Amalgam Restorations

- Introduction
- Technique
- Class I
- Class II
- Class v

AMALGAM RESTORATIONS

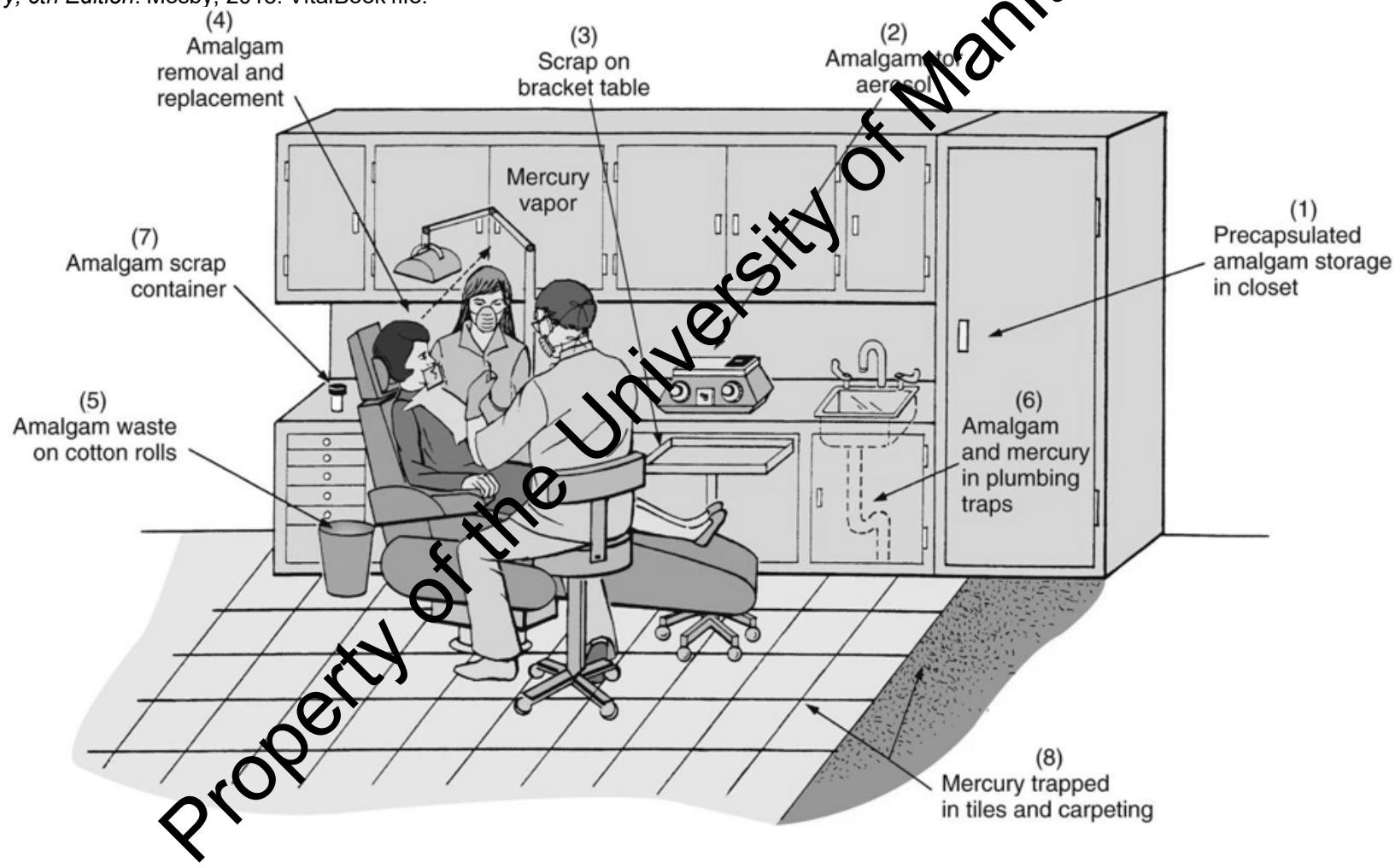
- • Introduction
- • Composition of Amalgam
- • Indication and contra-indications of its use
- • Hazards: toxicity and prevention
- • Step by step
- – Proper technique
- – Trituration
- – Condensation
- – Carving
- – Finishing and polishing

Introduction

- *Amalgam* = alloy of mercury (Hg) with any other metal
- *Dental amalgam*
- Alloy made by mixing mercury with silver-0n (Ag-Sn) alloy
- Along with varying amounts of copper (Cu) and small amounts of zinc (Zn).
- ** *The use of amalgam is declining***

Sources of mercury hazards in the dental operatory

Heymann, Harold, Edward Swift, Andre Ritter. *Sturdevant's Art and Science of Operative Dentistry, 6th Edition*. Mosby, 2013. VitalBook file.



Sources of mercury hazards in the dental operatory

Heym ann, Harold, Edward Swift, Andre Ritter. *Sturdevant's Art and Science of Operative Dentistry, 5th Edition*. Mosby, 2013. VitalBook file.

- (1) some mercury vapor released from stored materials;
- (2) small losses from capsules during trituration;
- (3) spillage during manipula0on for tooth restorations;
- (4) some vapor exposures to the dentist, the assistant,
- and the patient during removal, placement, or finishing
- or polishing of amalgam;
- (5) contamina0on of cotton rolls;
- (6) collection of debris via vacuum suction into the
- plumbing system and the sewer system;
- (7) collection of remnants in a jar for recycling; and
- (8) mercury trapped

Summary: Mercury – Use and Abuse

Mercury - It's use and abuseHeymann, Harold, Edward Swift, Andre Ritter. *Sturdevant's Art and Science of Operative Dentistry, 6th Edition*. Mosby, 2013.

- Proper mercury hygiene;
- – Rubber dam
- – Gloves
- – Masks
- – High Volume Suction
- – Office ventilation
- • Prevention checklist – see manual pg 28.

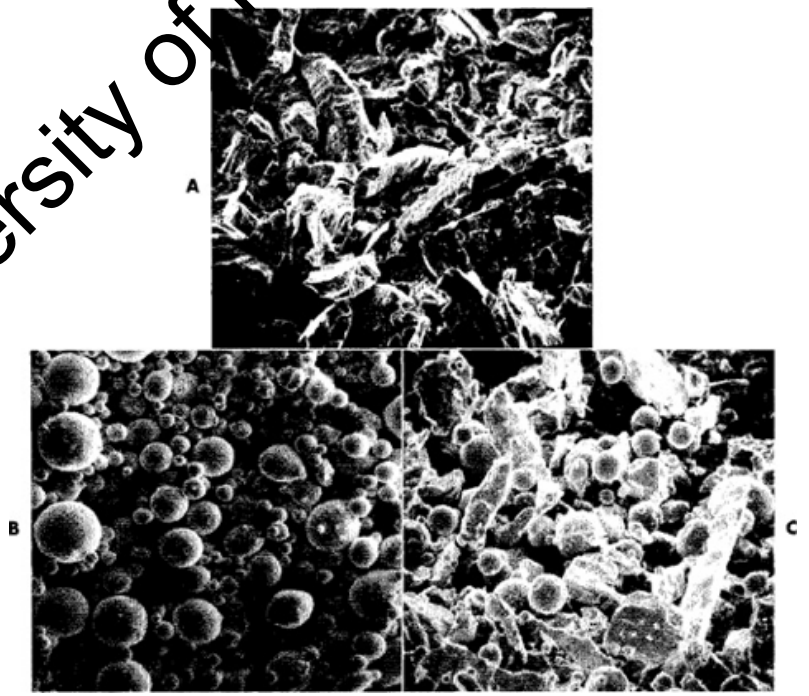
AMALGAM RESTORATIONS

- The quality of the amalgam restoration depends on:

- Composition
- Manipulation
- Placement
- Finishing

TYPES OF AMALGAM

- **Composition of the alloy**
- Low copper/High copper
- **Particle size & shape**
- Lathe-cut A, Spherical B, Admixed C



