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Surveying Procedures

Dr Matsubara

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Learning outcomes

- Discuss the importance of study models
- Discuss the importance of surveying for the fabrication of an RPD
- Describe all steps of dental surveying
- Define the position of rest/rest seat, undercuts, minor and major connectors
- Describe the adjustment of the high of contour on abutment teeth

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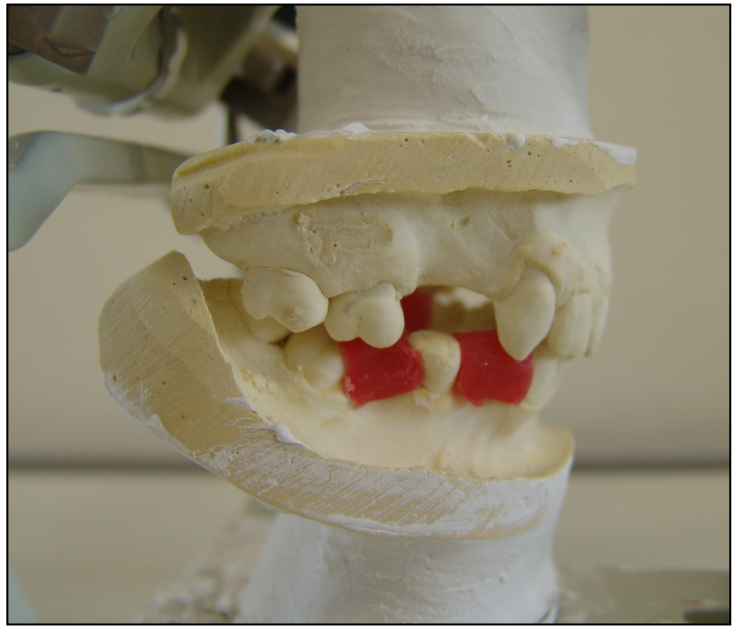
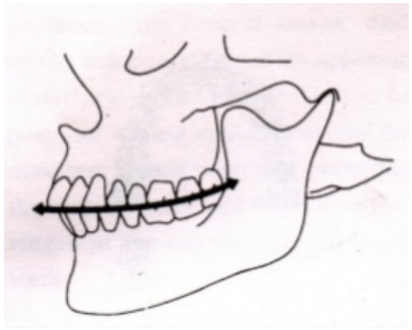
Study Model

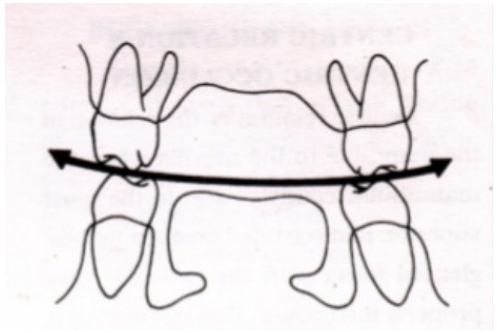
Dental stone (Type III gypsum)

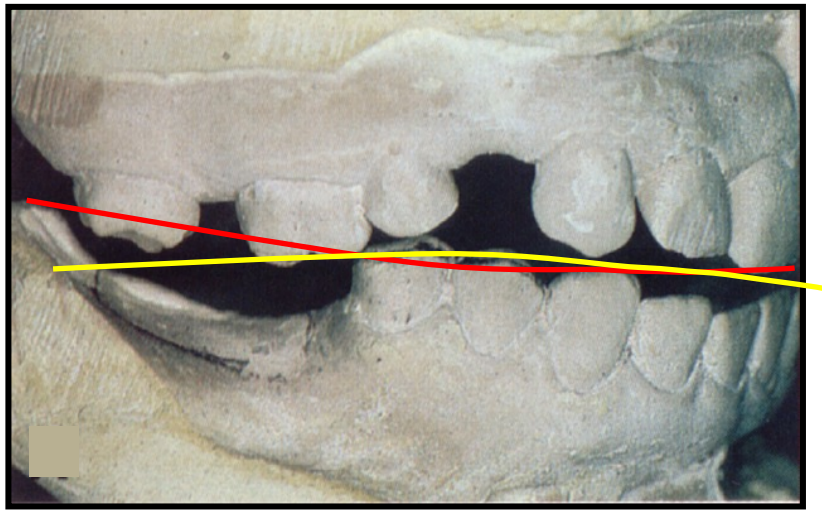


Function:

- Analysis of models mounted on the articulator
- Interim RPD*
- Surveying (Design of the RPD framework)
- Fabricate custom tray







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SURVEYING PROCESS

AIMS:

- Define the shape, form and contours of teeth and associated structures that will influence the RPD design
- Identify modifications of dental structures required to optimize RPD design
- Allows selection of Path of Insertion most compatible with:

• Aesthetic requirements
• Guiding plane location
• Retention - location and depth of undercut
• Hard & soft tissues interferences

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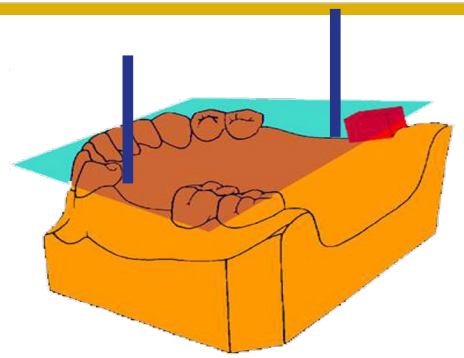
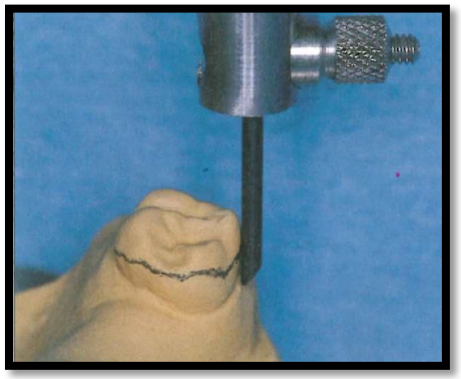
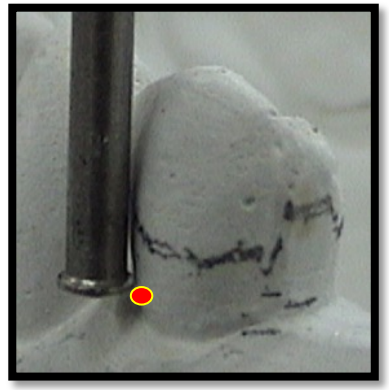
SURVEYING PROCESS

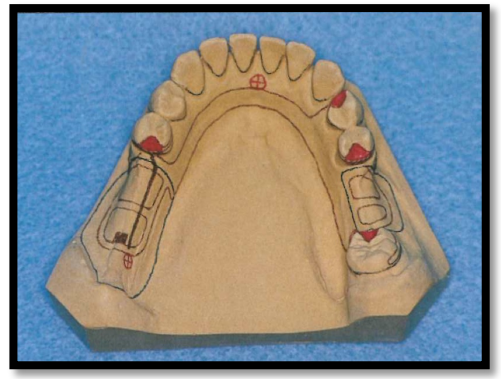


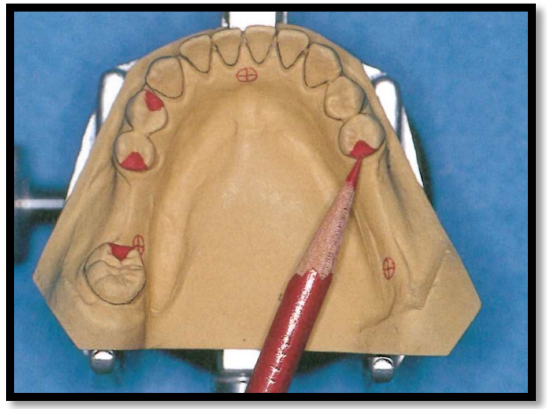




Steps:

1. Preliminary visual assessment
2. Determine the path of insertion
3. Mark the height of contour of teeth (identifying the retentive area)
4. Define the position of rest
5. Identify the desired undercut
6. Draw the outline of the framework
7. Adjust the height of contour and create guiding planes





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1) PRELIMINARY VISUAL ASSESSMENT

➢ Simple visual assessment made by the clinician, with the cast being viewed from above.

- Kennedy classification
- Fulcrum line(s)
- Potential rest seat location
- Indirect retention

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1) PRELIMINARY VISUAL ASSESSMENT

- Simply a visual assessment made by the clinician, with the cast being viewed from above.
- Relative parallelism of proximal tooth surfaces to be considered for the first time

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1) PRELIMINARY VISUAL ASSESSMENT

- Simply a visual assessment made by the clinician, with the cast being viewed from above.
- Relative parallelism of proximal tooth surfaces to be considered for the first time
- Gross problems relating to interference, contour and undercuts can be identified.

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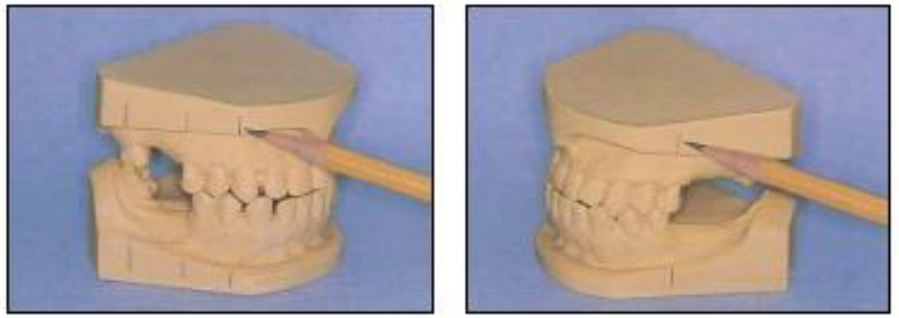
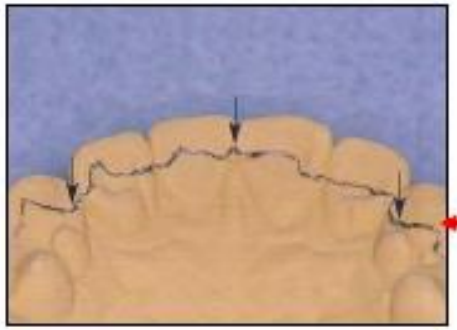
1) PRELIMINARY VISUAL ASSESSMENT

- Decide potential rest seat locations -mark with vertical black lines on bases.





- From posterior aspect mark vertical overlap.

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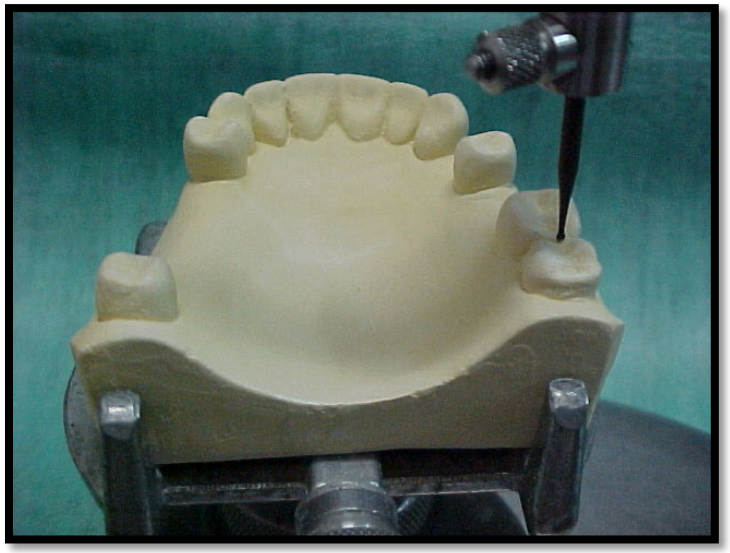
2) Path of Insertion

Roach technique (three points)

