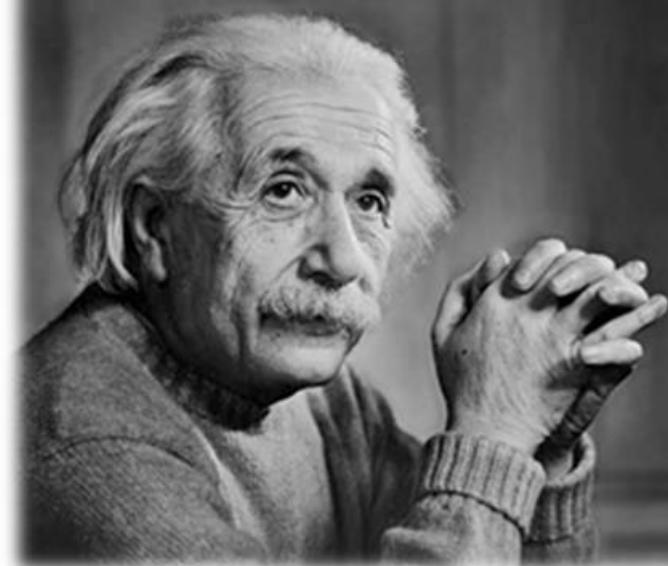


REMOVABLE PARTIAL DENTURES: INTRODUCTION

If you can't explain it **simply**, you
don't understand it well enough.

– Albert Einstein



I CAN
EXPLAIN
IT TO YOU BUT I CAN'T
UNDERSTAND
IT FOR YOU!

avid

/'avəd/

adjective



-having or showing a keen interest in or enthusiasm for something.

synonyms: keen, eager, enthusiastic, ardent, passionate, zealous, hard-core.

antonym: apathetic.



Patience



...loading

Removable Partial Dentures

- Definition and applications
- Classifications
- Surveying

RPD INDICATIONS:

**When FPDs are not a good choice
due to:**



- a. Long edentulous spans, in accordance with Ante's Law.
- b. Lack of a posterior abutment (distal extension)
- c. Structurally and anatomically compromised abutments
 - Absence of adequate periodontal support
 - Poor axial length /retention potential of abutments
- d. Expected survival / value - cost

The periodontal ligament area of the abutment teeth should be equal to or greater than that of the teeth to be replaced.

- RPDs are challenging due to the presence of teeth.
 - Caries, Tooth Wear, Changes in Tooth Positions, VDO Changes, Occlusal Plane Discrepancies, Stability of Occlusal Contacts, Loss of Posterior Support, Esthetic Compromises

Many factors are not under our control as they are in complete dentures. There are always compromises.