Before you start

- Know your material: type of amalgam, pick up/condensing time and carving time

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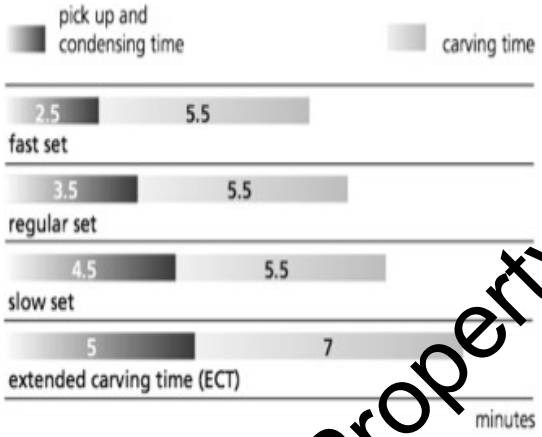
Amalgam: Permite® (SDI)

- Non-gamma 2
- ***Admix***



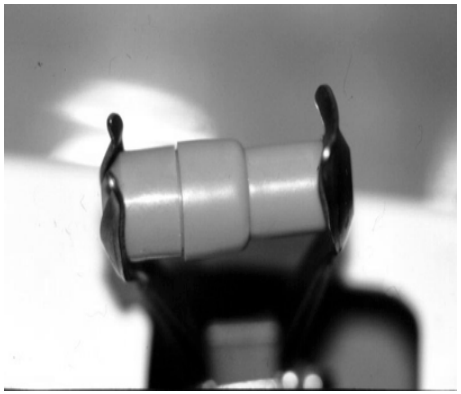
Physical properties

composition	Ag 56%, Sn 27.9%, Cu 15.4%, In 0.5%, Zn 0.2%, Hg 47.9%
alloy particle	spherical and lathe cut
compressive strength @ 1 hour	260MPa (37,700psi)
compressive strength @ 24 hours	500MPa (72,500psi)
diametral tensile strength @ 1 hour	28MPa (4,060psi)
diametral tensile strength @ 24 hours	54 MPa (7,830 psi)
static creep @ 7 days	0.2%
dimensional change @ 24 hours	+4μm/cm

Before you start
Have your instruments handy

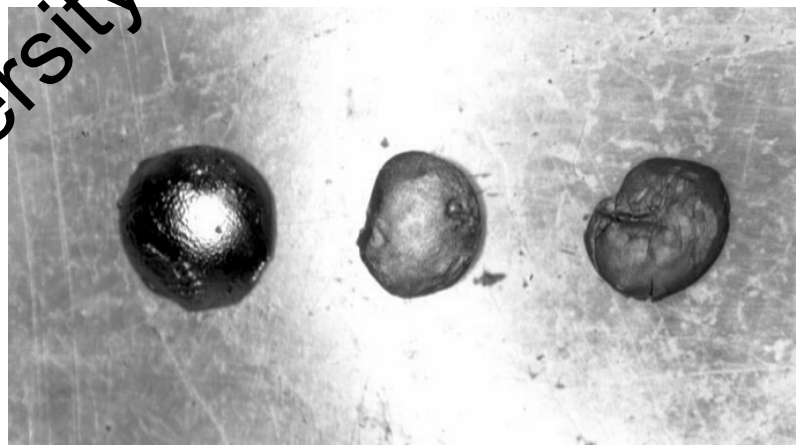
TRITURATION (MIXING)

- Amalgamator
- Follow manufacturers recommended Time and Speed
- Compress capsule to activate and place in amalgamator



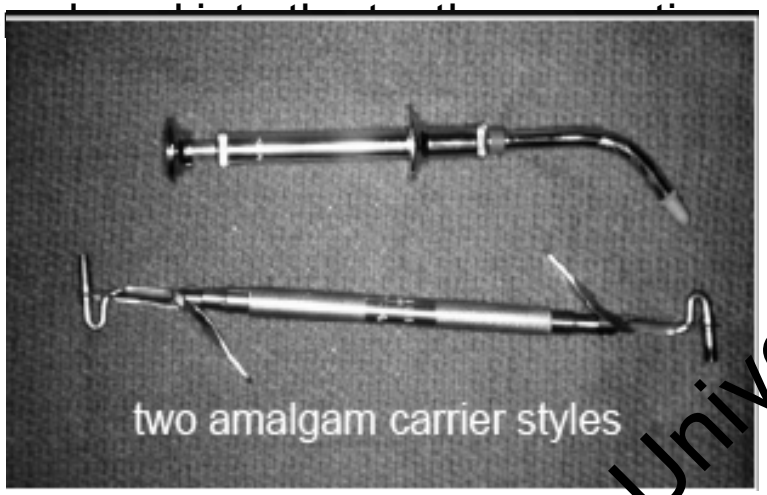
TRITURATION (MIXING)

- Characteristics of mix:
- Over-mixed: overly shiny and mushy.
- Under-mixed: dull, crumbly, non-cohesive
- Proper mix: shiny, smooth, cohesive and “squeaks” when condensed



TRITURATION (MIXING) PLACEMENT

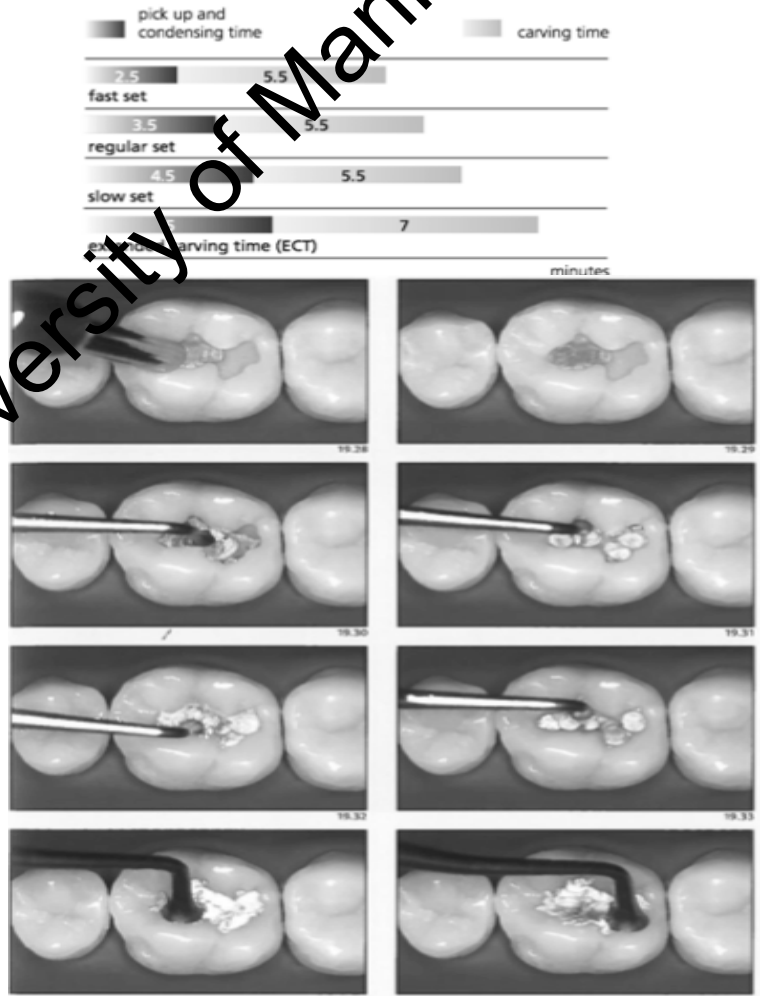
Once some of the amalgam is picked up with the carrier, the increment is
the