MAXILLA

Contact point 11 and 21



Marginal ridge of molars

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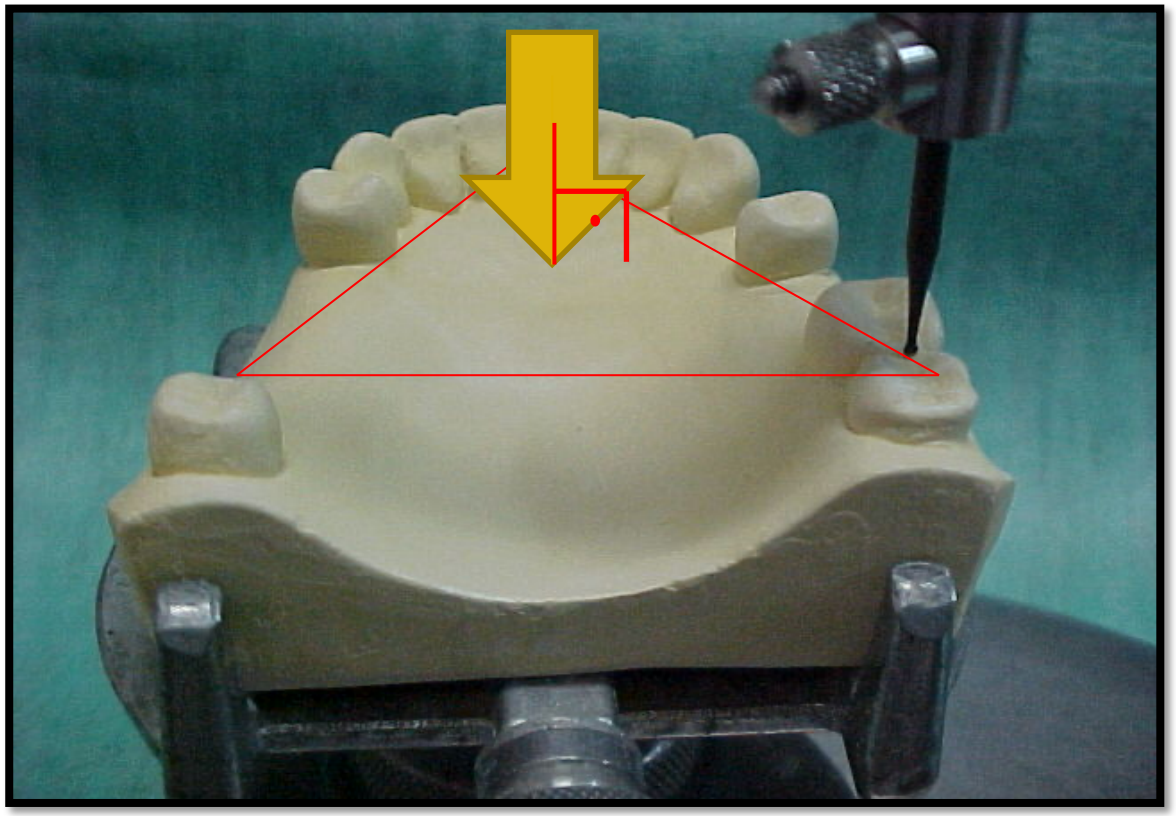
2) Path of Insertion

Roach technique (three points)

Occlusal table parallel to base of surveyor



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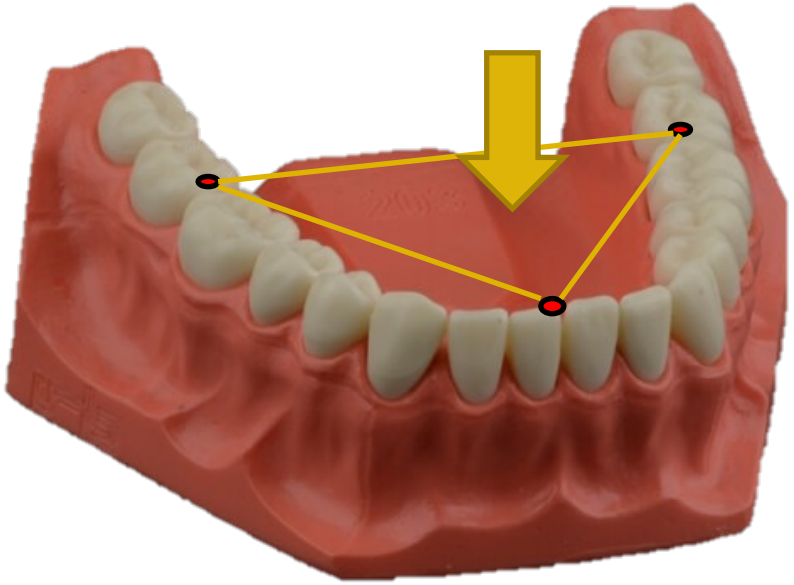
2) Path of Insertion

Roach technique (three points)

MANDIBLE



Incisal edge incisors

Marginal ridge of molars

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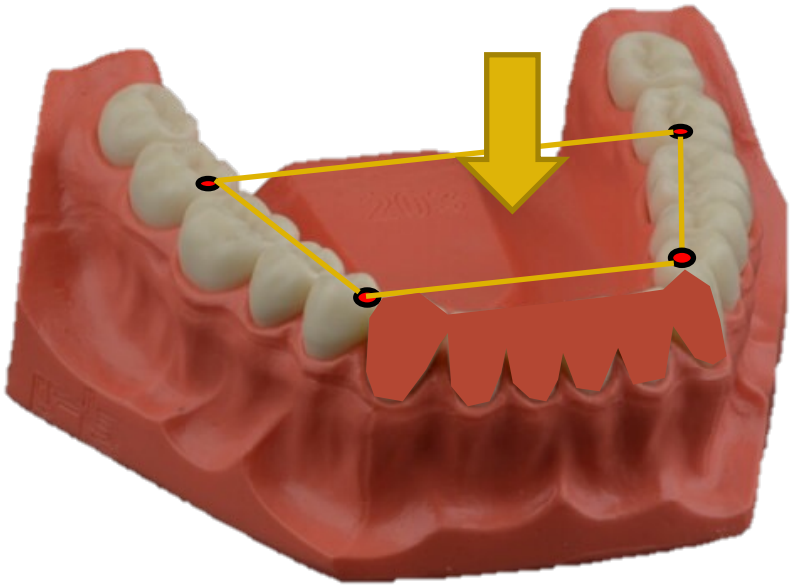
2) Path of Insertion

Roach technique (three points)

MANDIBLE



Mesial marginal ridges of pre-molars

Marginal ridge of molars

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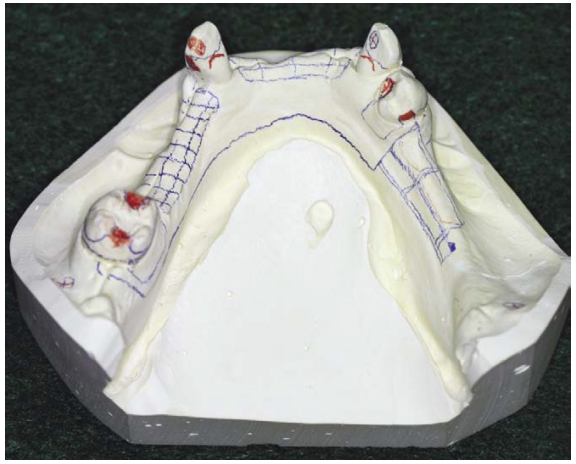
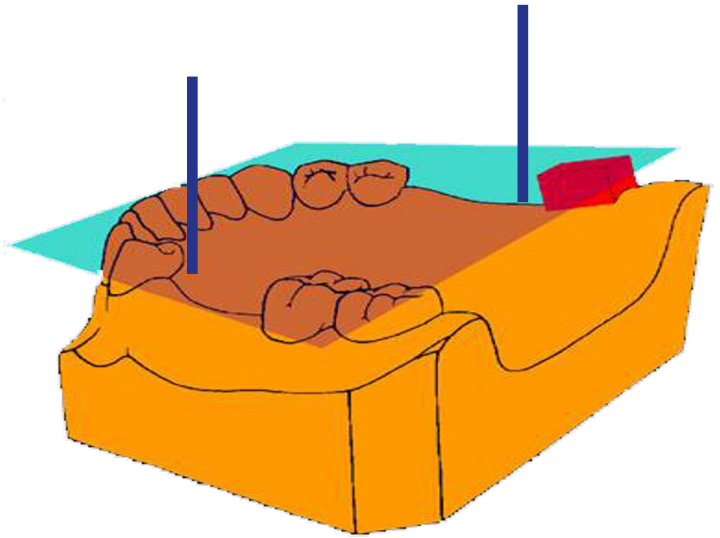


2) Path of Insertion

Roach technique (three points)

Create the reference with wax



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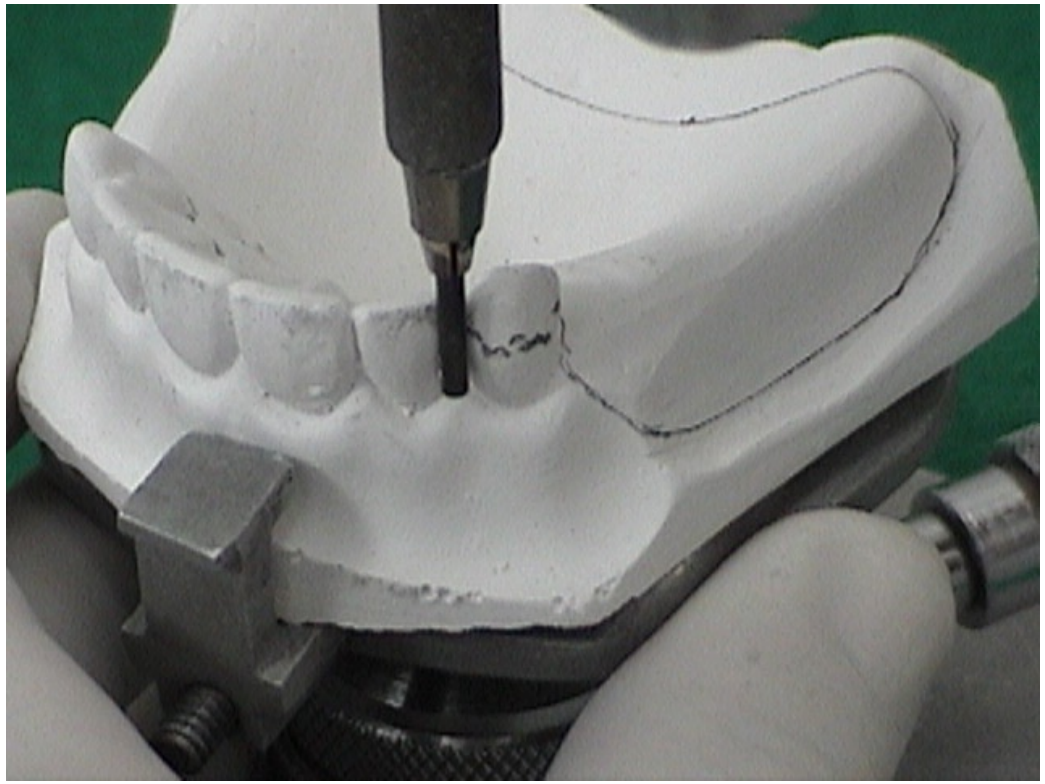
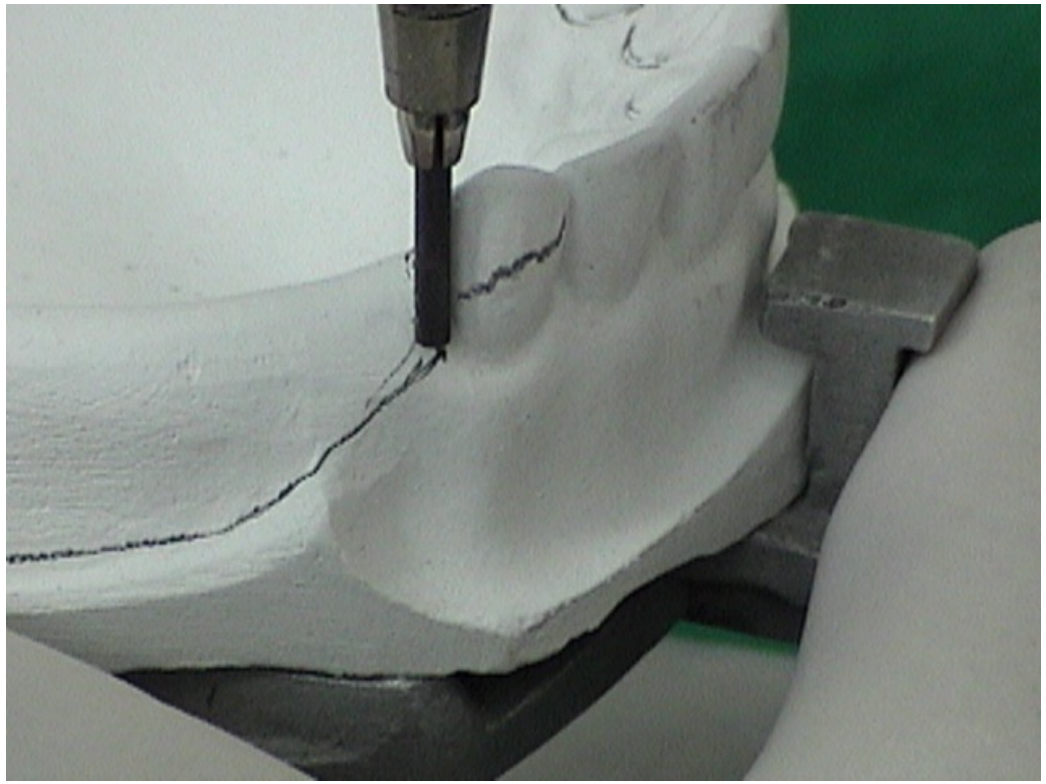
3) Height of Contour





