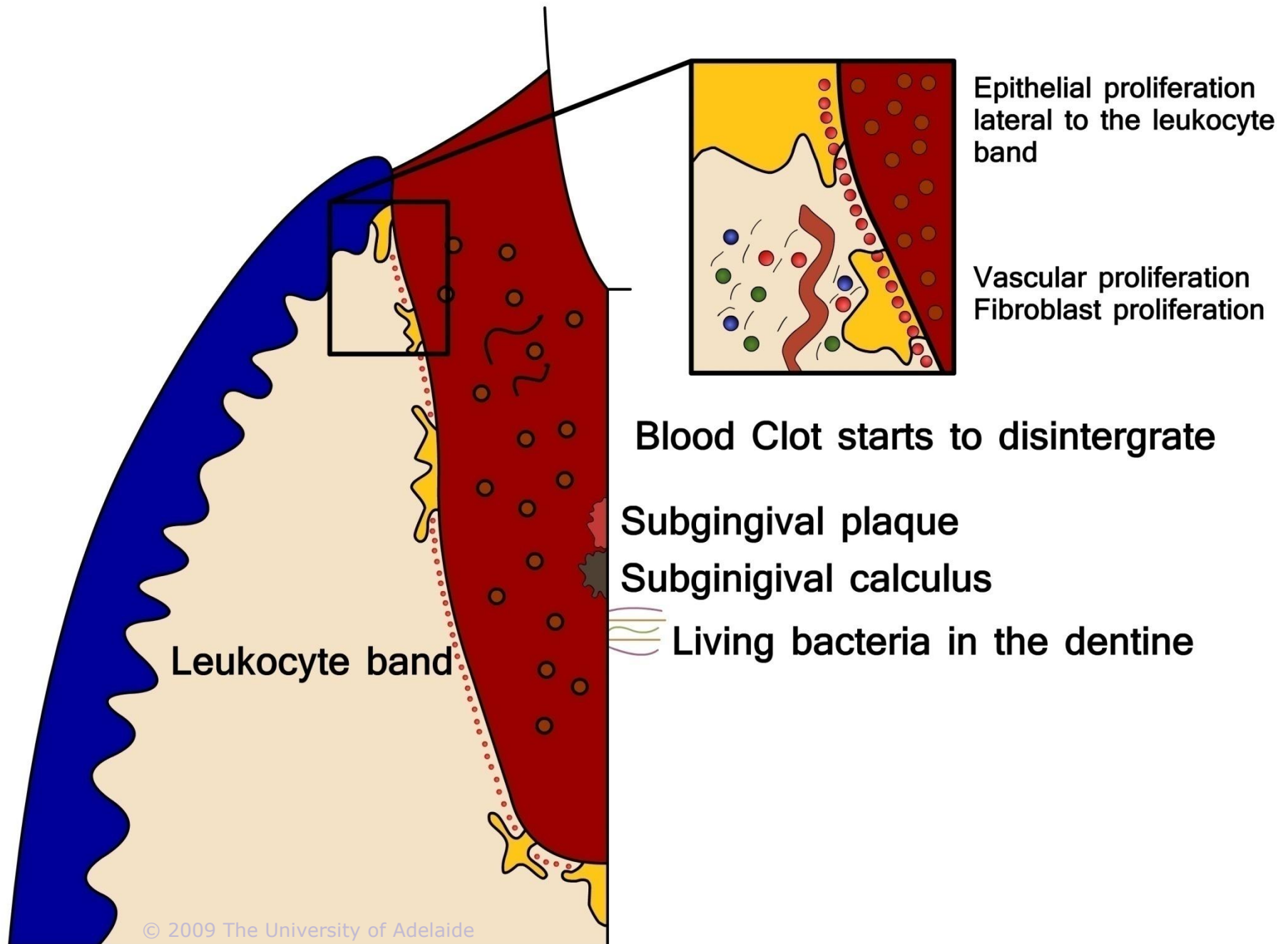
# Periodontal healing after Scaling and Root Planing therapy

- Soon after wounding, the epithelium starts to proliferate to cover the connective tissue. The proliferation takes places from the gingival margin and from surviving strands of epithelium on the wound surface.
- Current studies have documented that islands of calculus and subgingival plaque may remain on the root surface following even careful subgingival scaling and root-planing. Also bacteria may have invaded dentinal tubuli.