CONDENSATION Technique

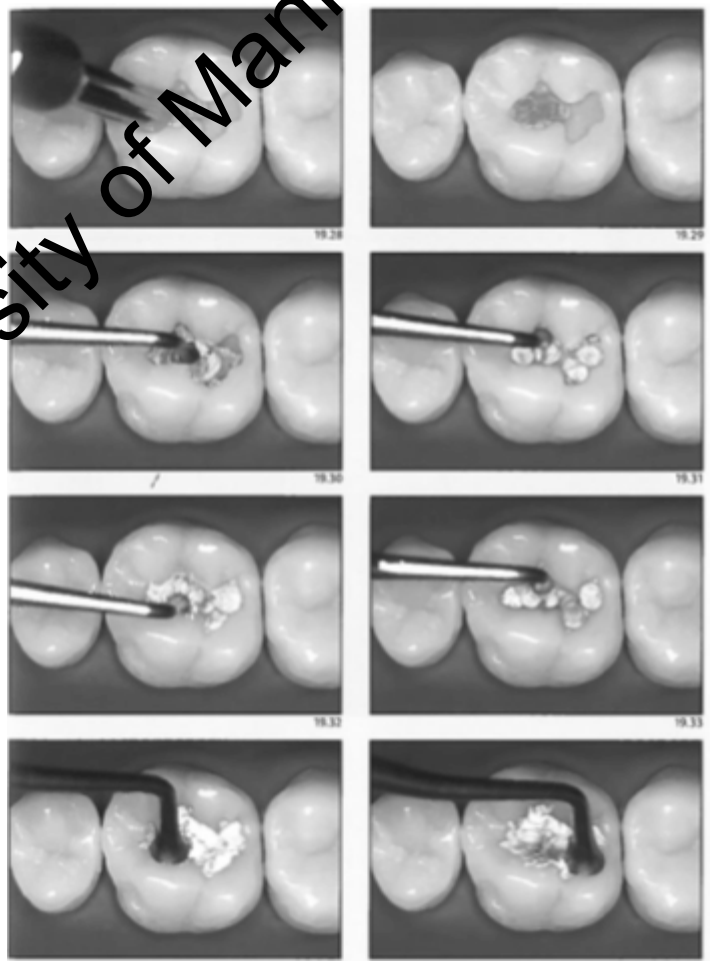
Images: Baratieri, Monteiro Jr, Melo et al. (2014) Routes for excellence in restorative dentistry

- Condensed in small increments using
- A “stepping” technique:
- Overlapping steps - minimize porosities and increase strength
- Do not delay between layers – want good adaption of increments
- If Ag becomes dry and difficult to pick up in carrier Should discard and get fresh mix
- Overfill preparation slightly



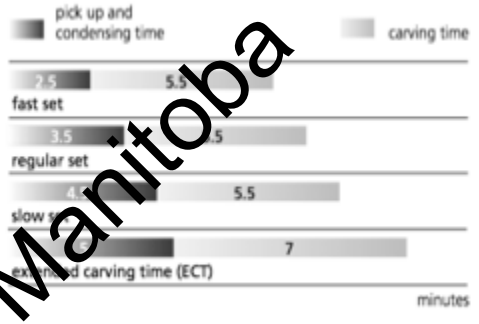
CONDENSATION: Technique

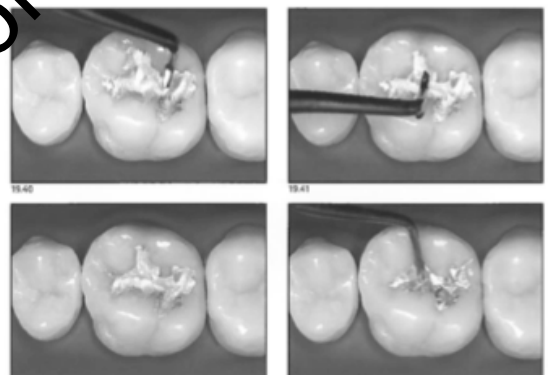
- Condenser size:
- Starting with the smallest condenser nib and progressing to larger ones. The largest condenser used at the cavo-surface margins.
- Condensing direction:
- Vertical against pulpal and gingival floors
- Lateral at internal angles and proximal box
- Perpendicular at cavo-surface margins.
- ** Condensation: heavy condensation
- pressure
- Images: Baratieri, Monteiro Jr, Melo et al. (2014) Routes for excellence



CARVING

- Burnish amalgam before carving
- Move instrument from *tooth* to *amalgam* not vice versa – may cause a "ditched" margin.
- Rest instrument on tooth and amalgam using tooth to guide your anatomy-track through the developmental grooves.
- The Tip of the instrument will create the central groove.
- Recreate functional anatomy

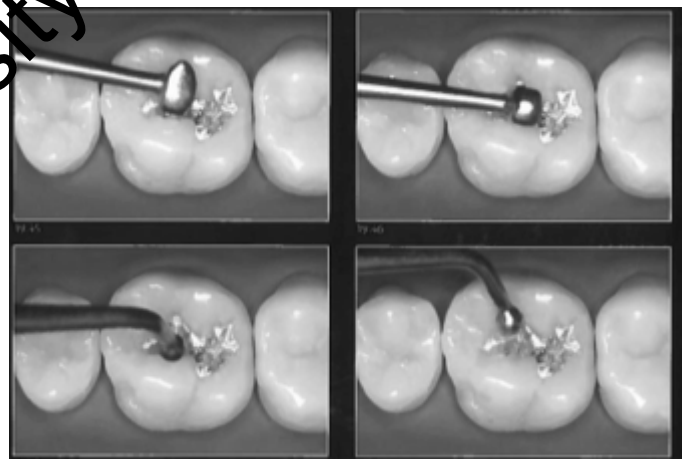




Images: Baratieri, Monteiro Jr, Melo et al. (2014) Routes for excellence in

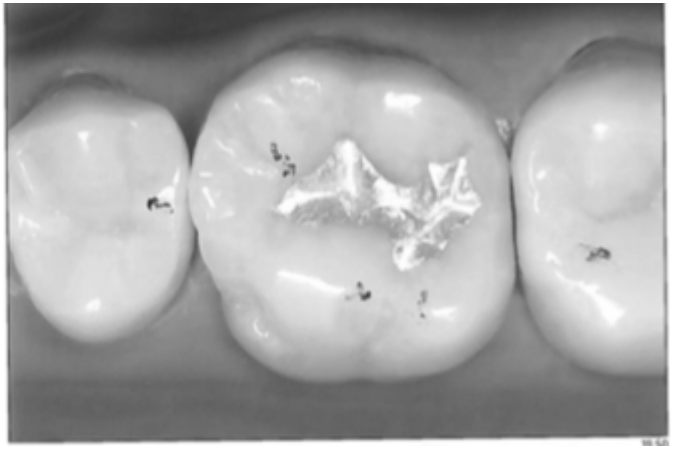
CARVING

- Margins – amalgam and tooth
- margin form butt joint
- – No deficiencies (open margin or sub marginal defect)
- – Overextension (flash)
- • Gently use explorer to assess
- margins
- • Burnish amalgam after carving completely
- Images: Baratieri, Monteiro Jr, Melo et al. (2014) Routes for excellence



OCCLUSION CHECK and post-operative instructions

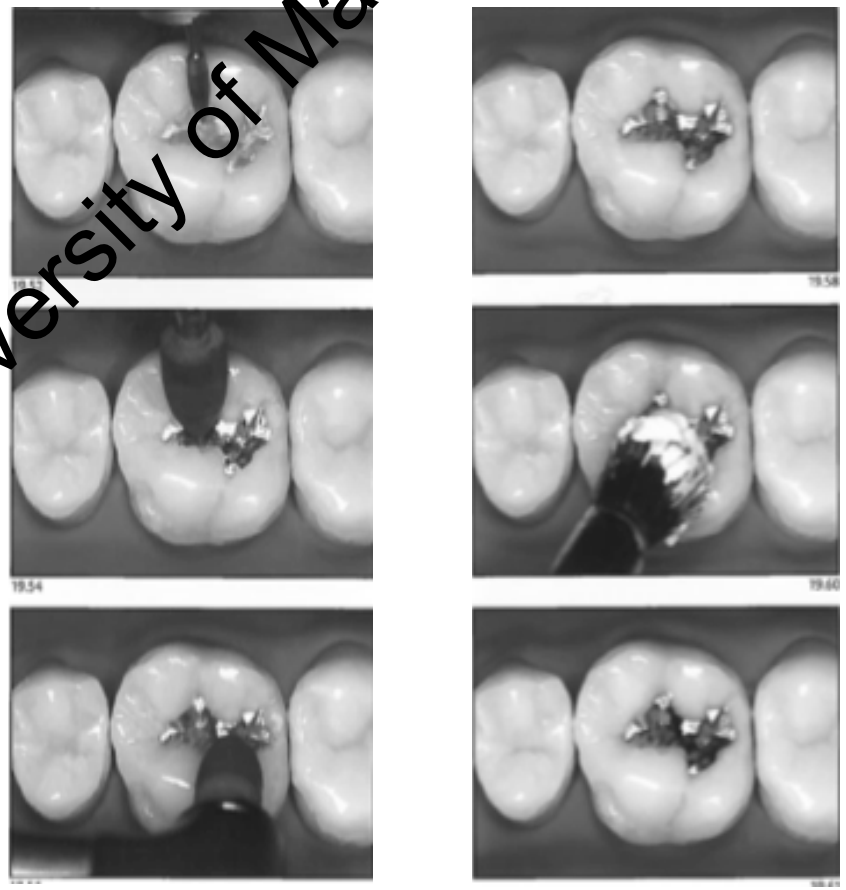
- • Remove the rubber dam
- • Using an articulating paper,
- ask the patient to bite gently
- • Remove any excess
- • Redo until patient is
- comfortable and occlusion is
- acceptable.
- • Post-op instructions: advise
- the patient to chew on the
- opposing side for 24hours.