Survey lines of supporting teeth

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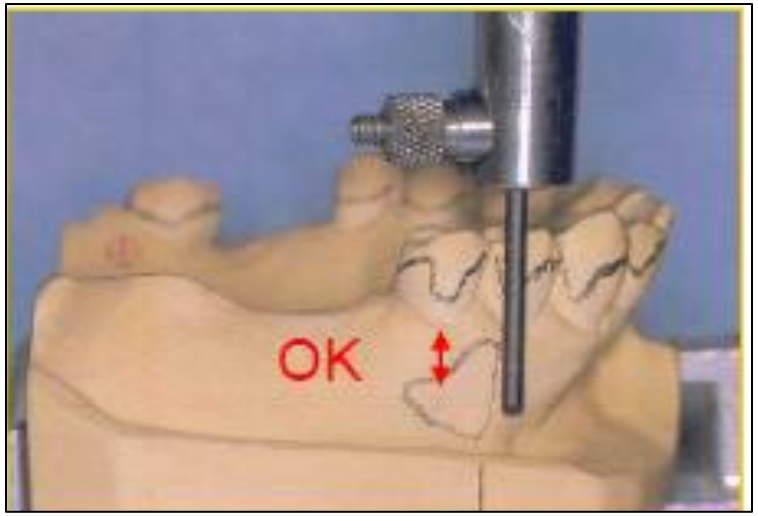
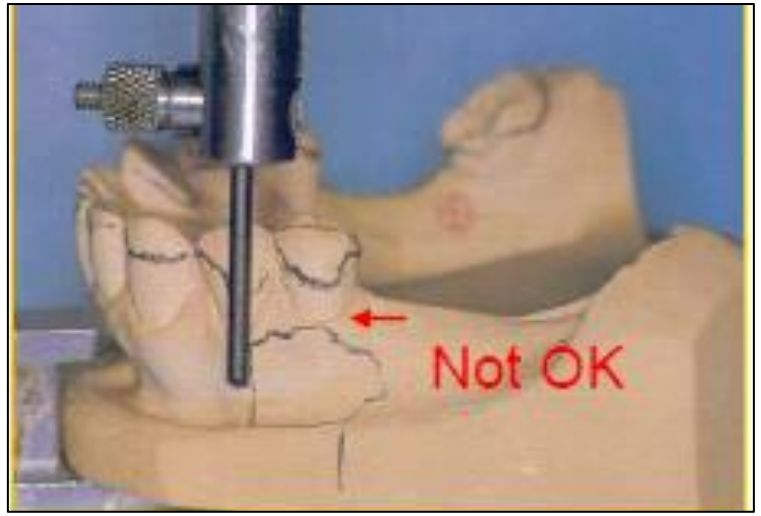
3) Height of Contour

Survey lines of supporting tissues:

The extend of supporting tissue undercuts defines whether an infra-bulge retainer is possible



Infra-bulge retainers:
Desire 3 mm of attached gingivae from free gingival margin to top of the undercut



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3) Height of Contour

Survey lines of supporting tissues:

The extend of supporting tissue undercuts defines whether an infra-bulge retainer is possible

Undercut

Ideal

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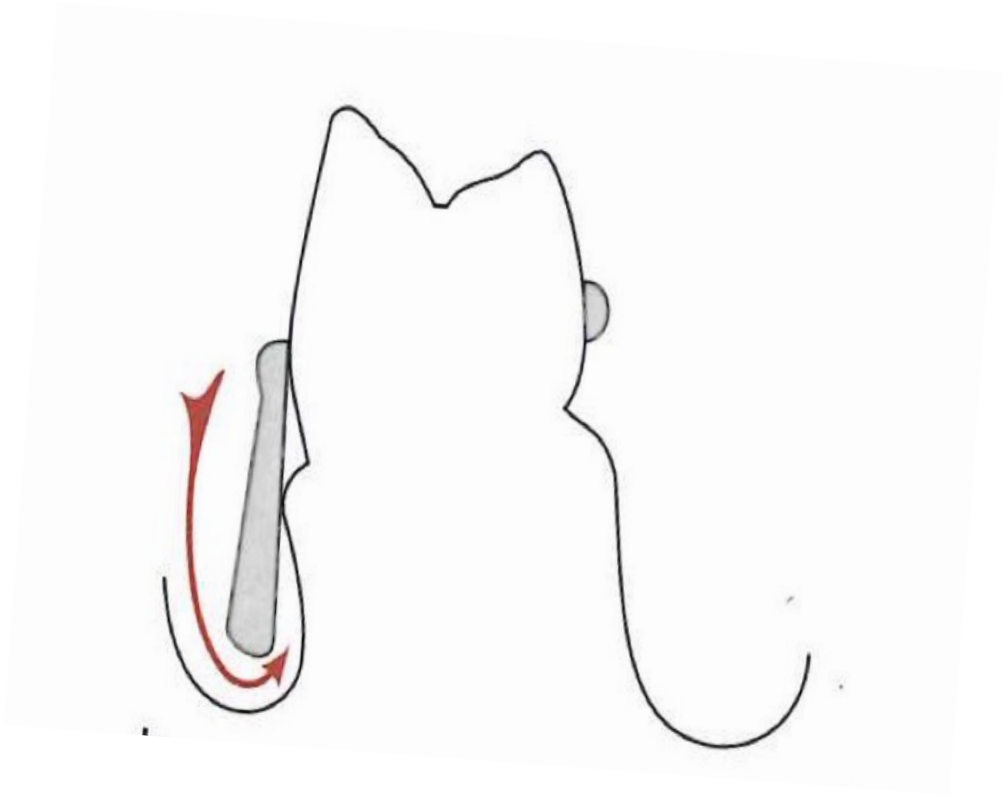
3) Height of Contour

Survey lines of supporting tissues:

The extend of supporting tissue undercuts defines whether an infra-bulge retainer is possible



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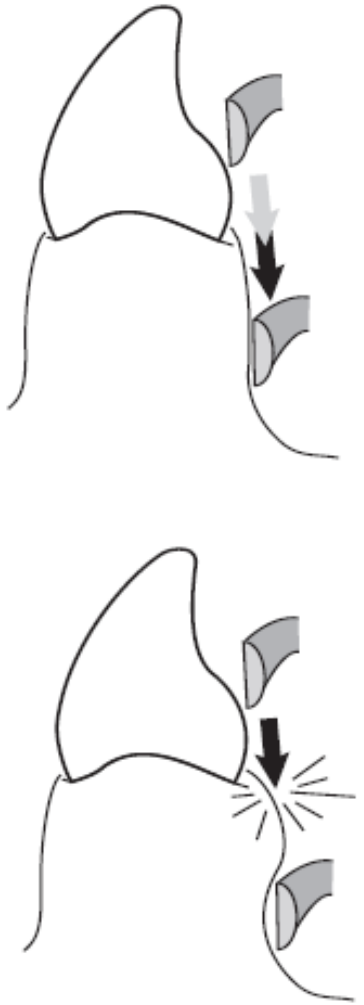
3) Height of Contour



Soft tissues undercuts - bony protuberances that interfere with the seating of the denture base/major connector

- Change POI,
- Use a major connector design that avoids the bulky area
- Pre-prosthetic surgery

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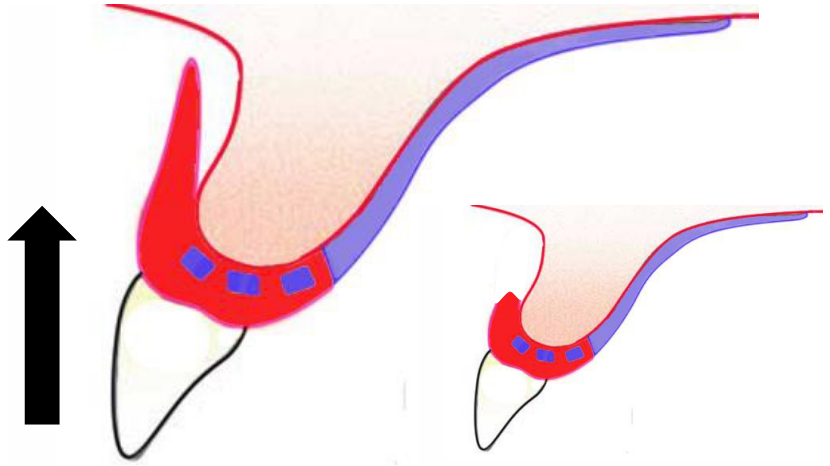
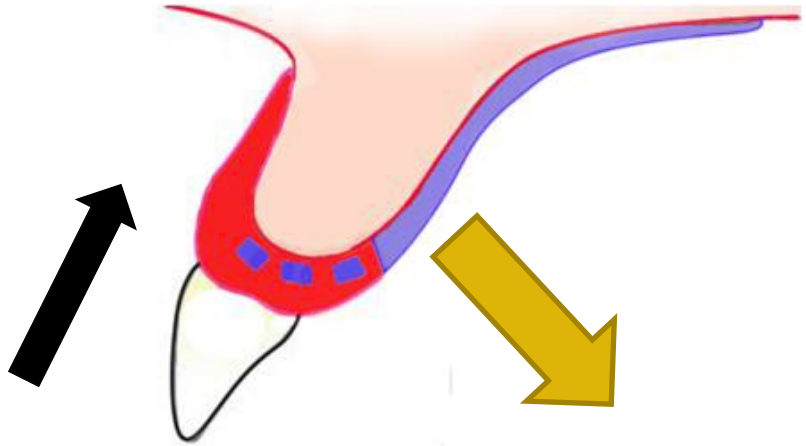
3) Height of Contour

This causes food entrapment and aesthetic issues



Buccal flange not only aid the aesthetics but also assist in the retention and stability of the RPD



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2) Path of Insertion

The final path of placement will be the anteroposterior and lateral position of the cast, in relation to the vertical arm of the surveyor, that best satisfies **retention, guiding planes, interference, and esthetics**.