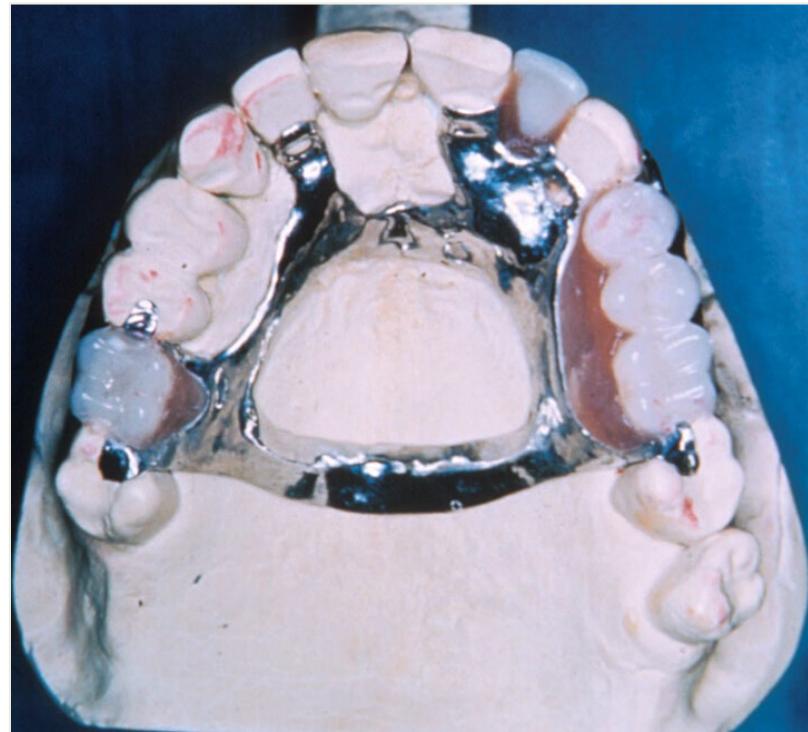
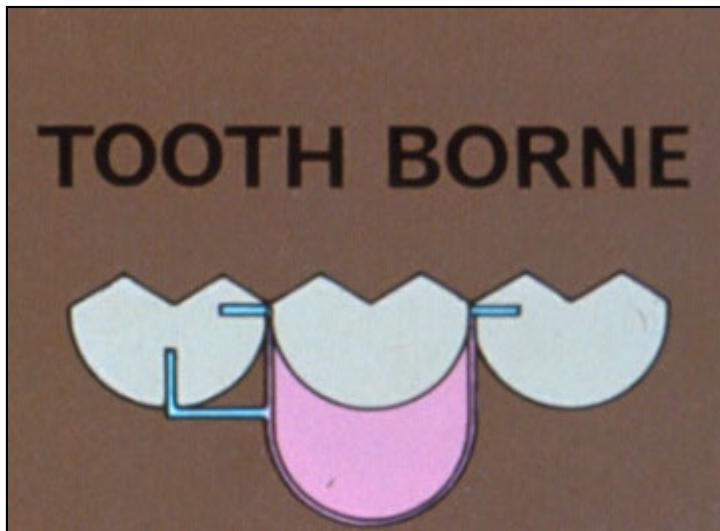
There are two different classes of RPDs. They function very differently biomechanically and have varying levels of complexity, depending on how they are supported.

Supported by:

- Teeth i.e. *Tooth Supported* , or
- Teeth & Mucosa i.e. *Extension Bases****

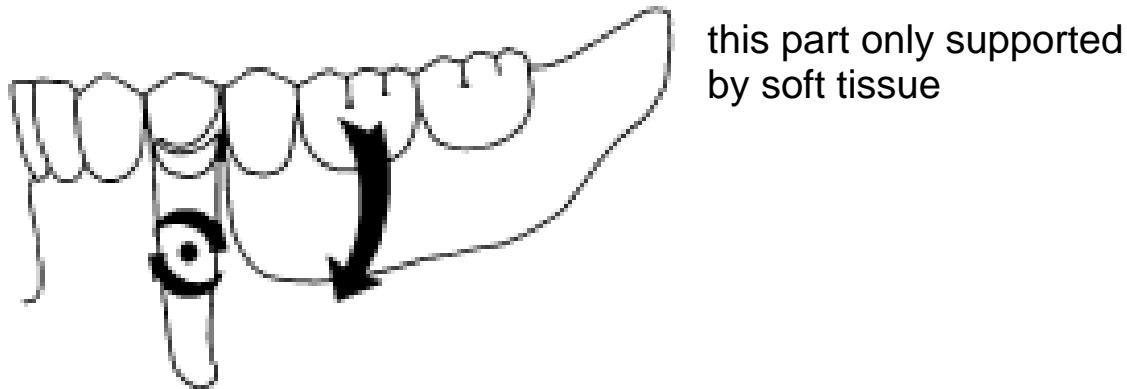
Tooth-supported RPDs

- Abutment teeth limit all edentulous areas.
- Functional forces are transmitted from RPD to abutment teeth, abutment teeth to bone.
- Minimal movement.



Tooth/tissue-supported RPDs:

Distal extension RPDs



There is a differential displacement under occlusal function between teeth and soft tissue, but denture must act as single unified restoration.