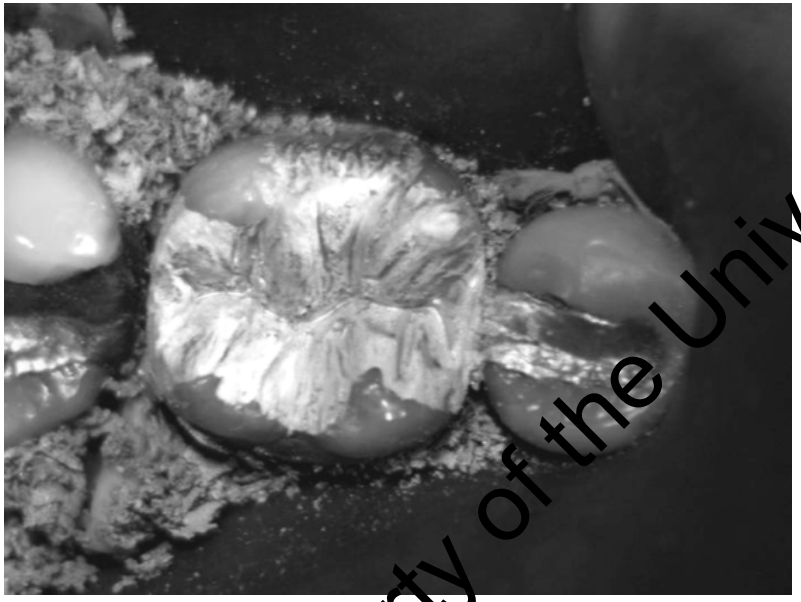
FINISHING AND POLISHING

- Done 24 hours after Amalgam placement to allow for full setting
- **Finishing** – correction of minor errors in contour, occlusion, anatomy and removal of flash.
- **Polishing** – Smoothing the surface of the restoration to a high gloss.
- Accomplished with:
- – burs
- – abrasive points,
- – polishing points and polishing pastes.

Images: Baratieri, Monteiro Jr, Melo et al. (2014) Routes for excellence in restorative dentistry



Freshly carved amalgam vs Polished amalgam



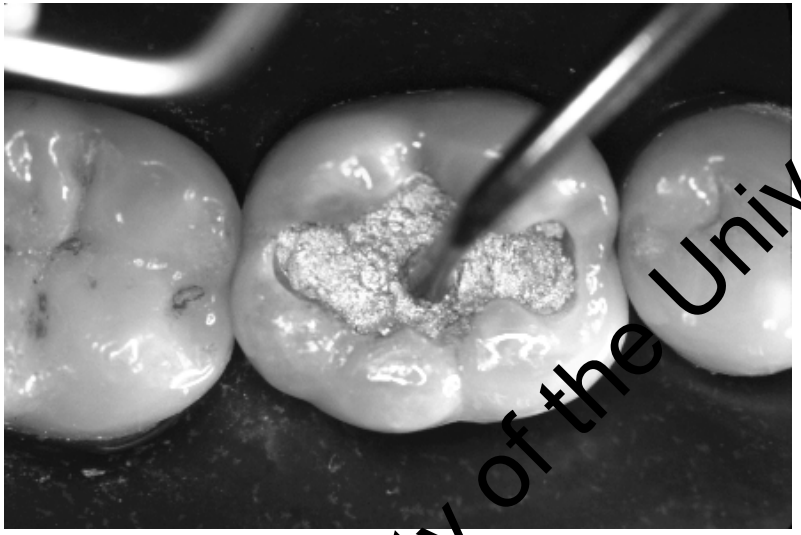
Summary

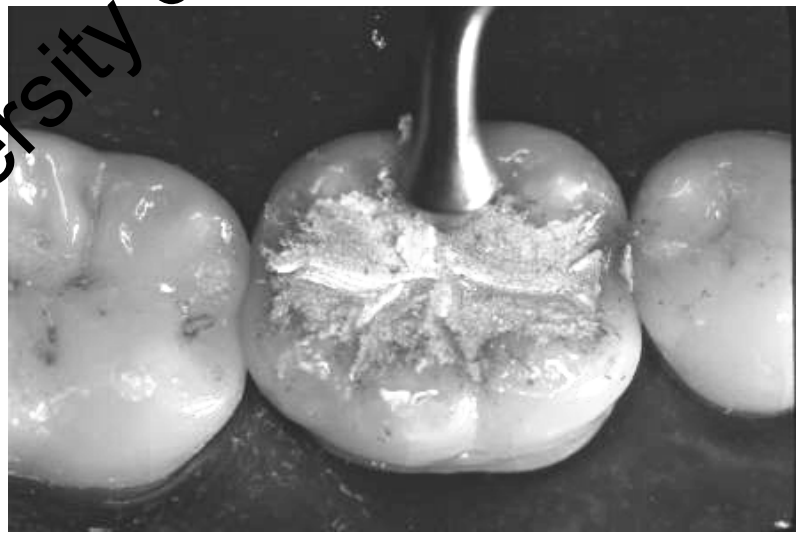
A successful & functional restoration should possess proper :

- Margins
- micro-leakage & recurrent caries
- Anatomy
- Physiologic function
- Contours
- Not adversely affect periodontal health