Convenience technique (Applegate technique)

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2) Path of Insertion

Lateral tilt

Ideal: reasonable retention is balanced out between all the abutment teeth

Before Applegate technique

After Applegate technique

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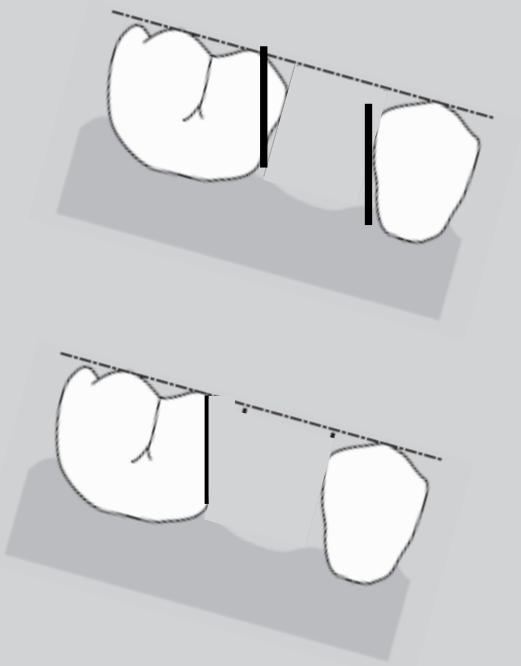
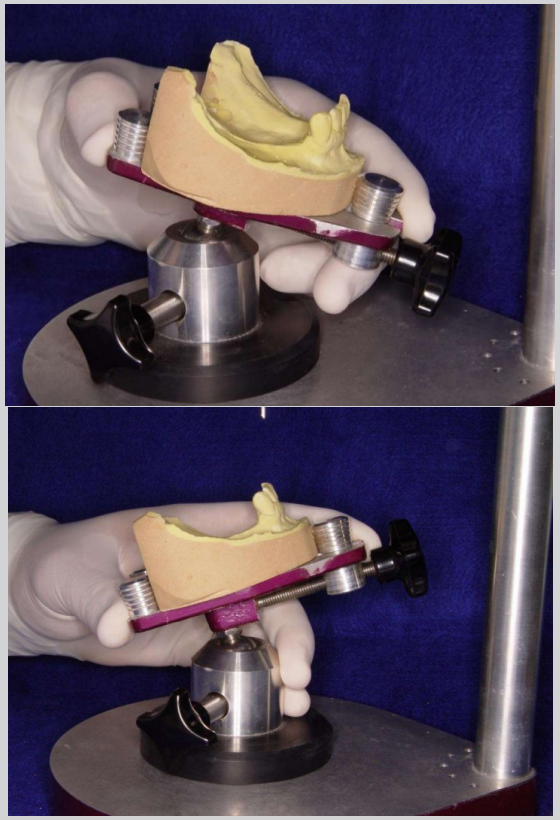
2) Path of Insertion

Anterior-posterior tilt

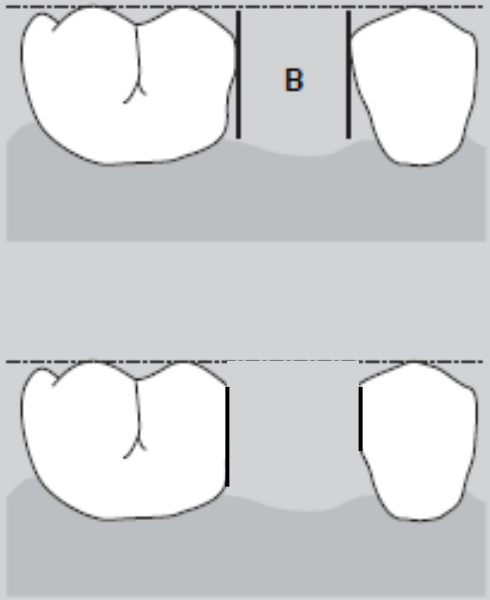
Establish adequate guiding planes, without cutting too much tooth structure

Before Applegate technique





After Applegate technique



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2) Path of Insertion

Record and reproduce the model position

Tripoding the cast

- Procedure that allows **casts** to be placed back on the survey table in the same pre-established orientation (when the framework design was done)

Two methods:

- Horizontal Plane
- Vertical Plane

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2) Path of Insertion

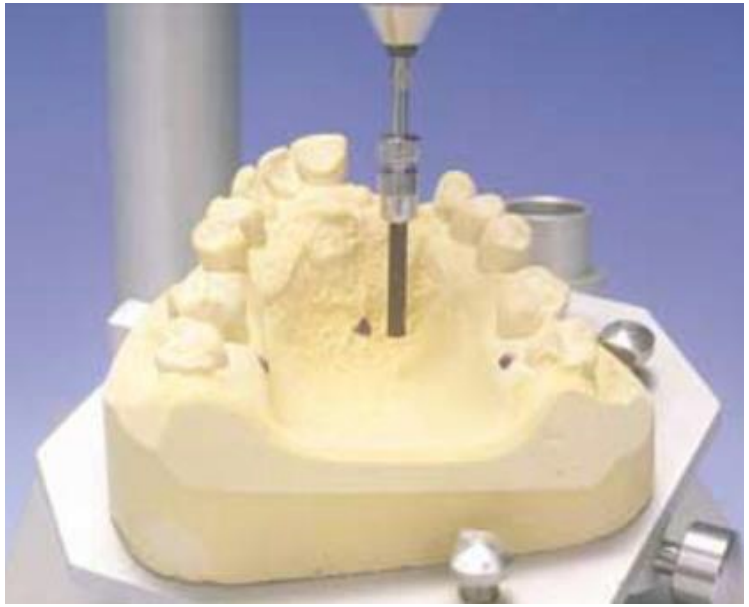
Record and reproduce the model pc

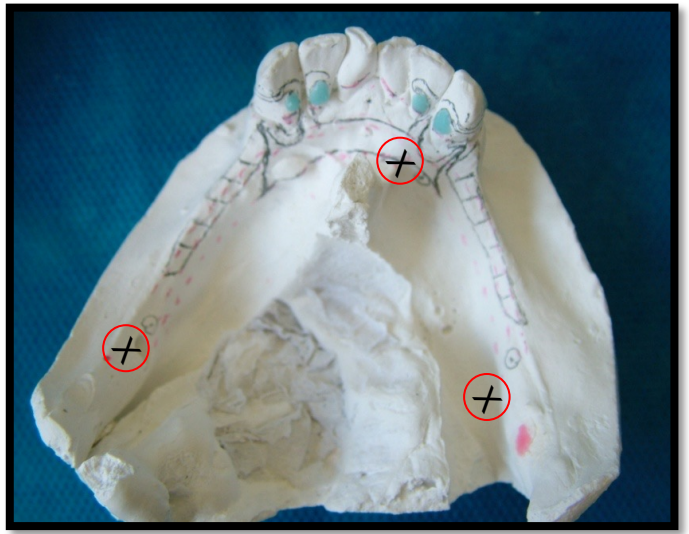
Tripoding the cast

- Horizontal Plane

  - With the vertical arm of the surveyor LOCKED, three wide-spread tissue points are selected in relatively non-critical areas that can be marked for future identification

  - When repositioning the cast, the table is maneuvered until the three points coincide with the vertical arm fixed in a position.





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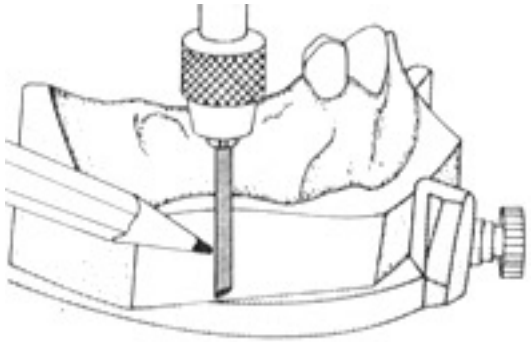
2) Path of Insertion

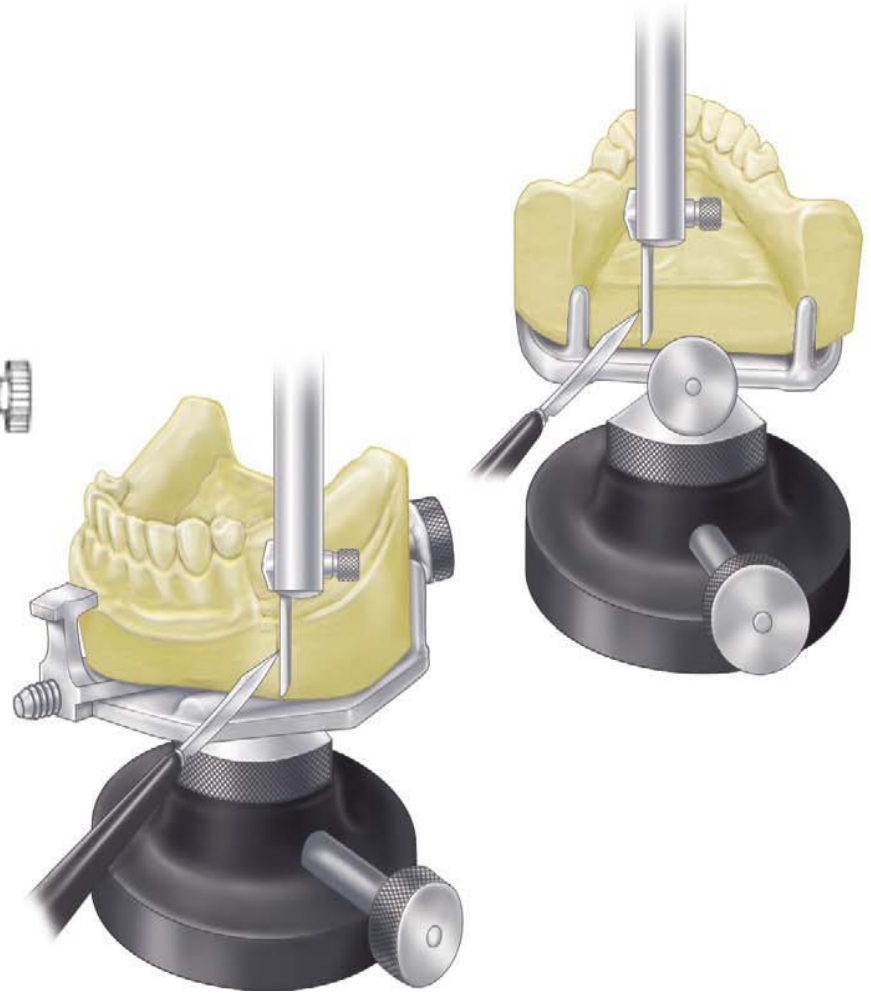
Record and reproducethe model position

Tripoding the cast

- Vertical Plane

- Analysing rod as a guide ruler
- Create three parallel divergent markings on the dorsal and the two lateral sides of the cast.
- These lines can then be used to re-orientate the cast to the original plane





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2) Path of Insertion

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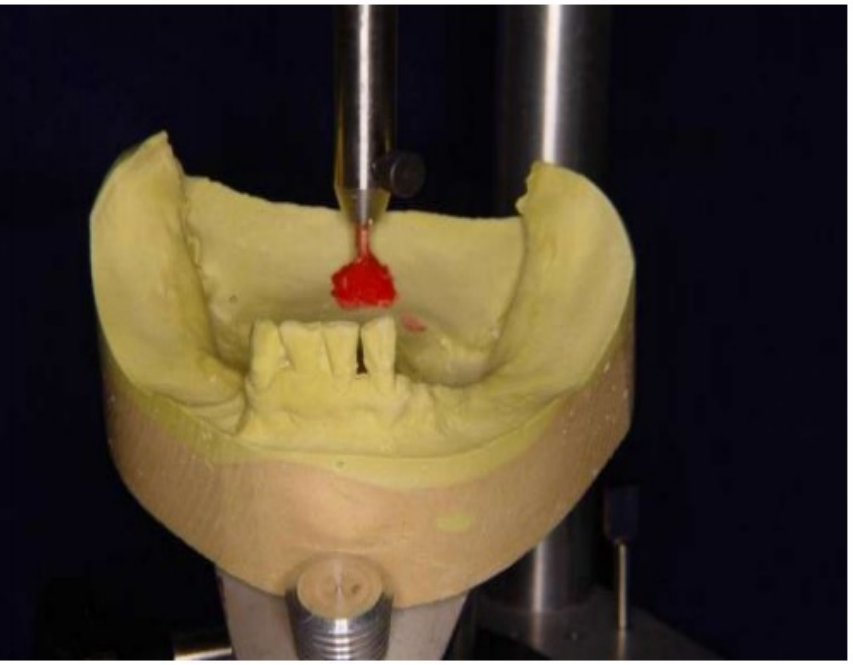