# Periodontal healing after Scaling and Root Planing therapy

- Between 8-24 hours post treatment, dramatic changes take place in:
  - **the connective tissue**
  - **the remaining epithelium**
  - **the blood clot between the tooth surface and the soft tissue**
- Mediators for inflammation are released, cell proliferation is initiated and  
the blood clot starts to disintegrate.

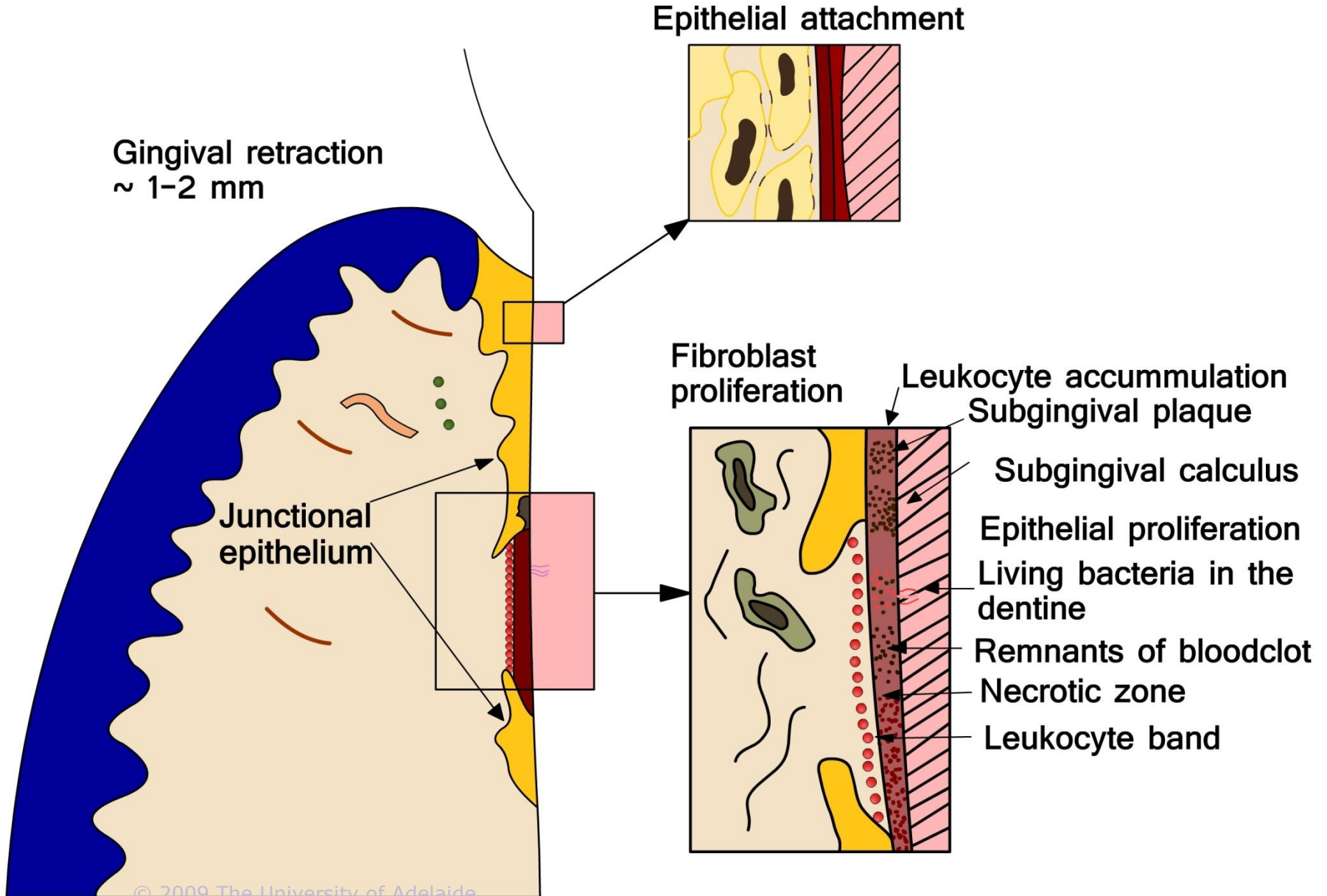
## 8 - 24 hours post scaling and root planing



# Periodontal healing after Scaling and Root Planing therapy

- After about 7 days most of the connective tissue is covered with epithelium and a new epithelial attachment has formed against the tooth surface. In uncovered areas the leukocytes constitute the barrier towards the environment of the subgingival space.