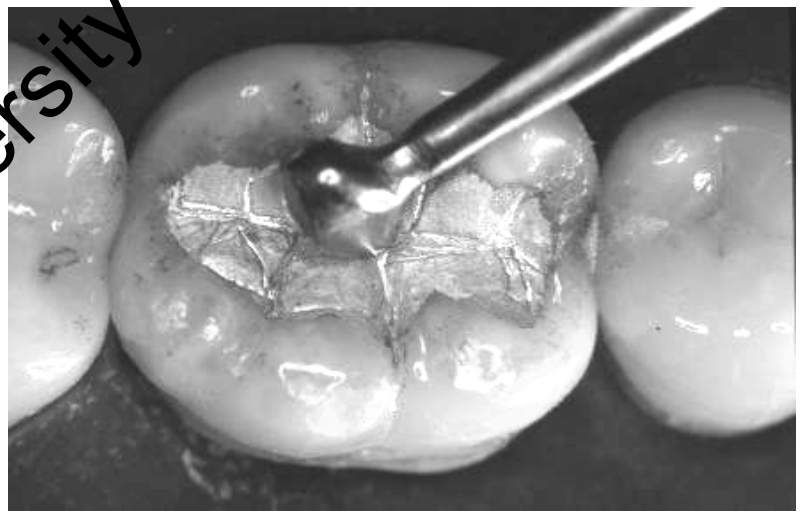
CLASS I

Condense into all internal angles first





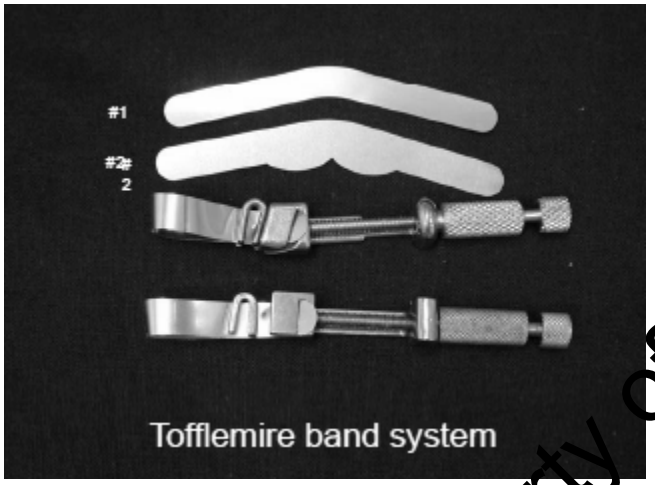
Use existing anatomy as a carving aid

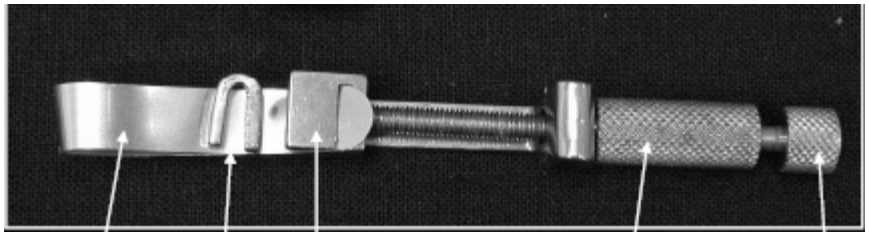


Final product

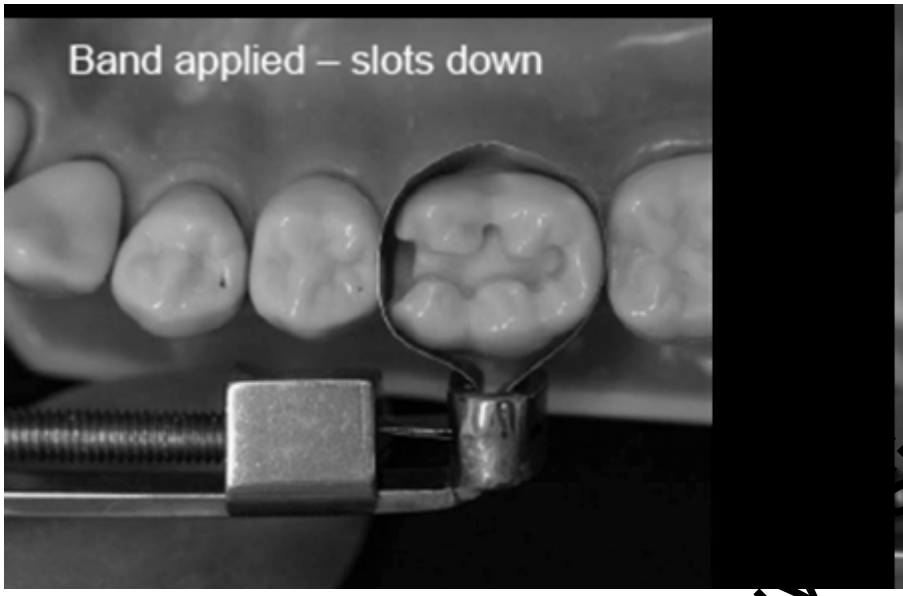
- CLASS II

Matrix System

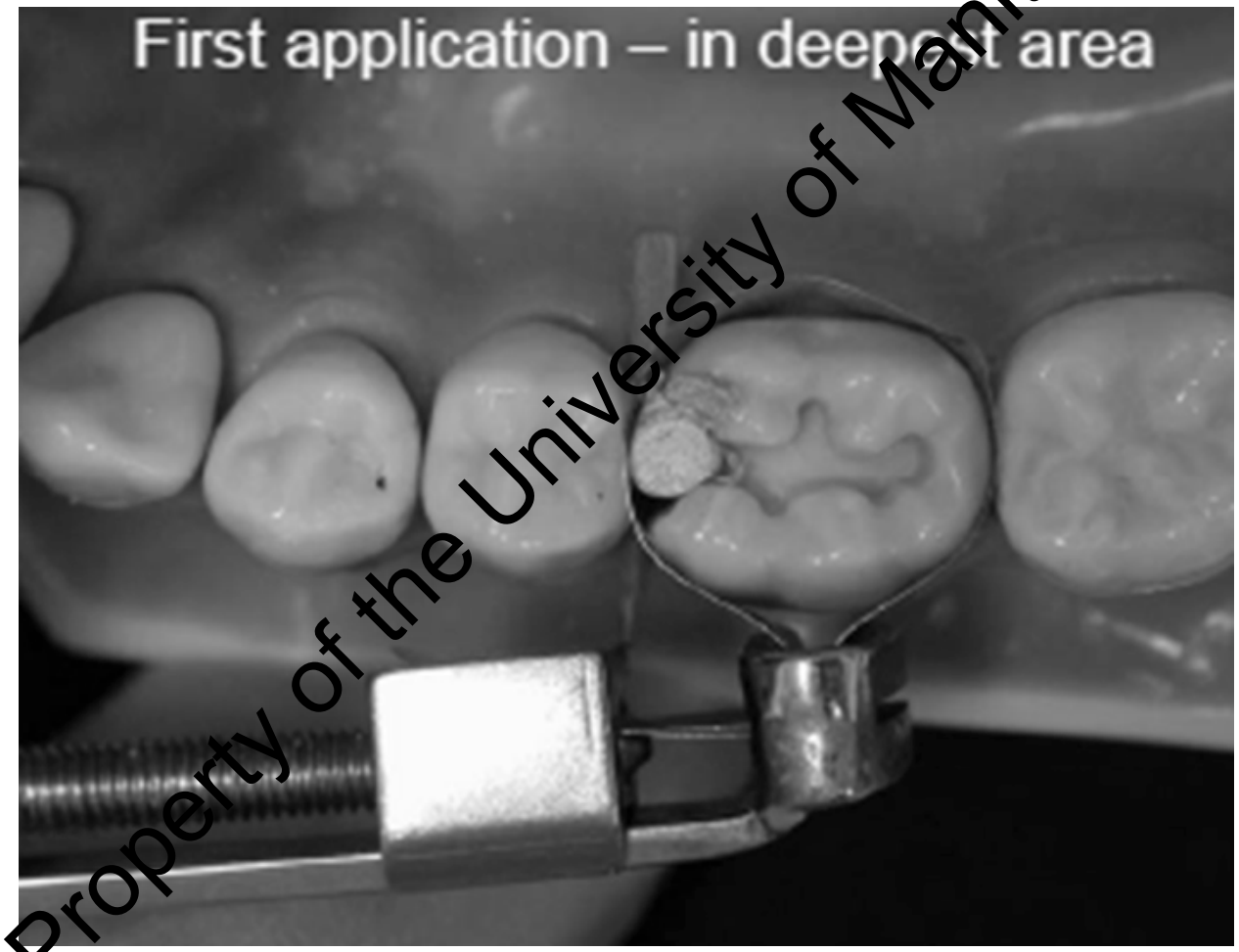




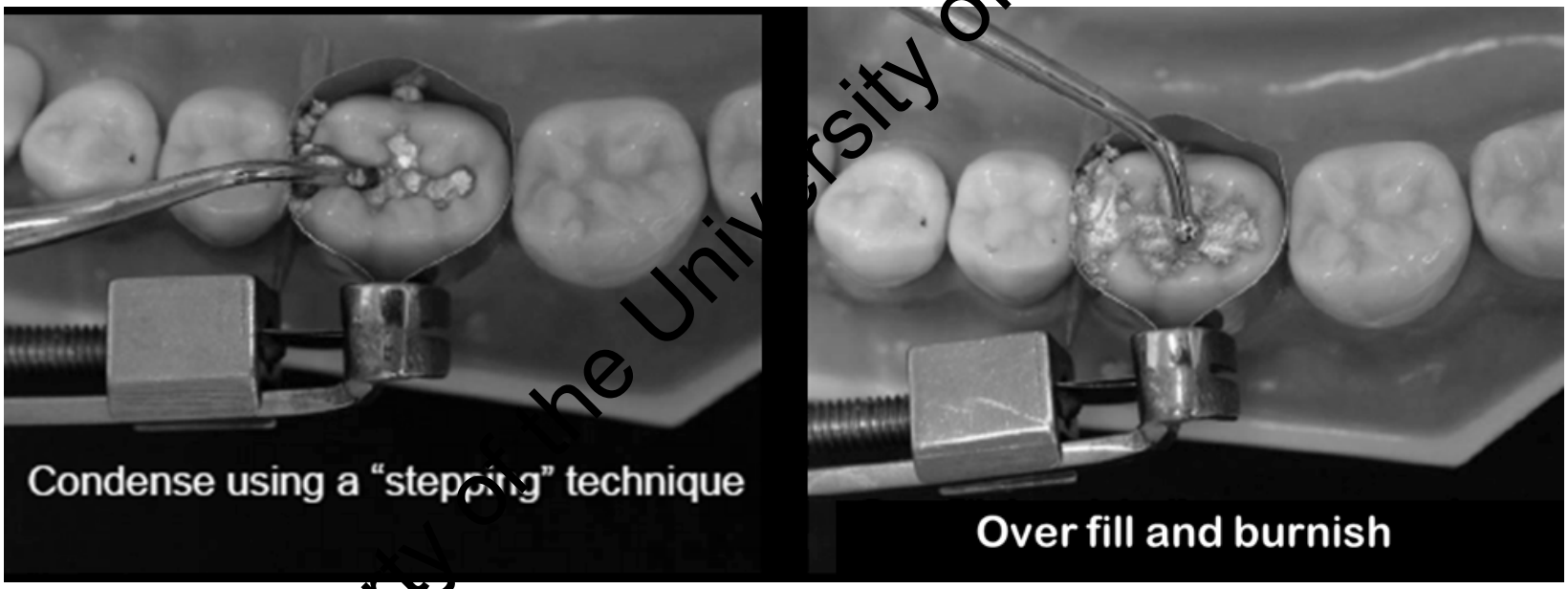
Matrix and Wedging



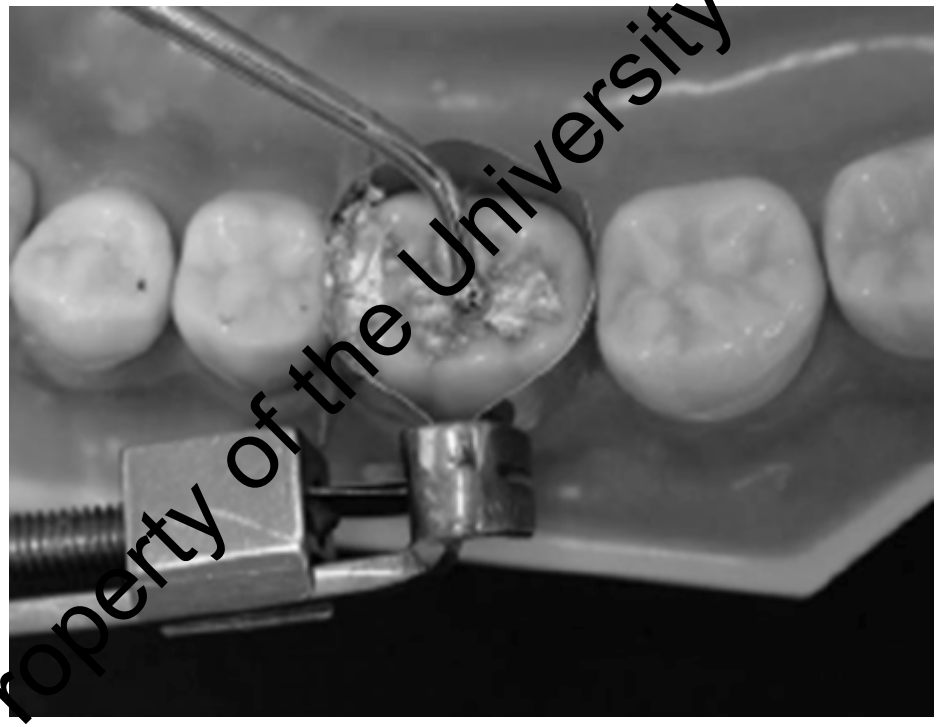