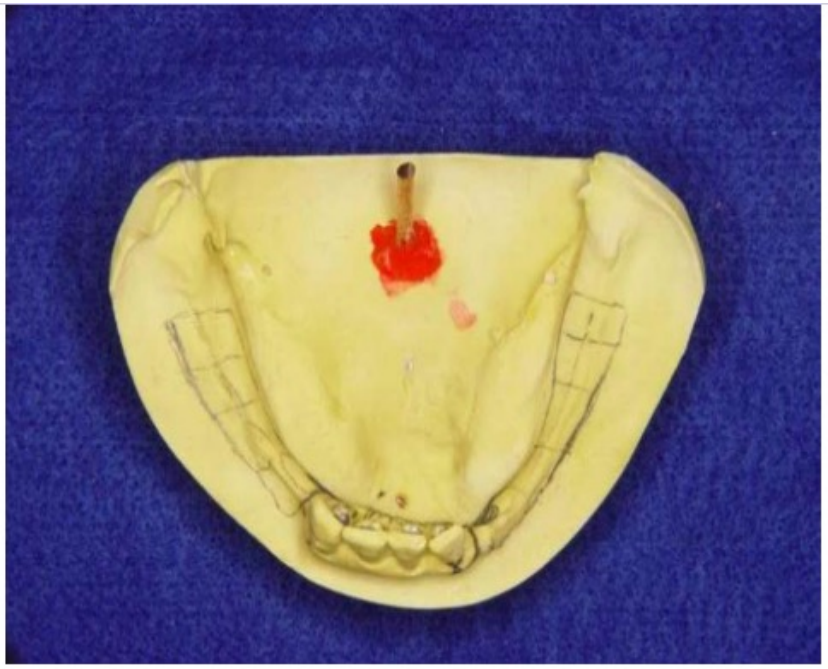

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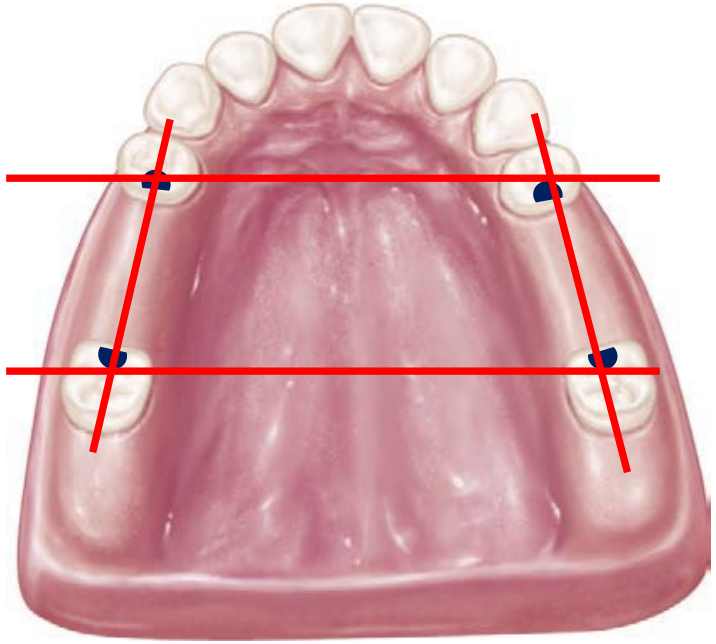
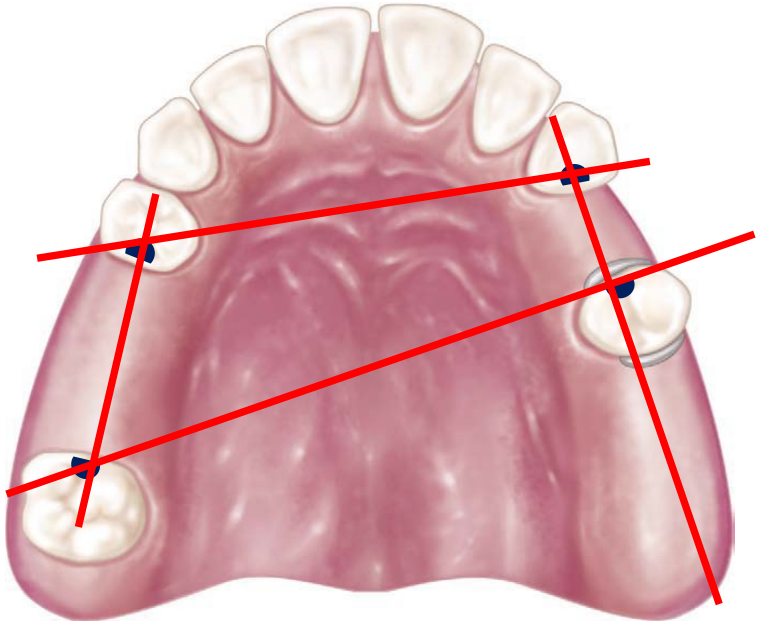
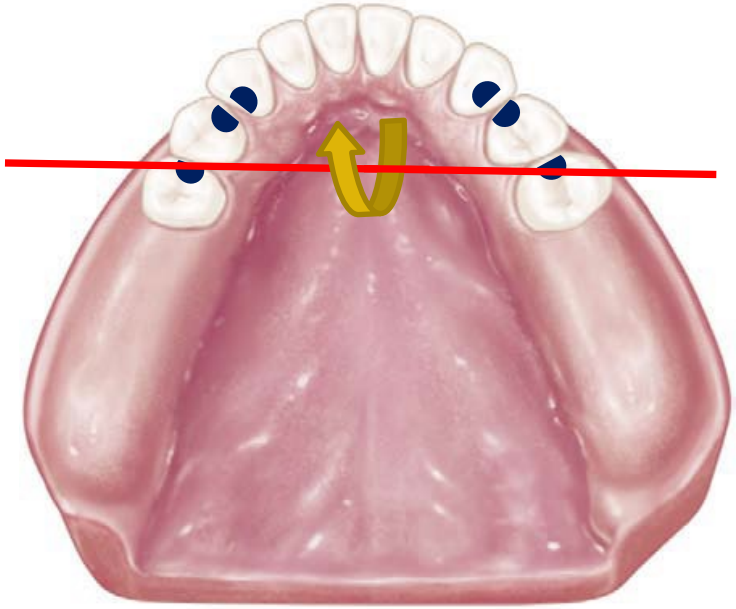
4) Rest position

- Intercalated edentulous area: adjacent to the edentulous area
- Free-end edentulous area: not immediately adjacent to the saddle.







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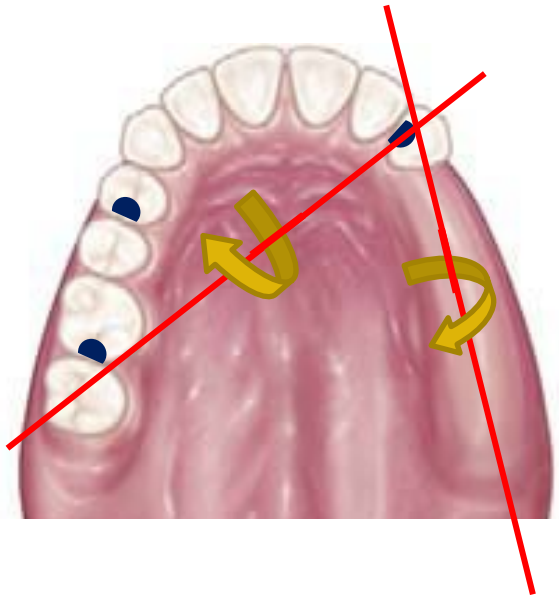
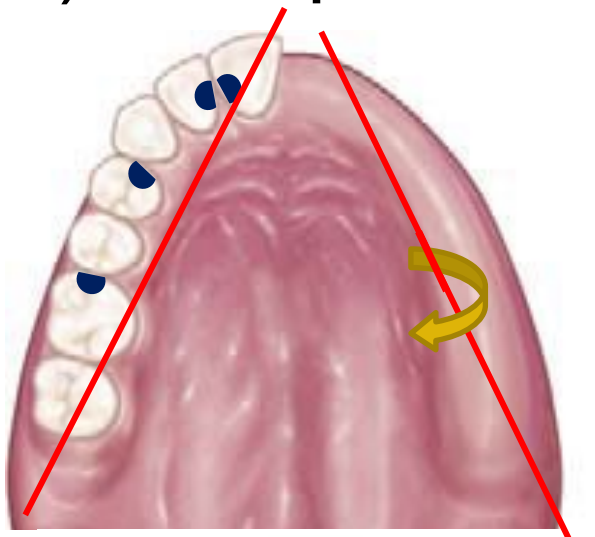
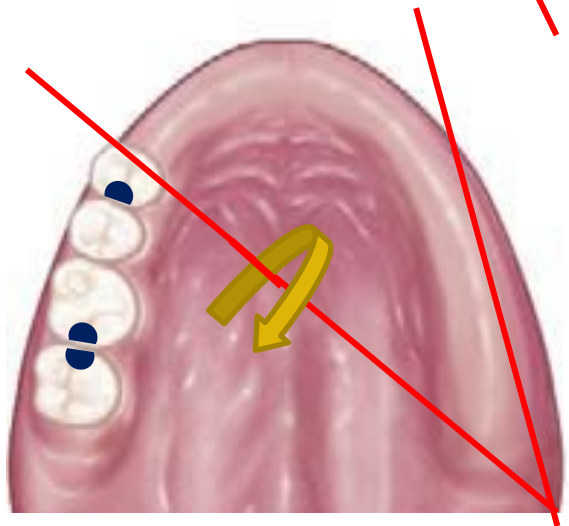
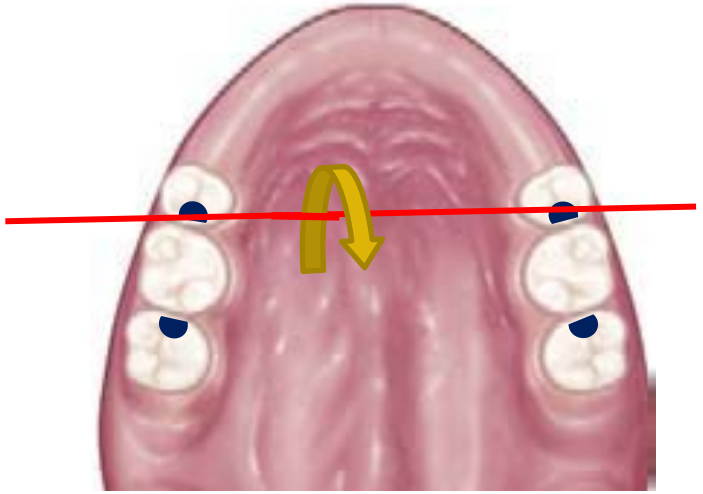
4) Rest position









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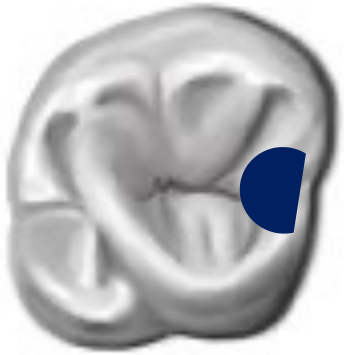
4) Rest position



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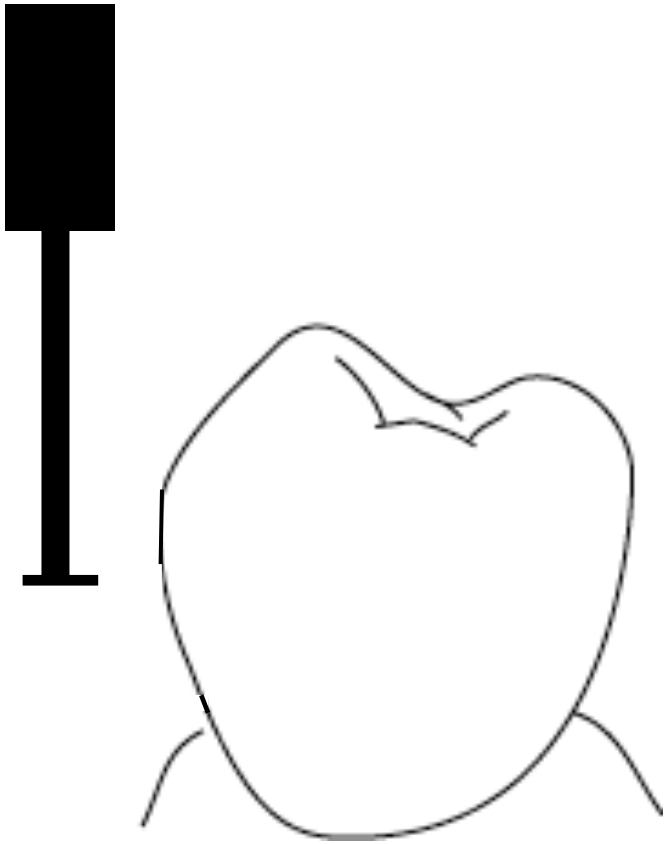
5) Desired undercut