The difference between physiologic movement of teeth (0.2 mm) and soft tissue (1.0 mm) under occlusal function is significant.

This presents a completely different level of complexity, in planning and fabrication.

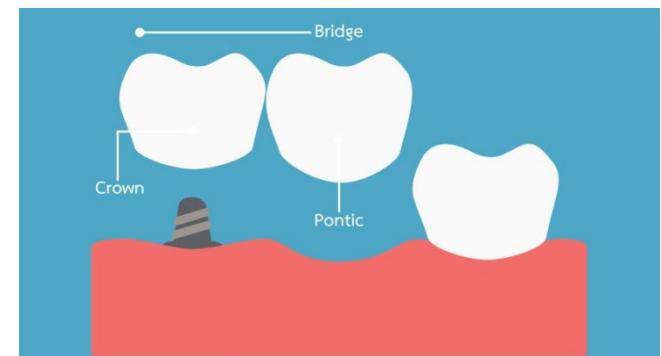
- **Cantilever**



- **Cantilever bridge**



- **Cantilever dental bridge**



Partially Edentulous Arch Classifications

Types of RPDs:

The classification conveys important functional differences

Cl III and IV* are tooth-supported and do not rely on soft tissue for support, stability, or retention.

(* in most cases)

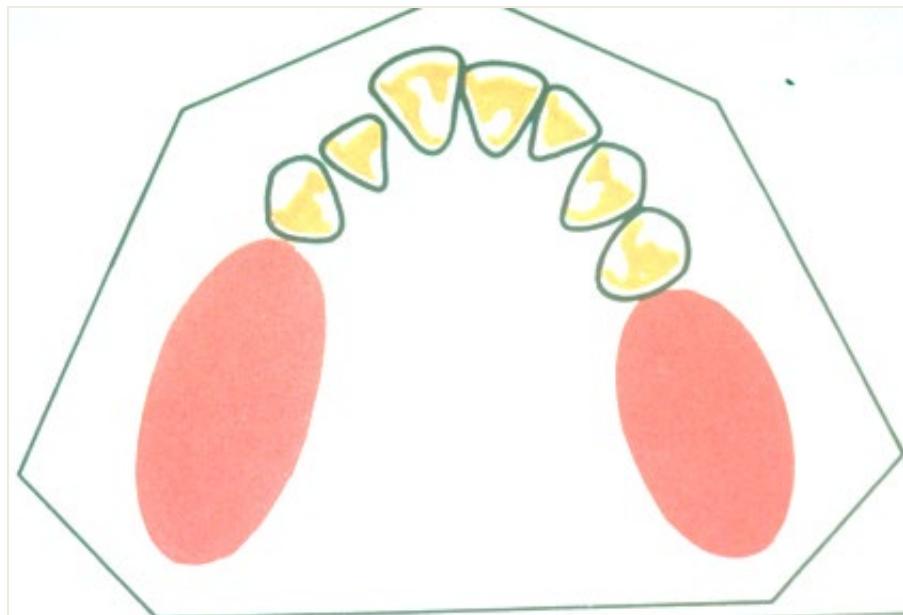
Cl I and II are also soft-tissue supported with distal extensions. SSR have both tooth and soft tissue contributions.