Amalgam Placement



Fill in increments Smallest condenser

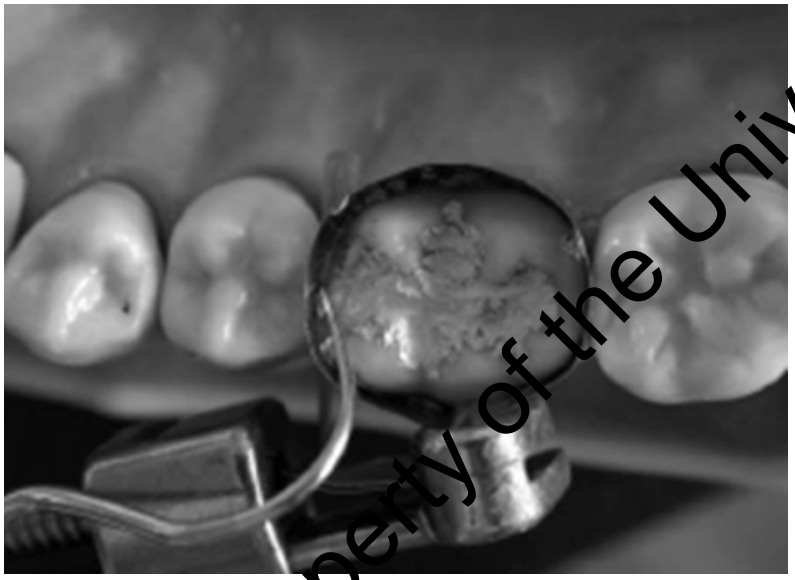


Burnish



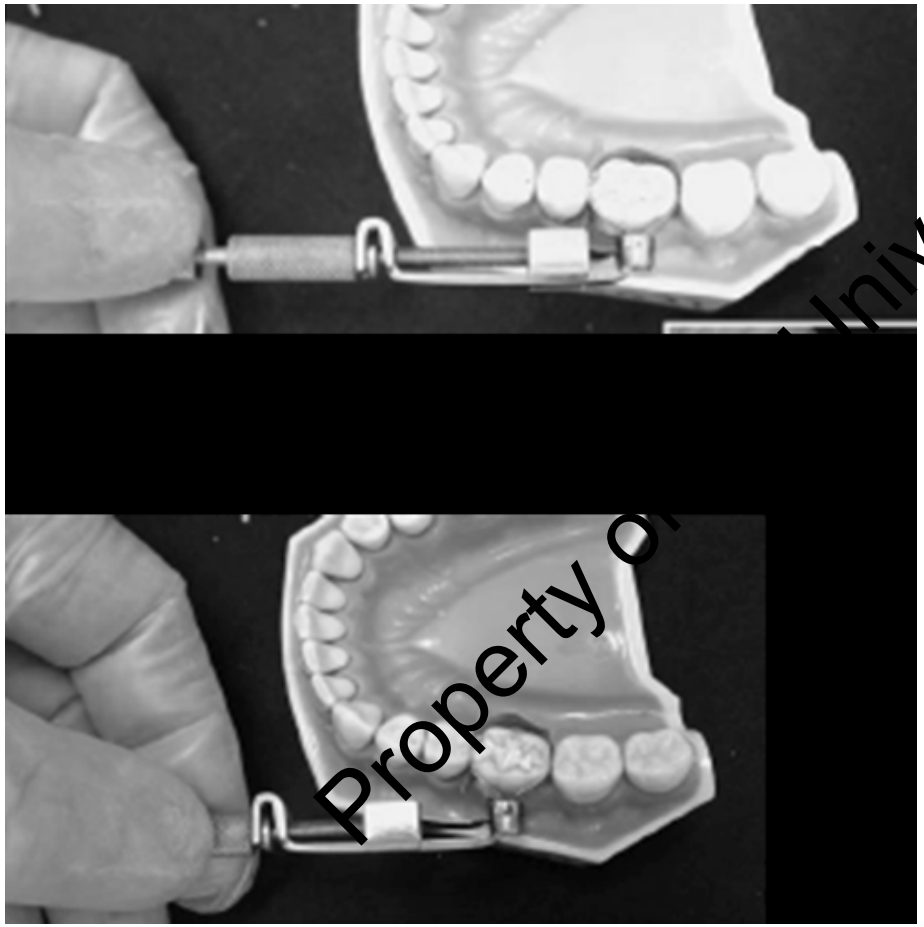
Initial anatomy

Prior to Band Removal



- Use explorer to gently remove
- excess amalgam around band
- to create occlusal embrasure
- space & MR height.
- • Hold tip at 45 degrees to band &
- tip should touch band at all
- times or else ledge may form.