## 7 days after scaling and rootplanning





# Periodontal healing after Scaling and Root Planing therapy

- The initial healing is rapid while the maturation of the tissue takes time and remodelling processes may occur months after treatment.
- Following successful non-surgical periodontal treatment demonstrates gains of 1 to 2 mm in PD. (PD reduces 1-2 mm)
- This does not mean that new connective tissue attachment has formed but is a reflection of the increased tonus of the gingival tissues preventing the apical placement of the measuring probe.

# Periodontal healing after Scaling and Root Planing therapy

- Probing pocket depths may show decrease of up to 2- 4 mm due recession.
- The treatment result following non-surgical periodontal therapy is stable over time in most patients if the patient cooperate and the oral health team provide supportive treatments according to need.



# Periodontal maintenance procedures

- Periodic monitoring of periodontal status and appropriate maintenance procedures should be part of the long-term treatment plan for managing chronic periodontitis.
- Although experimental studies have demonstrated very successful treatment outcomes when patients are professionally maintained at 2-week intervals, such a program is impractical for most chronic periodontitis patients. Therefore, to maximize successful therapeutic outcomes, patients must maintain effective daily plaque control.
- It also appears that in-office periodontal maintenance at 3 to 4 month intervals can be effective in maintaining most patients.

# Detection of residual calculus

- The response to treatment will depend on the absolute removal of calculus and plaque
- To achieve this, detection of subgingival calculus is required
- However, the ability to detect the presence of subgingival calculus is low
- Sherman (1990) showed that 77.4% of the surfaces with microscopic calculus were clinically scored as being free of calculus and 11.8% of the surfaces microscopically free of calculus were clinically determined to have calculus

# Ability to Scale and Clean root surfaces relating to pocket depth

- The purpose of a study by Caffesse *et al* (1986) was to evaluate the effectiveness of scaling only (SO) and scaling with a flap (SF) relative to pocket depth.
- Each of 21 patients who required multiple extractions had 2 teeth scaled, 2 teeth scaled following the reflection of a periodontal flap, and 2 teeth serve as controls. Local anesthesia was used.
- Following extraction, the % of subgingival tooth surfaces free of calculus was determined using a stereomicroscope.

# Ability to S/C root surfaces relating to pocket depth

- While scaling only (SO) and scaling with a flap (SF) increased the % of root surface without calculus, scaling following the reflection of a flap aided calculus removal in pockets **4mm and deeper**.
- Comparison of SO versus SF at various pocket depths for % of tooth surfaces completely free of calculus showed:
  - **1 to 3 mm pockets to be 86% versus 86%,**
  - **4 to 6 mm pockets to be 43% versus 76%**
  - **Greater than 6 mm pockets to be 32% versus 50%.**
- The extent of residual calculus was directly related to pocket depth, was greater following scaling only, and was greatest at the CEJ or in association with grooves, fossae or furcations.

# Residual calculus

- The persistence of calculus on root surfaces is detrimental to the health of that particular site, particularly in a subset of patients (susceptible)
- This subset of individuals respond to plaque in an adverse way. This makes the removal of plaque and calculus imperative in these individuals



If closed therapy (S/C)  
prevented bone or tooth loss  
**100%** of the time then  
periodontal surgery would  
not exist

# Periodontal Surgery



# Purpose and Goals of Surgical Therapy

- Periodontal surgery, its goals and purposes, can only be considered in conjunction with complete periodontal treatment eg. initial therapy and surgery are two entities with identical goals, but which use different methods (closed SRD *versus* SRD with direct vision) to achieve these goals.
- Furthermore, initial therapy may be the only therapy required for mild periodontitis, whereas in severe cases it may represent only a preparatory presurgical phase.



# Purpose and Goals of Surgical Therapy

- **1. Subgingival root debridement with direct vision**
- **2. Reduction or elimination of plaque retentive areas**
- **3. Elimination of inflammation and pocket activity**
- **4. Enhancing regeneration of periodontal tissues**
- **5. Creation of physiologic morphology of marginal periodontium and mucogingival border**

# 1. Subgingival root debridement with direct vision

- The root surface is exposed to clinical view either by reflecting mucoperiosteal flaps or by simple gingivectomy.
- The root surface inc. its depressions, irregularities and the furcation area, is then debrided of plaque and calculus which was not accomplished completely during initial therapy.
- Endotoxin-containing cementum is planed away and the root surface is smoothed. These measures make possible, the healing and regeneration of periodontal structures.