Classes of Removable Partial Dentures

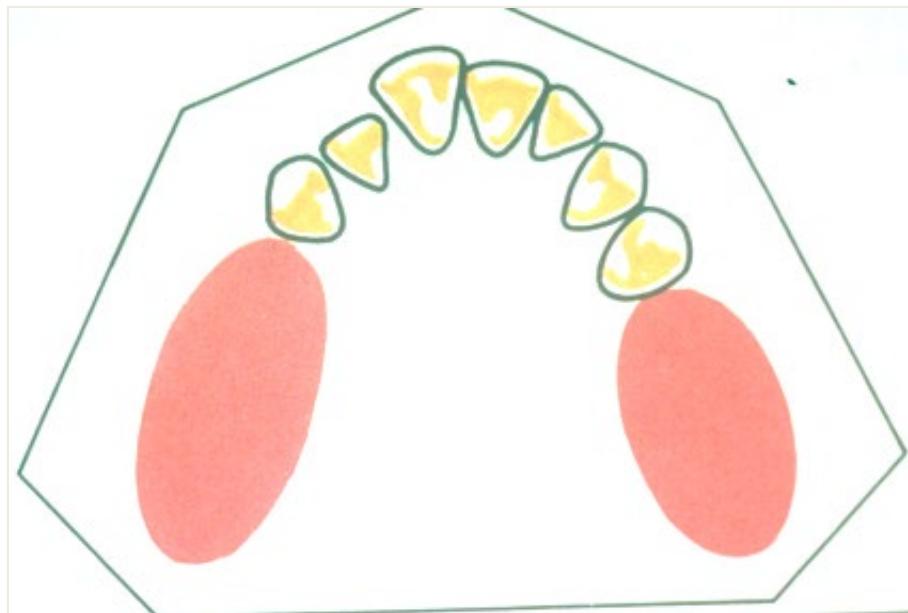
Kennedy-Applegate Classification (know these):

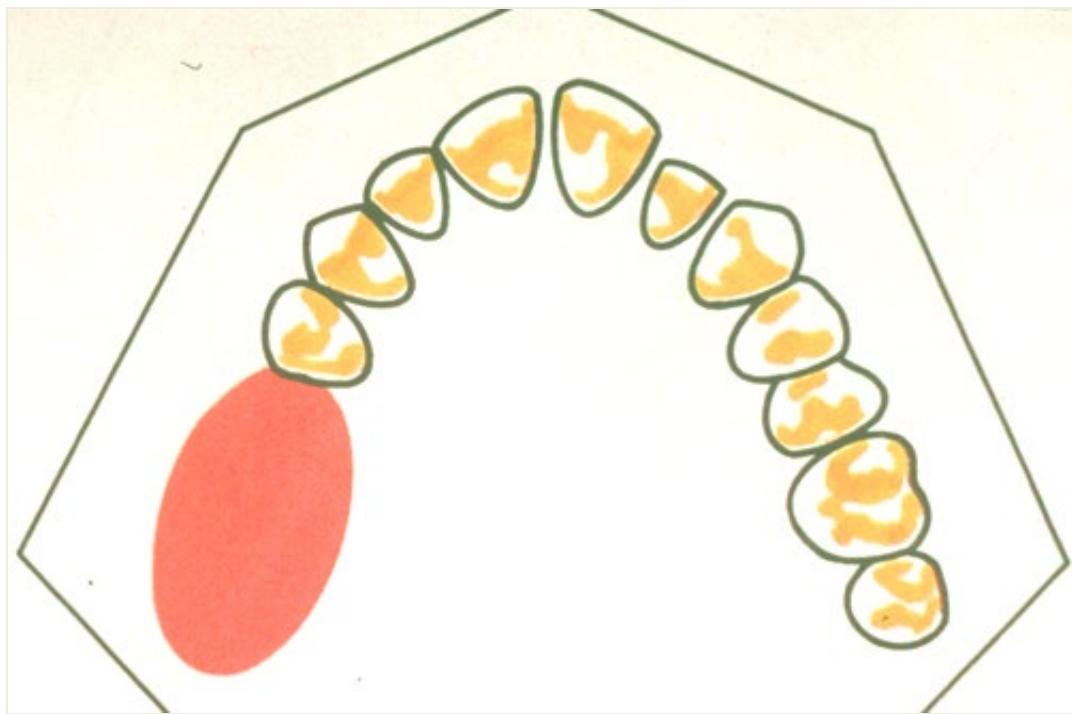
Rules:

- most posterior space names the classification
- additional spaces are modifications