Remove Band



- • Turn set screw to
- release the band
- Turn spindle to move the
- slide and expand the band

Remove tofflemire holder
Remove band from non-restored side of tooth

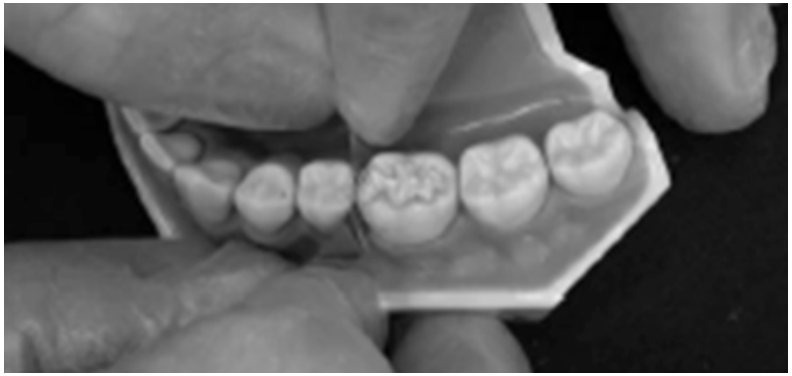
Band removal

Remove wedge with cotton

pliers

Gently seesaw band from

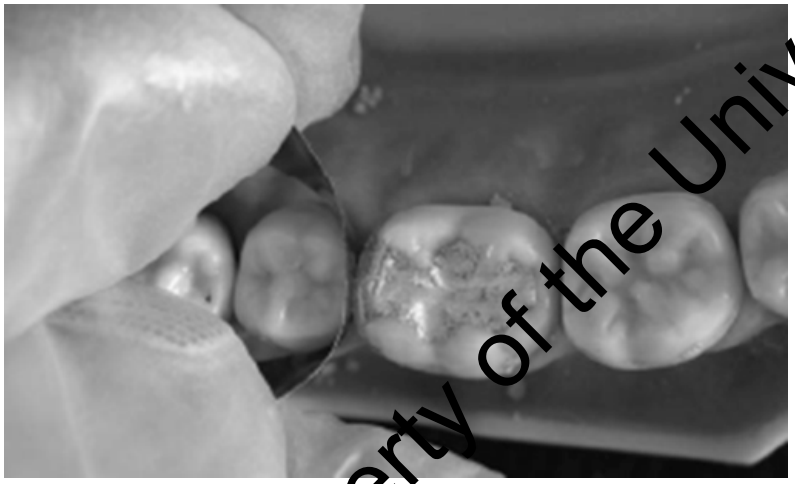
restored contact

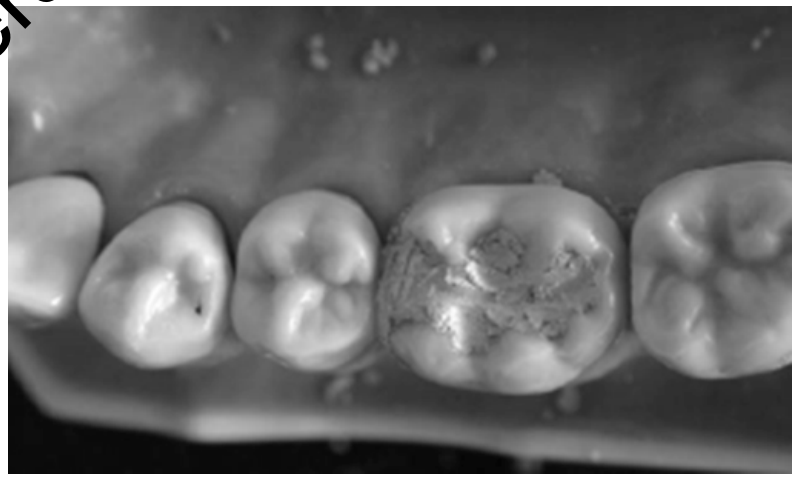


Key Points

Can use tip of large condenser to stabilize MR.

Can be susceptible to fracture with band removal.





Carving

Note: flash – slight excess

Use explorer to remove flash & overhangs

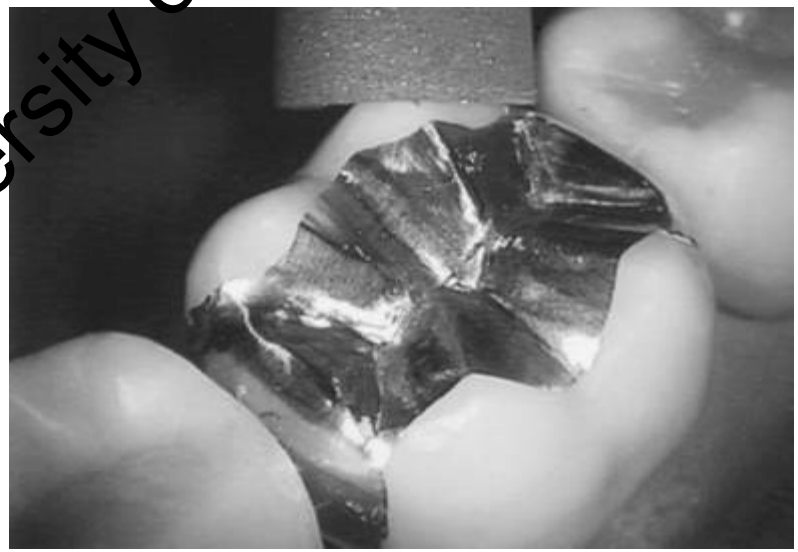
• Take care not to gouge amalgam with explorer tip!

Once carving is complete, burnish once more.

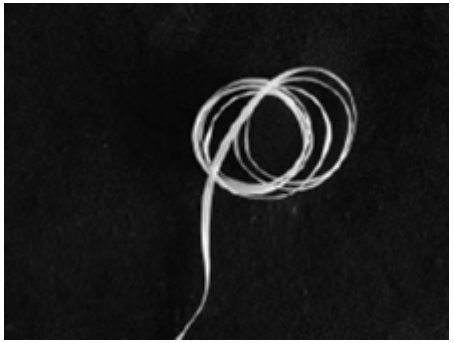
Class II Amalgam

Reproduce ideal:

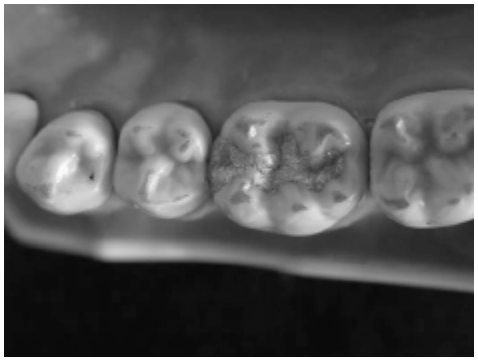
- Contact
- Position
- Size
- Embrasures
- Occlusal
- Gingival
- Vestibular
- Lingual
- Occlusal Anatomy
- As patient's occlusion allows