## 2. Reduction or elimination of plaque retentive areas

- The most important retentive areas for microbial flora are periodontal pockets.
- Additional niches include open furcations, root depressions, anomalies of tooth position and iatrogenic irritants such as poor margins on restorations and crowns.
- Pockets with persistent signs of activity may be treated by various flap procedures or gingivectomy.
- Furcations can be treated by odontoplasty and rendered accessible for OH, alternatively root resection may be performed to eliminate the furcation problem entirely.

### 3. Elimination of inflammation and pocket activity

- The primary goal of periodontal surgery does not always include total elimination of the pocket itself, but elimination of any signs of pocket *activity* (infection) such as exudates, hemorrhage or suppuration.
- The goal is to halt the progression of the disease process.
- Elimination of inflammation *always* leads to tissue shrinkage, reduction of PD, and exposure of the cervical area.

## 4. Enhancing regeneration of periodontal tissues

- The result of all periodontal surgery should be healing and regeneration.
- Early results with 'guided tissue regeneration' are promising and may make it possible to avoid resective surgery.

## 5. Creation of physiologic morphology of marginal periodontium and mucogingival border

- A physiologic contour of the marginal periodontium can be achieved by means of gingivectomy/gingivoplasty, flap surgery with internal gingivectomy and (infrequently) minor osteoplasty.
- Mucogingival surgery may be employed to enhance the width of attached gingiva or to correct unphysiologic frenum attachments that extend into the marginal gingiva.
- Such procedures can stop further gingival recession.

# Types of periodontal surgery

- Resective surgery
- Access Flap Surgery
- Guided tissue regeneration
- Mucogingival surgery

# Resective surgery

- *Indications:*
  1. pocket depth reduction
  2. removal of hyperplastic tissue:  
idiopathic or induced by  
medication



# Types of resective surgery

- *Gingivectomy*: removal of pocket epithelium, connective tissue and mucosal epithelium
- *Modified Widman flap*: removal of pocket epithelium and connective tissue +/- osseous resection, leaving behind mucosal epithelium and some connective tissue

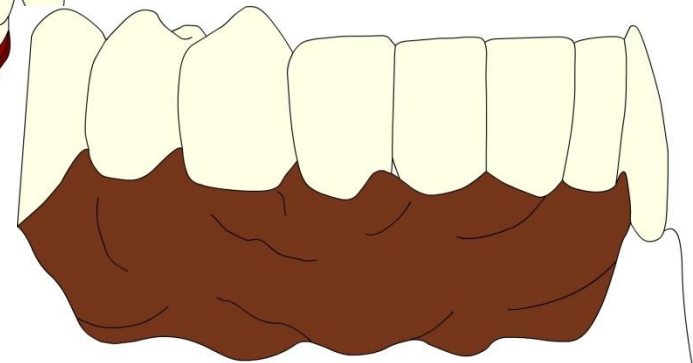
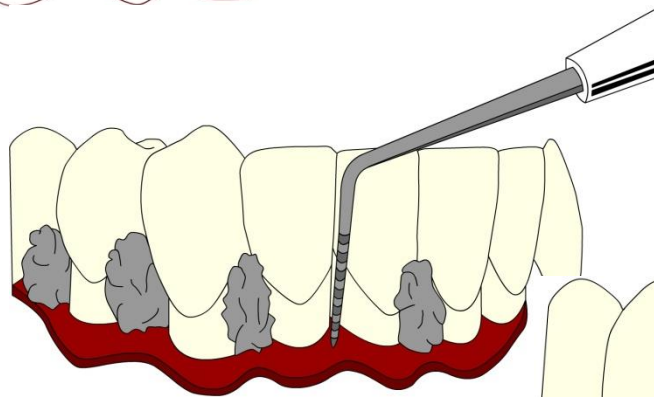
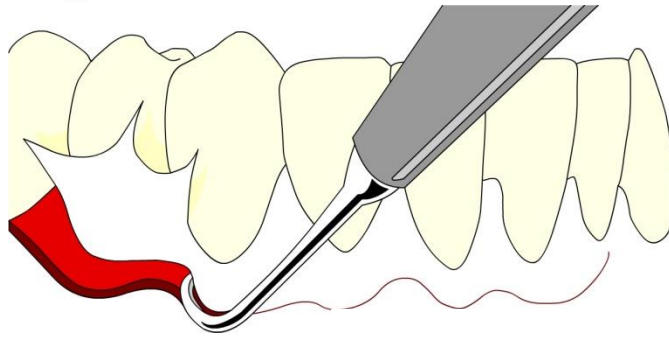
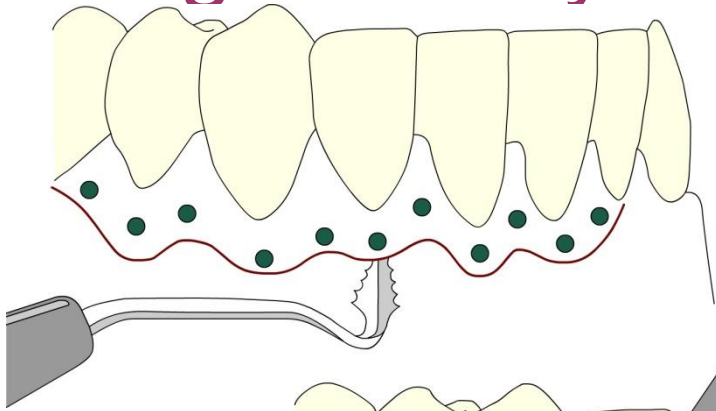
# Gingivectomy