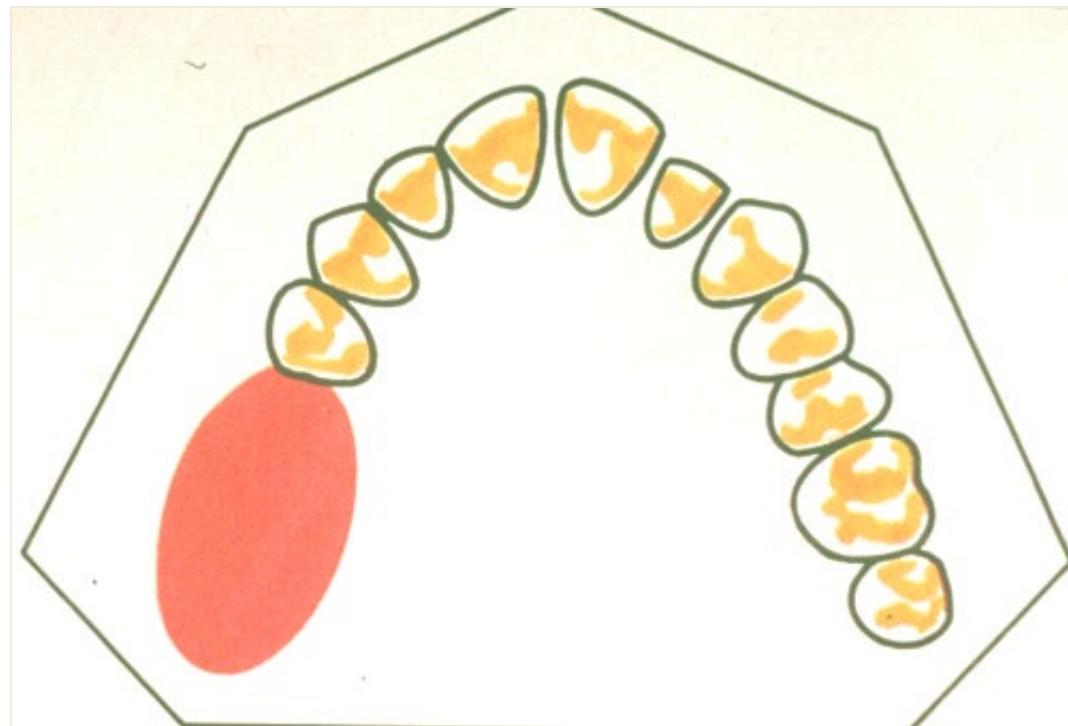


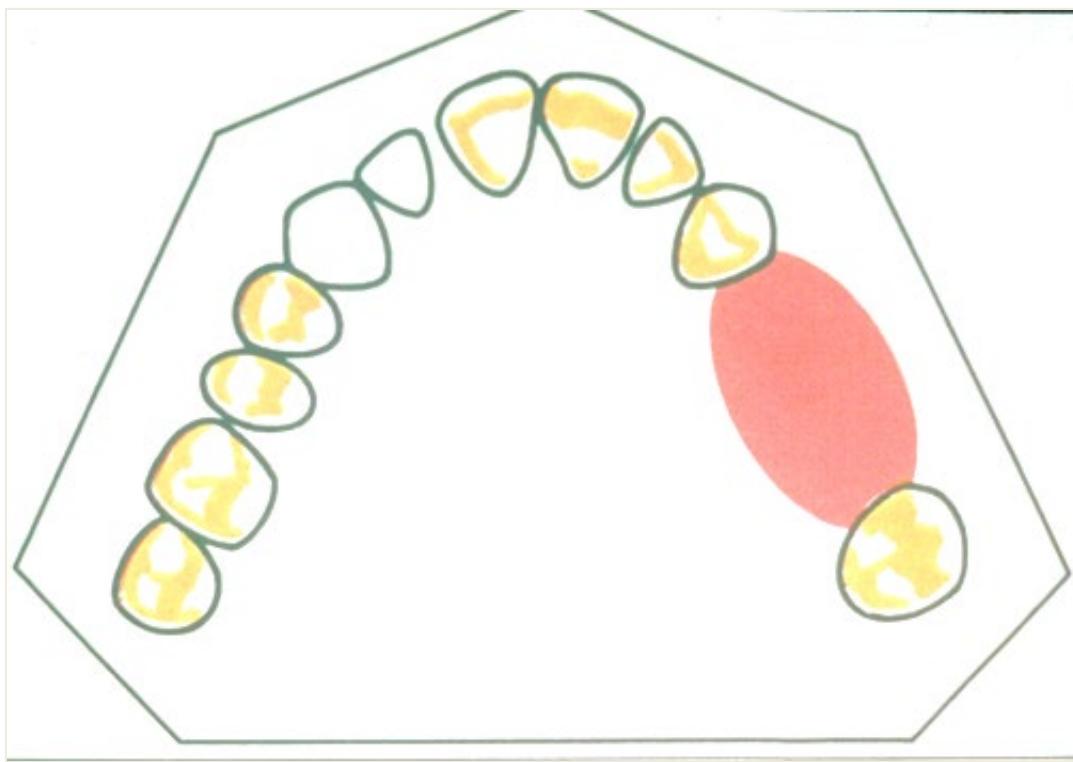
Class I-
Bilateral edentulous areas located posterior to
remaining natural teeth