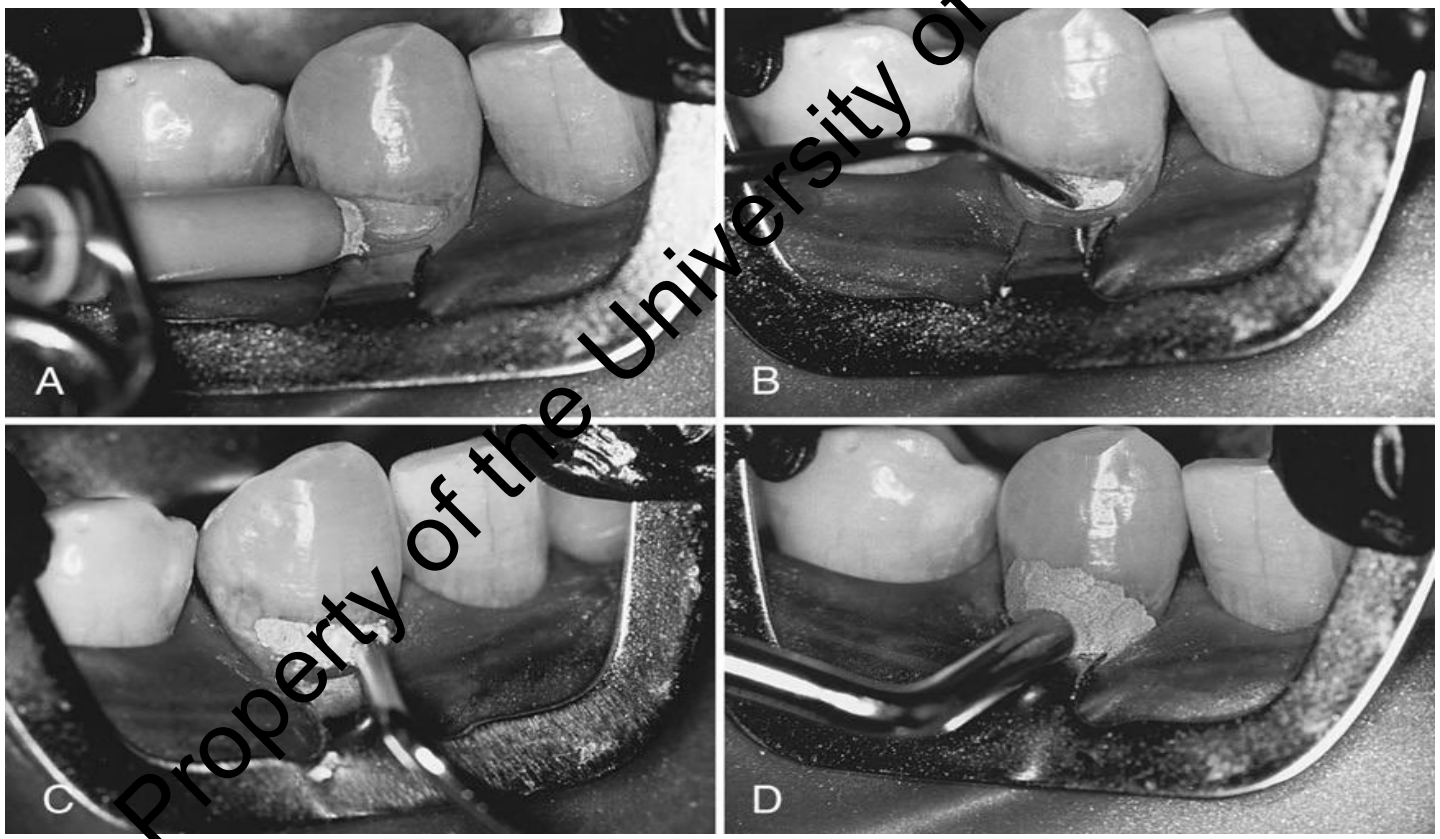
Contacts and Occlusion



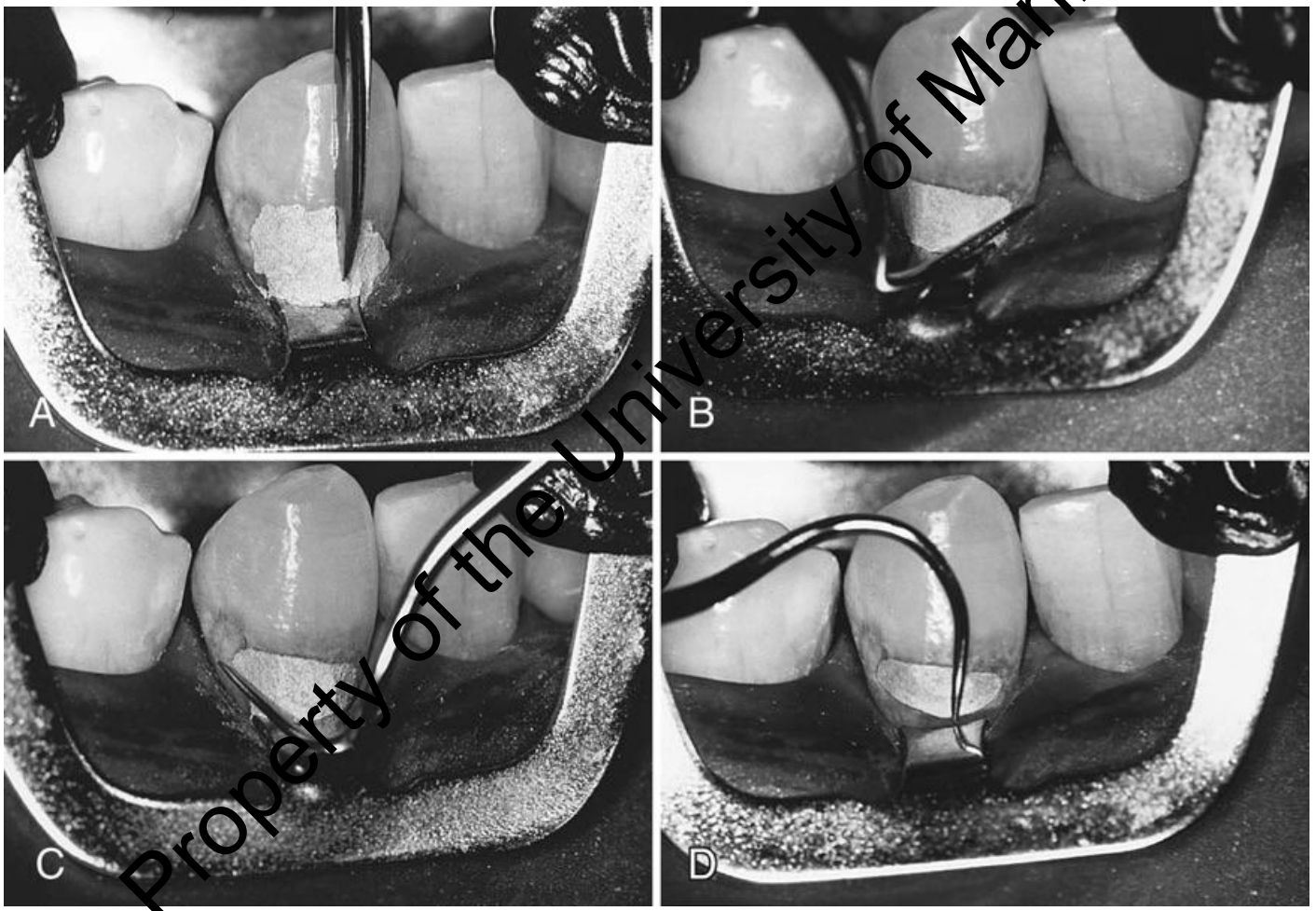
Gently floss through contact area
Check occlusion with articulating paper



Inserting amalgam. **A, Place amalgam into the preparation in small increments. B, Condense first into the retention grooves with a small condenser. C, Condense against the mesial and distal walls. D, Overfill and provide sufficient bulk to allow for carving.**



Carving and contouring the restoration. **A, Begin the carving procedure by removing any excess and locating the incisal margin. B and C, An explorer may be used to remove the excess and locate the mesial and distal margins. D, Remove the excess and locate the gingival margin.**



USE A LARGE CONDENSER OR A FLAT-BLADED INSTRUMENT TO OFFER RESISTANCE TO CONDENSATION PRESSURE APPLIED ELSEWHERE ON THE RESTORATION.

ProFin

- *https://dentatus.com/dental-products/profin*

All materials from:

Heymann, Harold, Edward Swift, Andre Ritter. *Sturdevant's Art and Science of Operative Dentistry, 6th Edition*. Mosby, 042012. VitalBook file.

Questions??????

Carving a Class I Amalgam

http://www.youtube.com/watch?v=enFUq2t5O-U

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