- *Indications:* pocket depth reduction associated with horizontal bone loss and adequate width of keratinised mucosa, gingival hyperplasia
- *Contraindications:* lack of keratinised mucosa and the presence of infra-bony defects, aesthetic areas

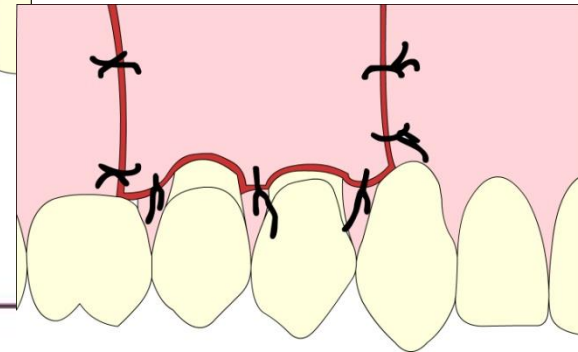
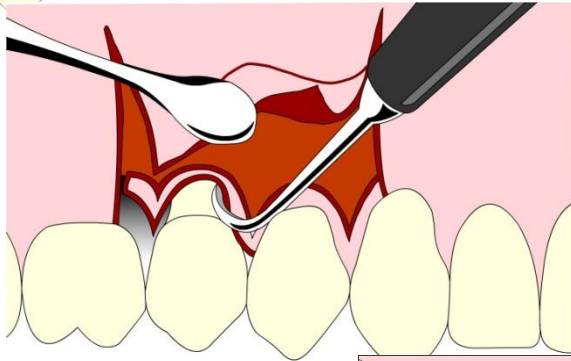
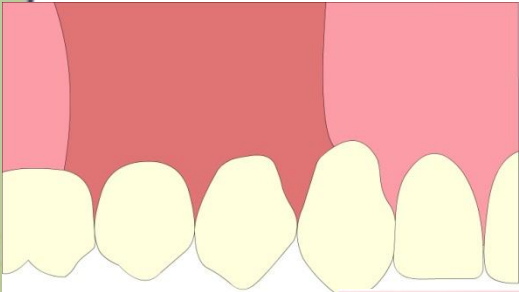
# Modified Widman flap

- *Indications:* pocket depth reduction associated with horizontal bone loss and adequate width of keratinised mucosa, gingival hyperplasia, aesthetic areas
- *Contraindications:* lack of keratinised mucosa