CoCr



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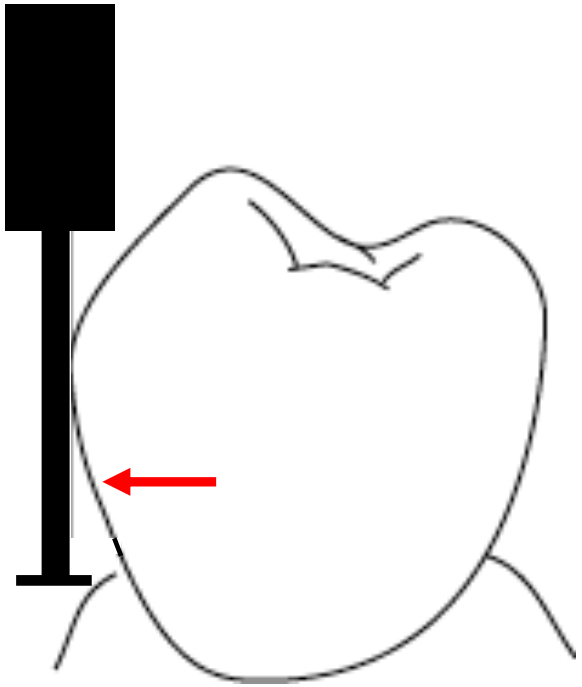
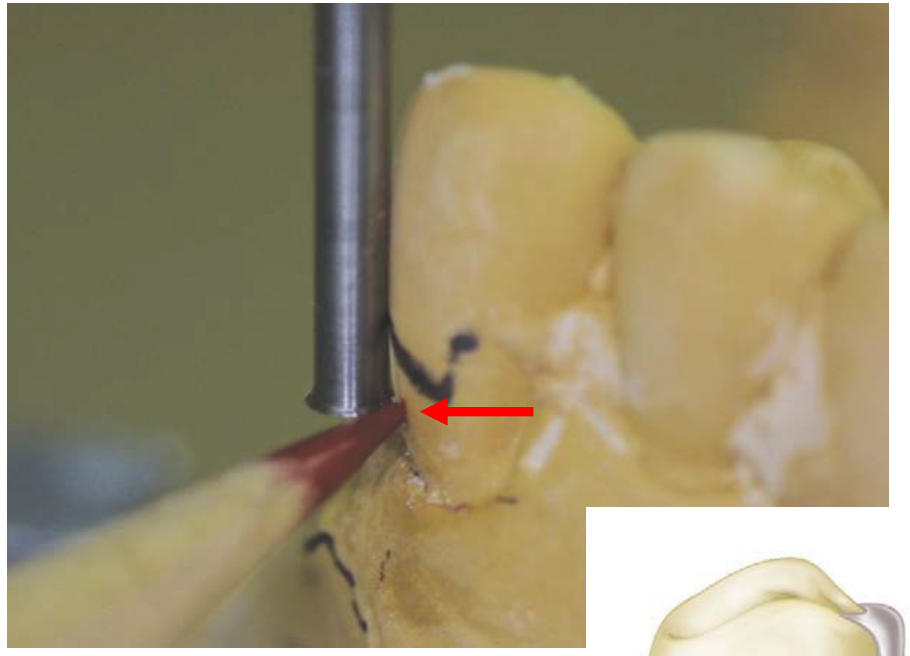
5) Desired undercut

CoCr





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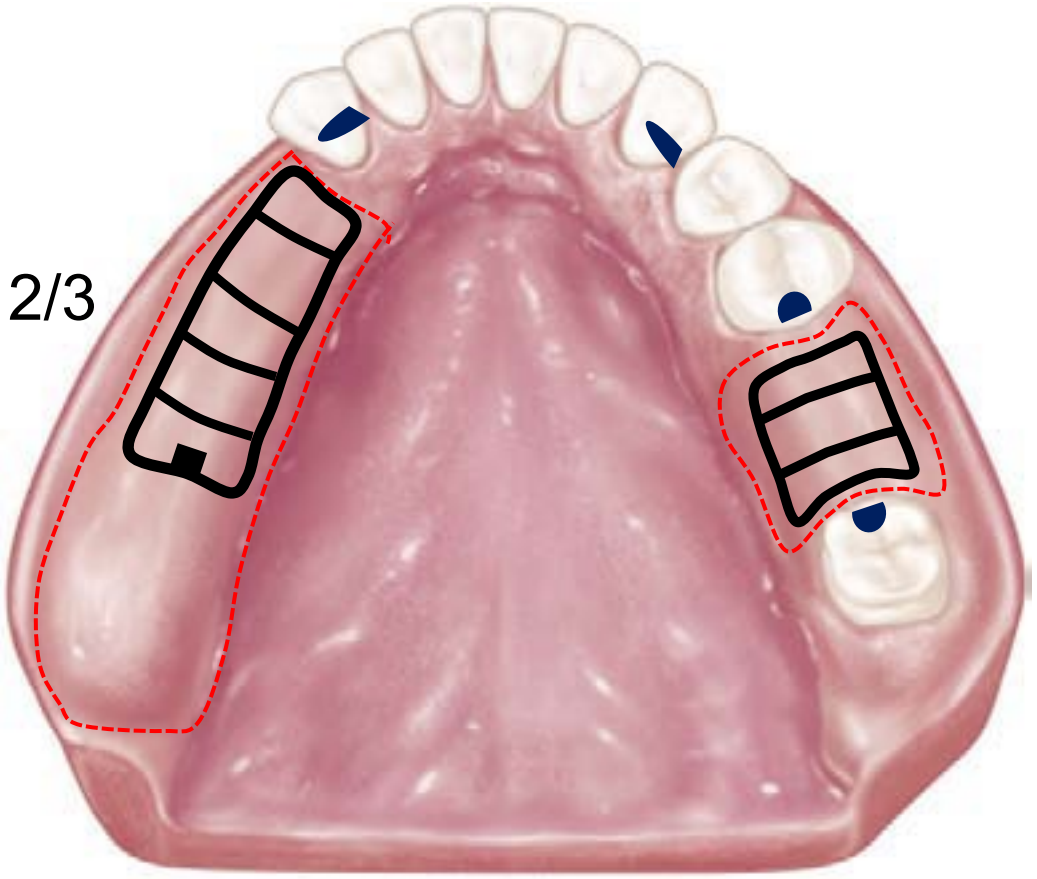
6) Outline of the framework

1° Rests
2° Grid



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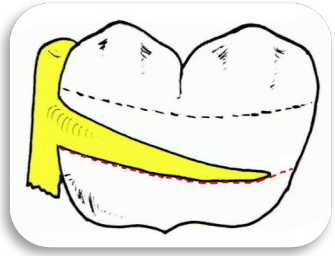
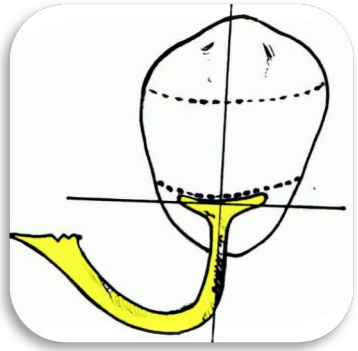
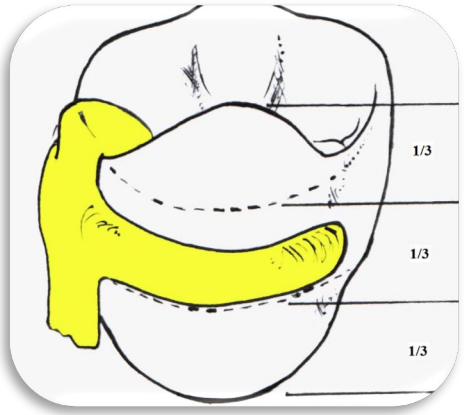
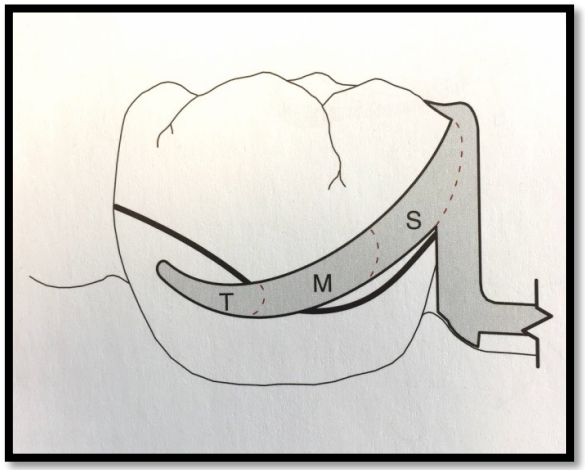
6) Outline of the framework





1° Rests
2° Grid
3° Clasps: retention arm (supra and infra-bulge), reciprocating arm, proximal plate





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6) Outline of the framework

1° Rests

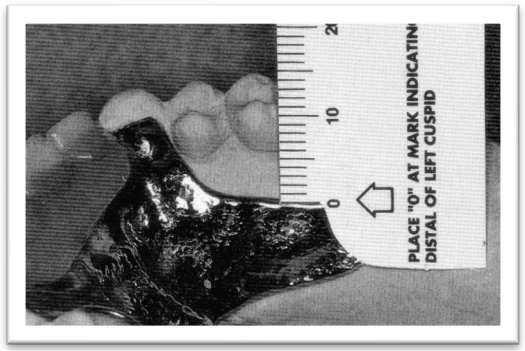
2° Grid

3° Clasps: retention arm, reciprocating arm, proximal plate

Supra and infra-bulge

4° Major connector:

- Mandibular denture: 3 – 4 mm from gingival margin and floor of the mouth
- Maxillary denture: 5 – 6 mm from gingival margin and avoid torus and soft palate



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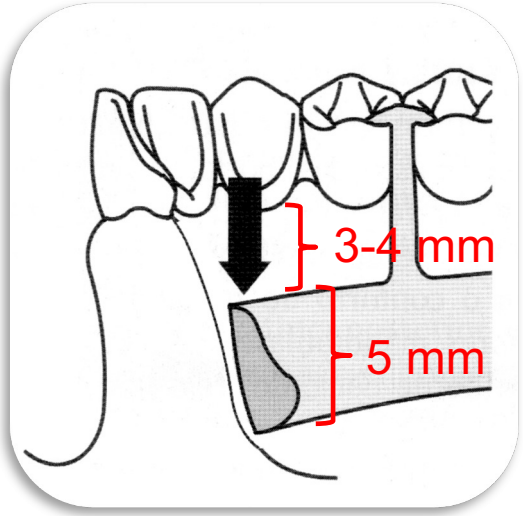
6) Outline of the framework

4° Major connector:



