Dental Materials I

Unit IX

Abrasives and Polishing Agents
What are Abrasives and Polishing Agents?

• EFDA intra-orally contours the margins, finish and polish amalgam restorations
• physical grinding away of tooth structure
• burs and diamonds
• impregnated paper discs
• prophy pastes and pumice
• cavijet and cavitrons = abrasive action
Factors that Effect Abrasion

1. size of the abrasive particle
2. pressure exerted against the surface
3. speed the abrasive moves across the surface
Indications

• rough areas
• removable appliances
• organic material that has tenaciously attached to the tooth and must be removed
Purpose

- smooth, polish, shine
- remove foreign matter
- remove extrinsic stain
- polish amalgams without damage to teeth
- avoid burning or scorching acrylcs
Technique & Preparation

- **Dentist** prepares tooth structure
- **Hygienist** cleans, abrades and polishes
- Used on removable appliances
- Materials used unbound particle abrasives and polishing agents + water = slurry
- **RDH** = removes calculus, polishes
- **DA** = polish dentures, partials, retainers, custom trays or guards & coronal polishing, amalgam polishing
- **Dentist** = smooth and refine restorations
Commonly Used Abrasives

Emery

- a natural oxide of aluminum
- also called: corundum
- impregnated on discs
Commonly Used Abrasives

Aluminum Oxide

- pure form of emery
- effective powder for polishing metals
- impregnated on paper discs
- high luster for amalgams/metal
Commonly Used Abrasives

- Garnet
  - A number of minerals impregnated on paper or plastics discs
Commonly Used Abrasives

Pumice

- abrasive powder
- 6 different grits & various particle sizes
- flour of pumice for prophys or amalgam polishing
- x-coarse for lab work
Commonly Used Abrasives

Zirconium Silicate

- powdered substance in prophy paste
- impregnated in points
- high luster amalgams
- polishing wheels and strips
- refining composites
Commonly Used Abrasives

Diatomaceous Earth

• abrasive for polishing
• a filler for other pastes
• ie: alginate or stone
• known as “kieselguhr”
• a mined product
Commonly Used Abrasives

Tripoli

- mild abrasive action
- polishing agent
- good for gold
- high luster
Commonly Used Abrasives

**Rouge**

- fine, red powder - iron oxide
- excellent for polishing gold
- impregnated in wheels
- compressed into brick form
- very messy to handle – not typically used in the mouth in brick form
Commonly Used Abrasives

Tin Oxide

• amalgam polishing agent
• powder
• mix with water or glycerin to form a slurry or paste
• high luster or sheen
Commonly Used Abrasives

Sand

- form of quartz
- impregnated on discs
- adjustments
- refining margins
Commonly Used Abrasives

Carbides

• silicone carbide or boron carbide
• abrading agents on stones or burs
• substitutes for diamond chips
• different shaped blades or serrations
• increases cutting efficiency
Commonly Used Abrasives

Aluminum Carbide

• impregnated in white stones
• adjustments
• refining margins
Commonly Used Abrasives

Diamond

- hardest and most effective abrasive
- removes enamel quickly
- chips are impregnated on bur shanks or discs
- chips are x-fine to x-coarse
- gross removal
Commonly Used Abrasives

Carborundum

• very coarse - Joe Dandy

• adjustments or refining shape
Polishing Agents Pastes/ Powders

Polishing Agents or Pastes

• most common form is a paste
• impregnated onto:
  • discs, points, lightening strips,
  • polishing strips, finishing strips
• greenie or brownie points
• tooth polishing pastes
Polishing Agents Pastes/Powders

Purpose of a Dentifrice

• smooth surface
• pellicle has harder time attaching to the tooth
Polishing Agents Pastes/Powders

Typical Tooth Paste Contains:

- 20-30% water for consistency
- *humectant* to retard drying out
- *detergents* to remove stains or deposits
- *binders* to prevent separation of ingredients
Polishing Agents Pastes/Powders

Typical Tooth Paste Contains:

- *coloring and flavoring* for feelings of freshness + cleanliness
- *fluoride* to increase strength + reduce sensitivity of exposed dentin or cementum
- *crystal growth inhibitors* to retard the mineralization of plaque & supragingival calculus
Microabrasion

Enamel Abrasion:

- Enamel Microabrasion
- eliminates superficial discoloration
- Etching away tooth structure to remove deep grooves stains
- textural abberation in enamel
- 18% slurry or hydrochloric acid in a slurry of pumice slowly penetrated the enamel
- a chemical and abrasive erosion takes place - abrasion
Microabrasion

Abrasion

• abrasion treated enamel must be polished immediately with a paste containing fluoride

• 4 minute application of a neutral topical fluoride
Air Abrasion

• a small version of a sand blaster
• introduced in the US in 1940’s
• designed to remove stains and tooth decay
• not highly recognized by the dental community
• faded out
Air Abrasion

Air Abrasion Technology

• reappeared in the 1980’s
• a patient friendly approach to restorative treatment
• air abrasion delivers high pressure aluminum oxide particles through a pen shaped handpiece with a small probe
Air Abrasion

• Unique Technology

• removes enamel, dentin and restorative materials without compromising the healthy tooth structure

• has a rather large vacuum system
Air Abrasion

- dentist can conservatively remove diseased enamel and dentin without use of local anesthetic
- not meant to replace convention rotary instruments
- most effective for sealants, external stain removal, endodontic access
- Class I and Class VI preparations
Tooth Brushes

- filaments composed mainly of nylon
- filaments (bristles) should be round ended
- graded filaments are soft, medium or hard
- stiffness controlled by size of the filament
- the larger the filament the stiffer the brush
Tooth Brushes

Best

- softer brushes
- best suited due to pressure exerted
- effects of cervical abrasion
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Mediums for Abrasives

• paper discs
• plastic discs
• strips
• stones
• silicone points
• pastes
• dry powders
• compacted forms
• impregnated on burs