# Gingivectomy



# Modified Widman flap

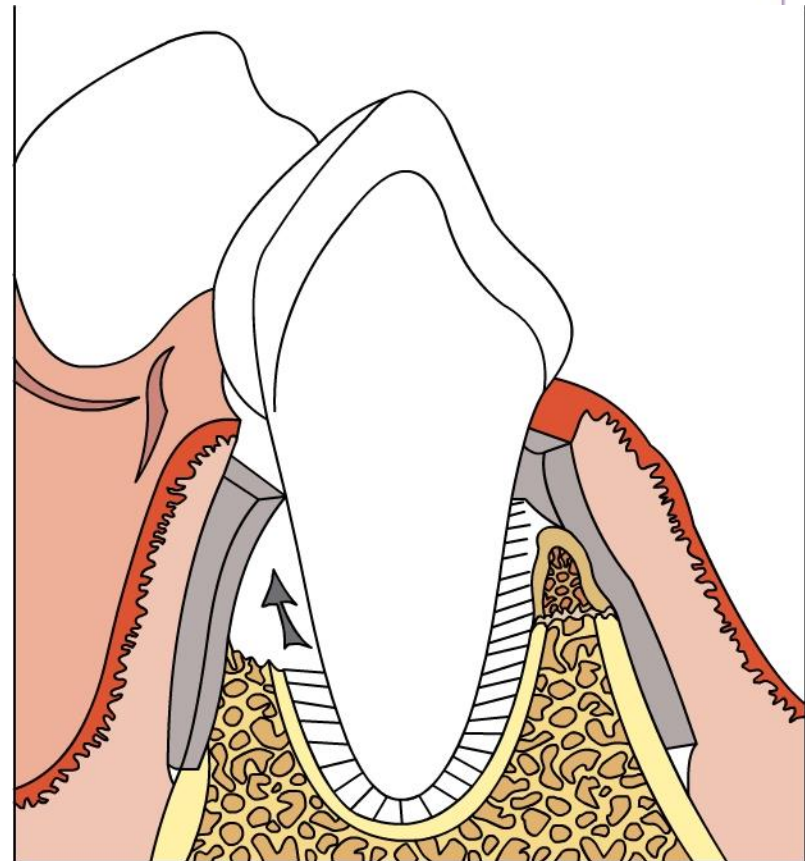


# Take home message

- Post operative treatment of gingivectomy and flap surgery is very different
- Gingivectomy sites can be S/C, probed and punched 2-3 weeks after surgery
- Flap surgery need to wait for 3-6 months

# Guided Tissue Regeneration

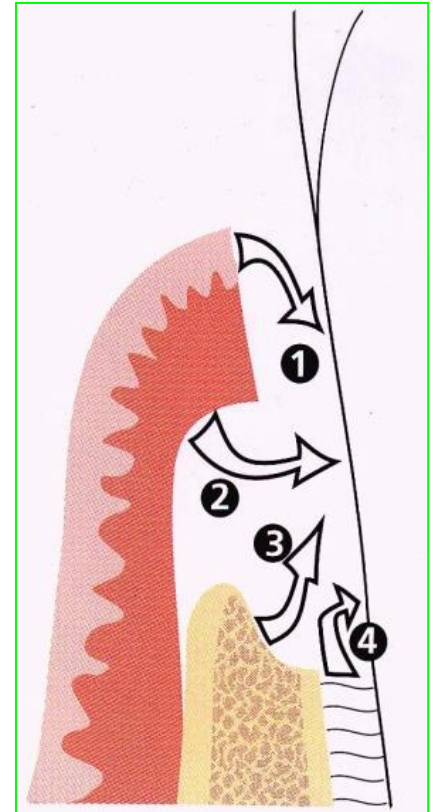
- GTR involves the placement of a physical/biological barrier to ensure that the root surface becomes repopulated with PDL and bone cells





# Guided tissue regeneration

- The disclusion of epithelial and gingival connective tissue cells relates to their inherent growth/migration rates
- Epithelial cells → hours to days
- Gingival CT cells → days to weeks
- PDL cells → days to weeks
- Bone cells → weeks to months





# Bio-Oss & Bio-gide















# Take home message

- Any site that has undergone GTR can not be probed or S/C subgingivally for a minimum of 6 months
  - The length of time that this period will extent to will be determined by the material used for the regeneration
  - Perioglas<sup>®</sup> (6-12 months) > Bio-Oss<sup>®</sup> (12-18 months)> Emdogain<sup>®</sup> (2-3 years)



# Mucogingival surgery

- Surgery usually performed to correct soft and hard defects or deficiencies using soft tissue repositioning or grafting ie gingival recession and preprosthetic surgery



# Gingival recession

- *Indications for surgical correction include:*
  1. increases in recession
  2. dentinal hypersensitivity
  3. aesthetic concerns of the patient

# Gingival recession

- *Contra-indications to surgery:*
  1. medical history including:  
immunodeficiencies,  
coagulopathies
  2. No change in recession

# Lateral sliding flap



# Take home message

- Most recession defects stay the same, but never get better
- Do not probe these surgical sites for at least 3 months
- Can remove supragingival calculus if present
- **BE GENTLE**