- 8 mm: Strap – can be thinner, flat
- < 8 mm: Bar – need to be bulky

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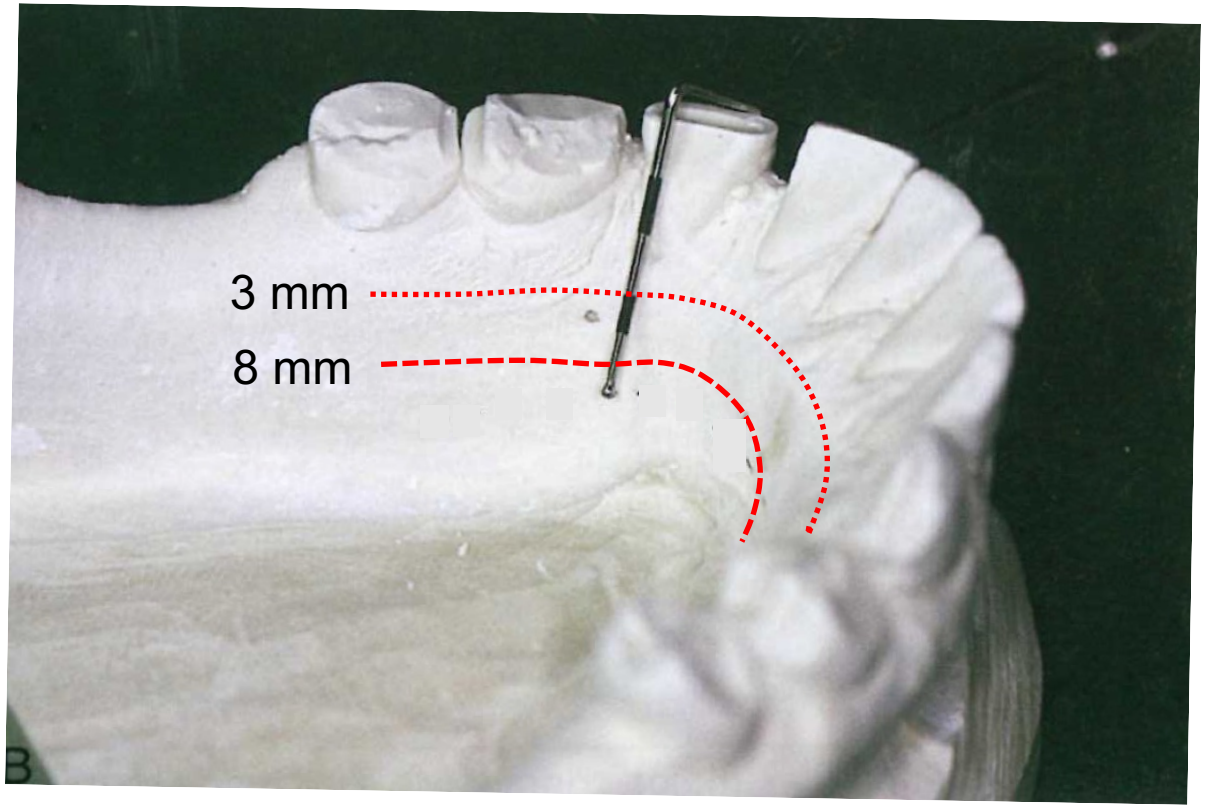
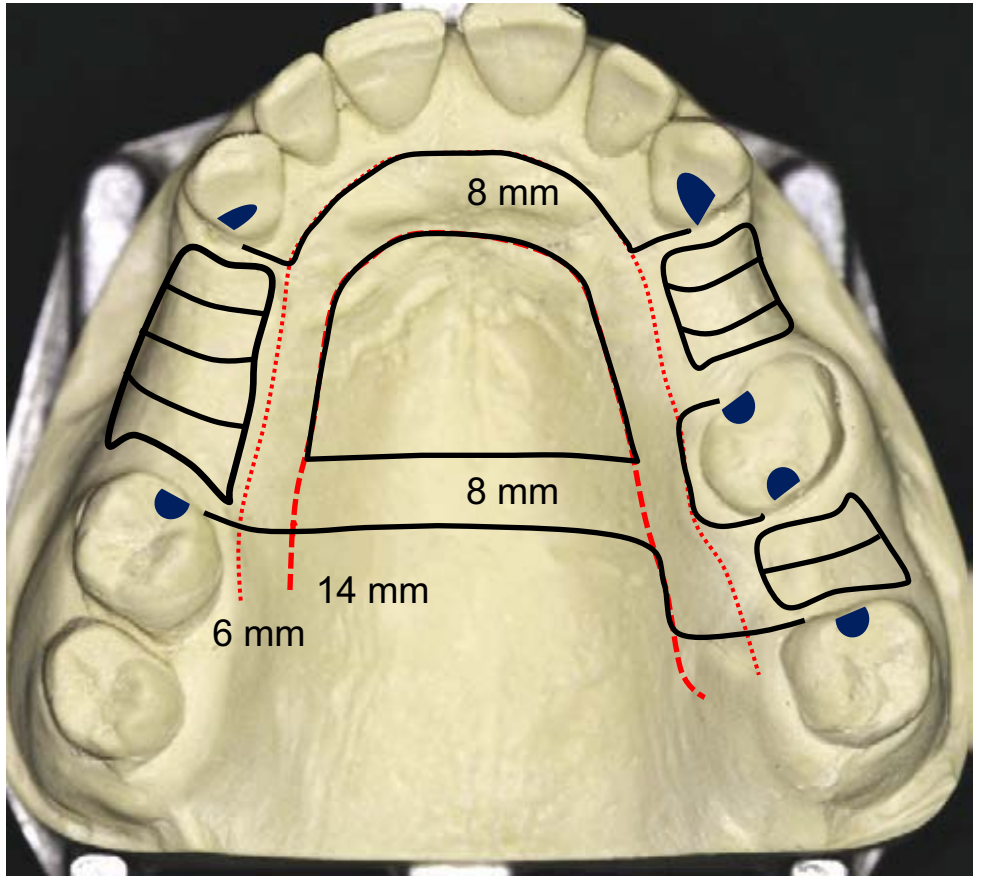
6) Outline of the framework

4° Major connector:





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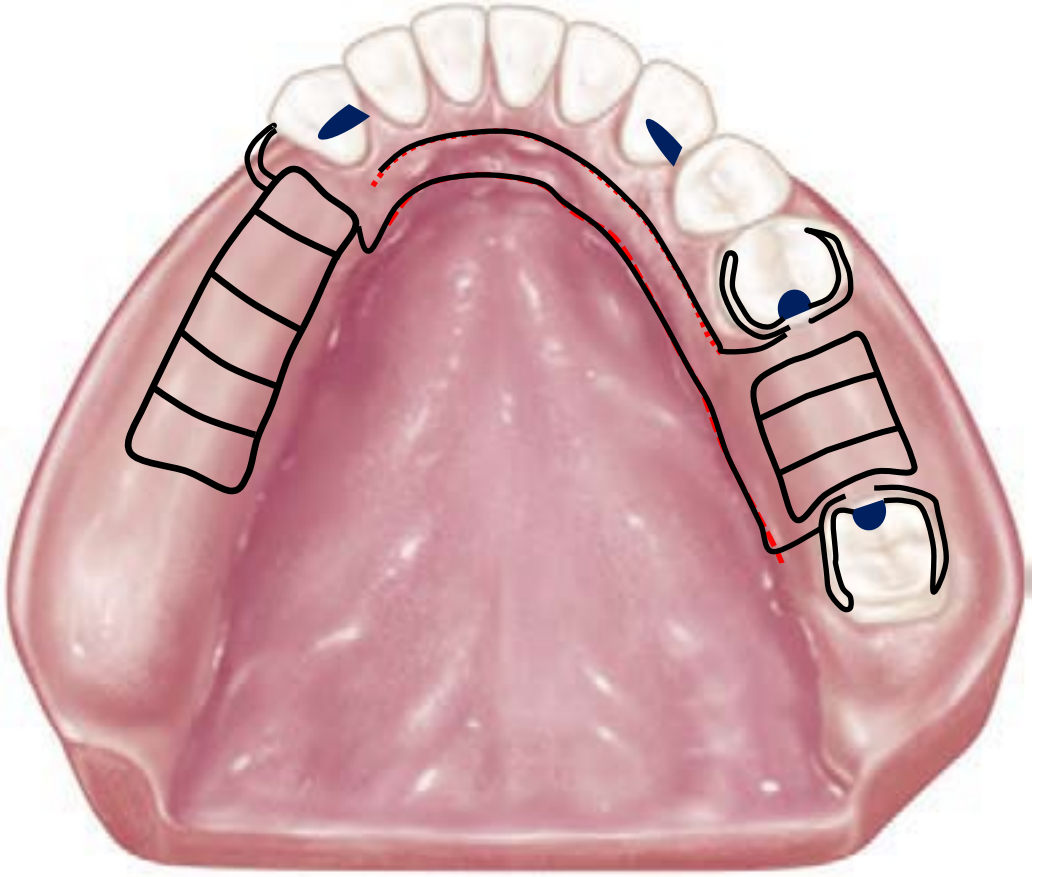
6) Outline of the framework

4° Major connector:



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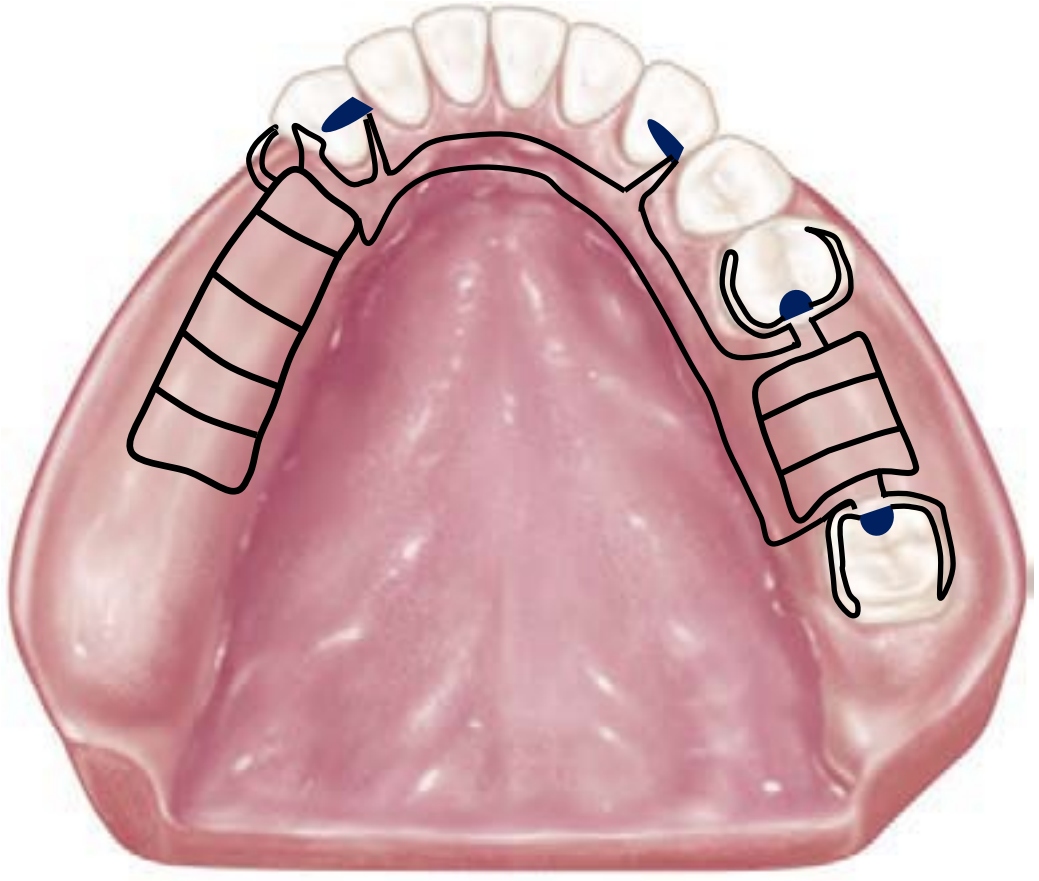
6) Outline of the framework

1° Rests
2° Grid
3° Clasps
4° Major connector
5° Minor connector



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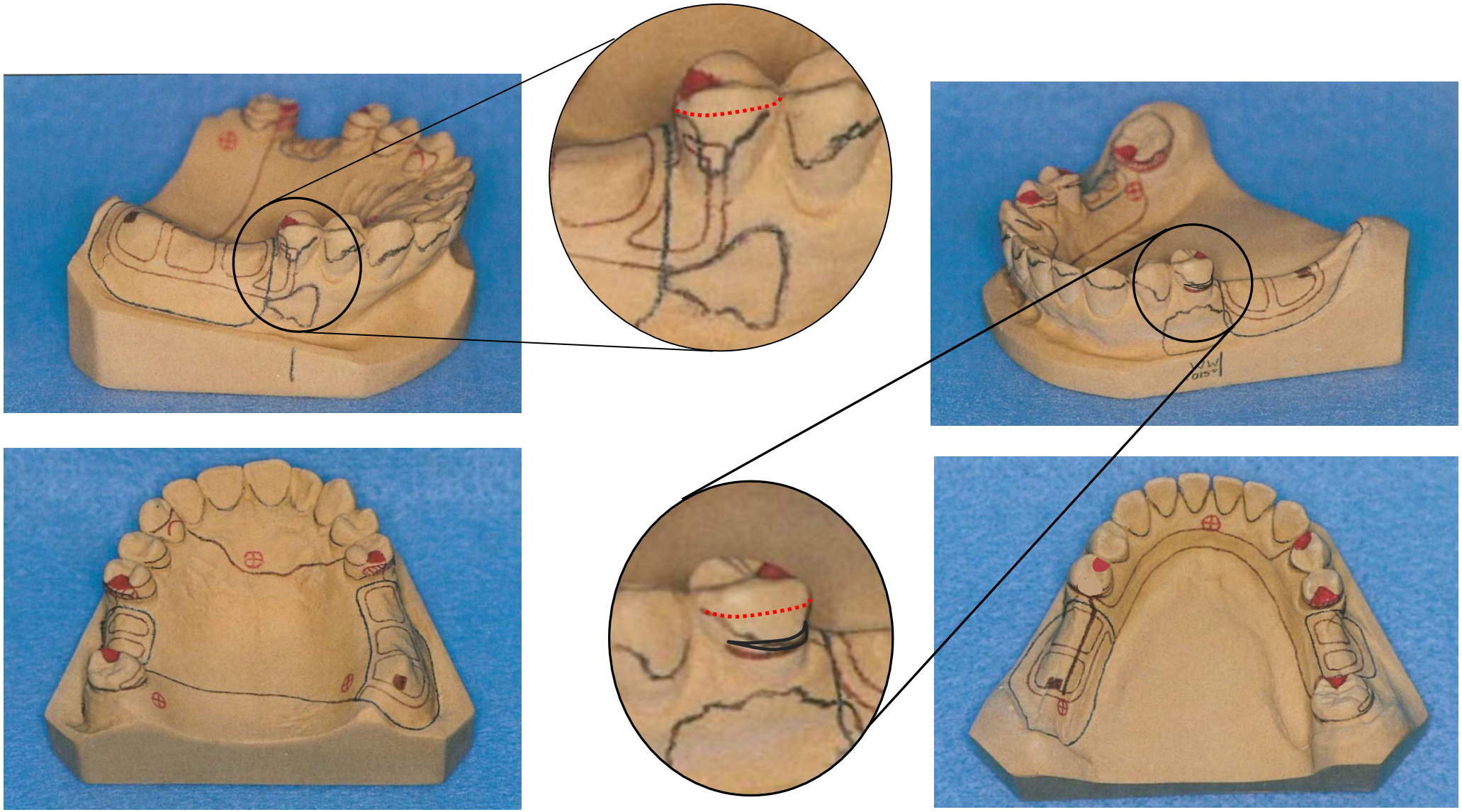

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7) Adjust the height of contour and create guiding planes

Aim

All reciprocating arm is above the height of contour

1/3 of the retention arm in undercut

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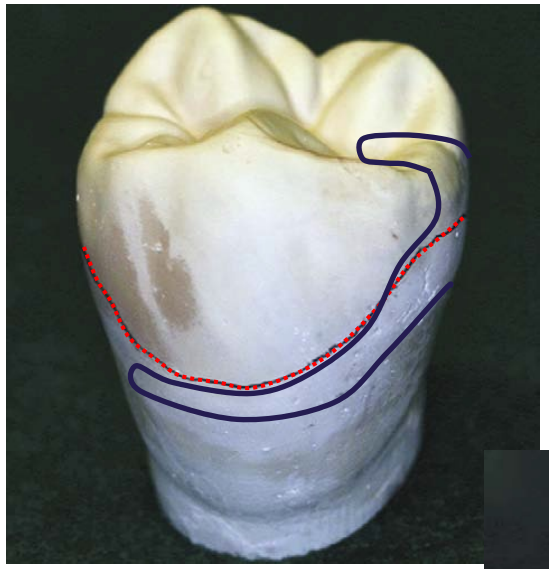
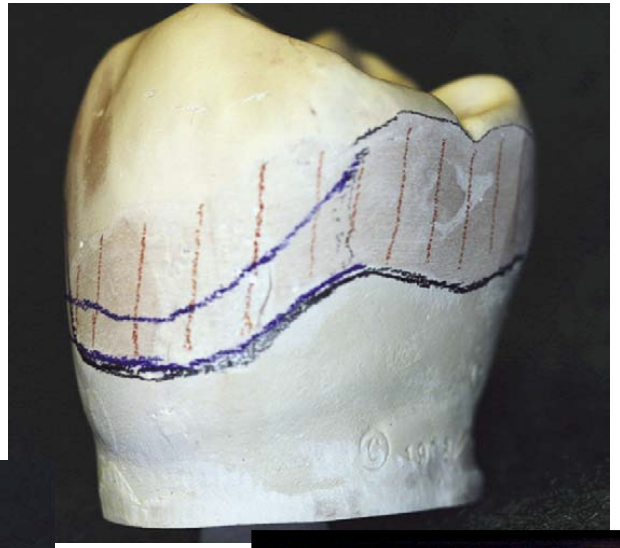
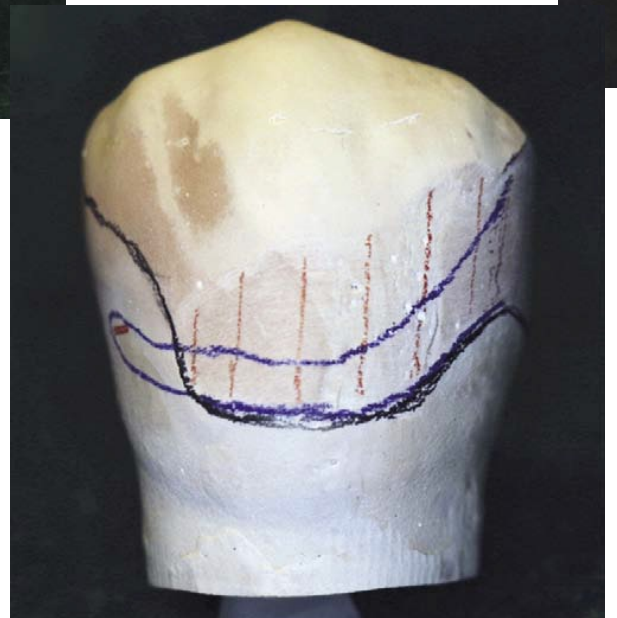
7) Adjust the height of contour and create guiding planes

Modifying height of contour







Surveyor blade

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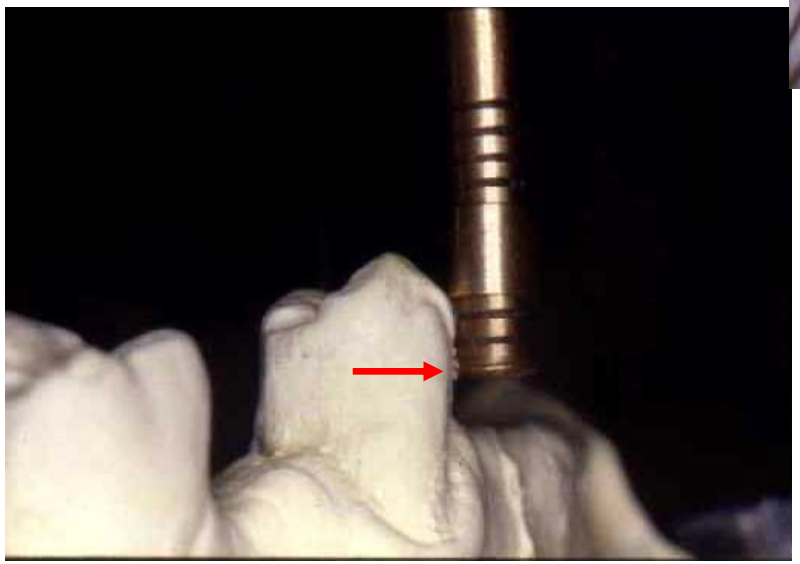
7) Adjust the height of contour and create guiding planes

Modifying height of contour



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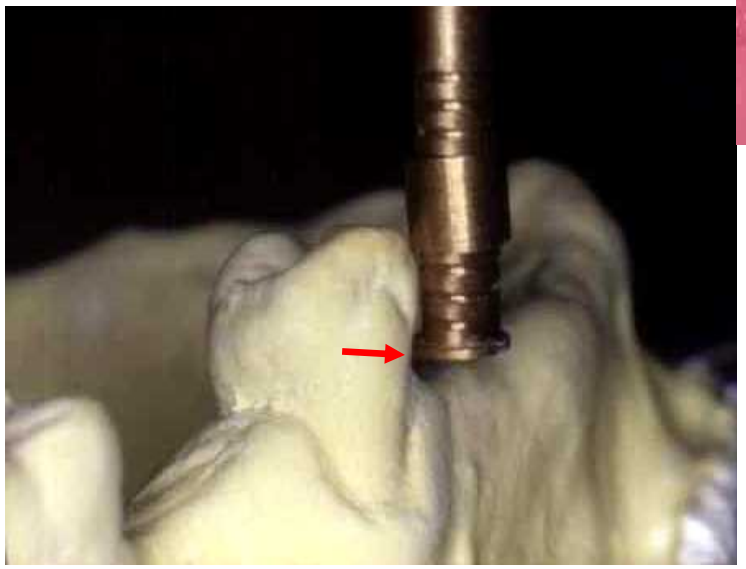
7) Adjust the height of contour and create guiding planes

Modifying height of contour



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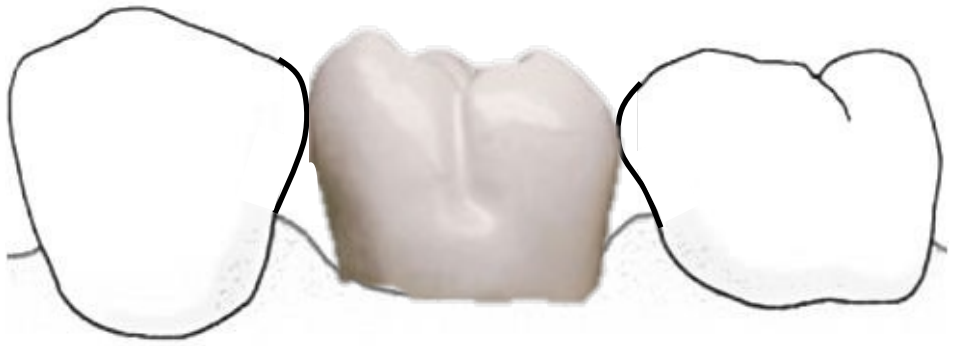
7) Adjust the height of contour and create guiding planes

Guiding planes

- The natural bulge of the tooth needs to be flattened by preparation
- Provide a *single path of Insertion (POI)*
- Limits the instability of the RPD
- Reduce food impaction
- Dentine exposure



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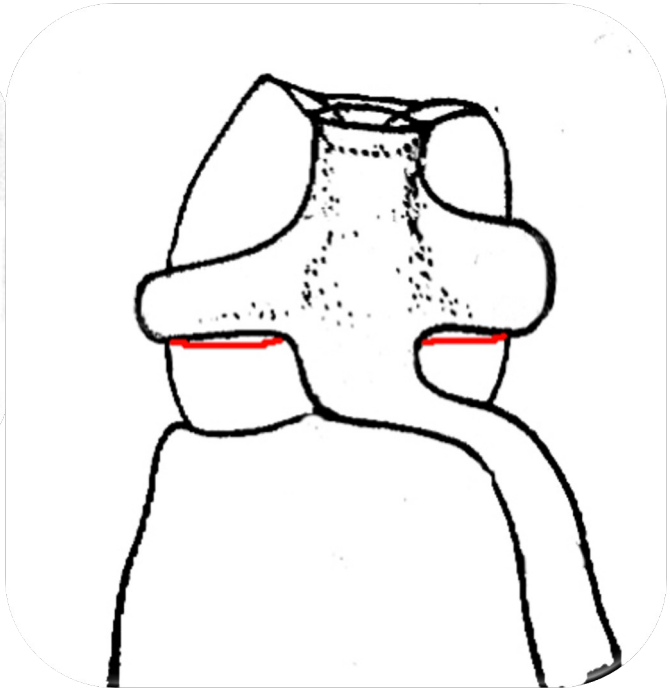
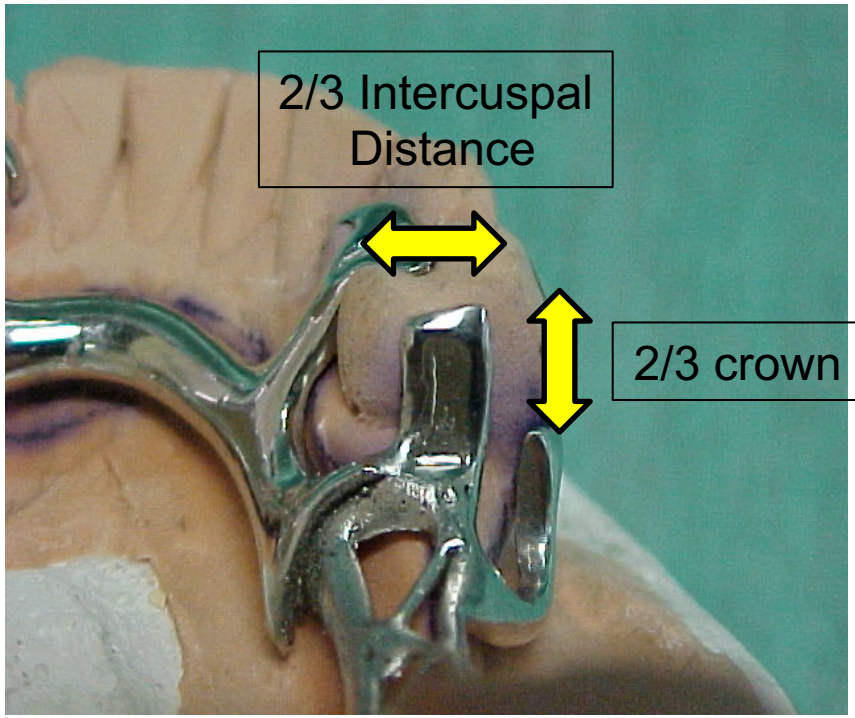
7) Adjust the height of contour and create guiding planes

Clasp Body



Proximal Plate



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Thank you!