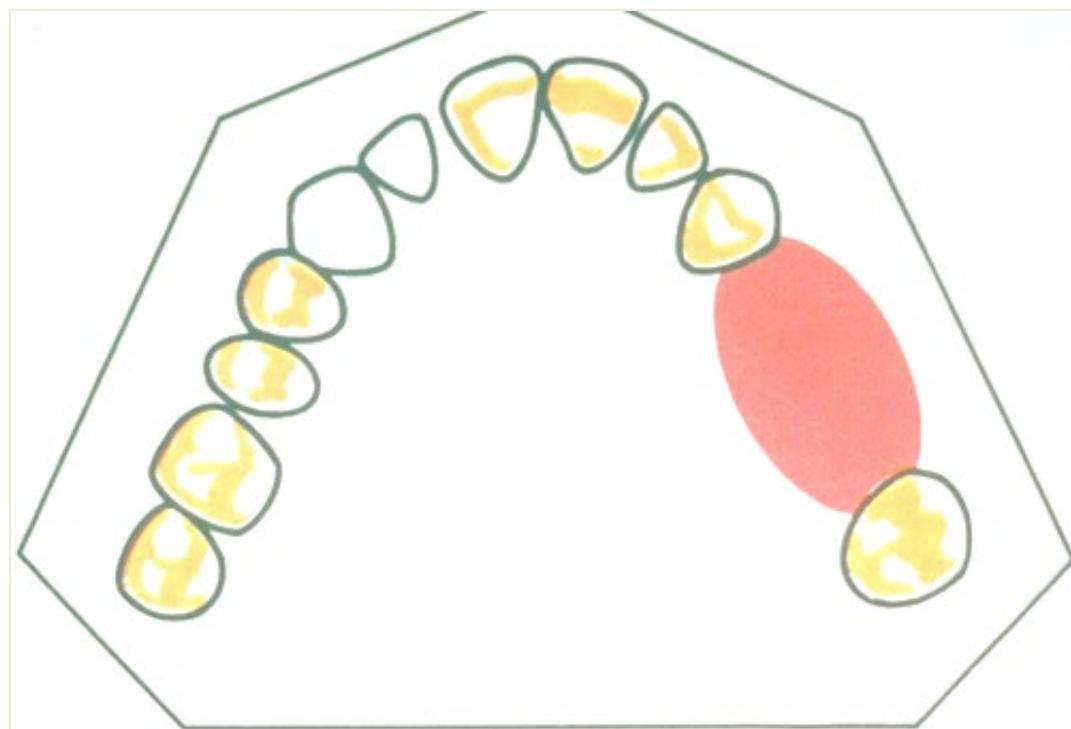


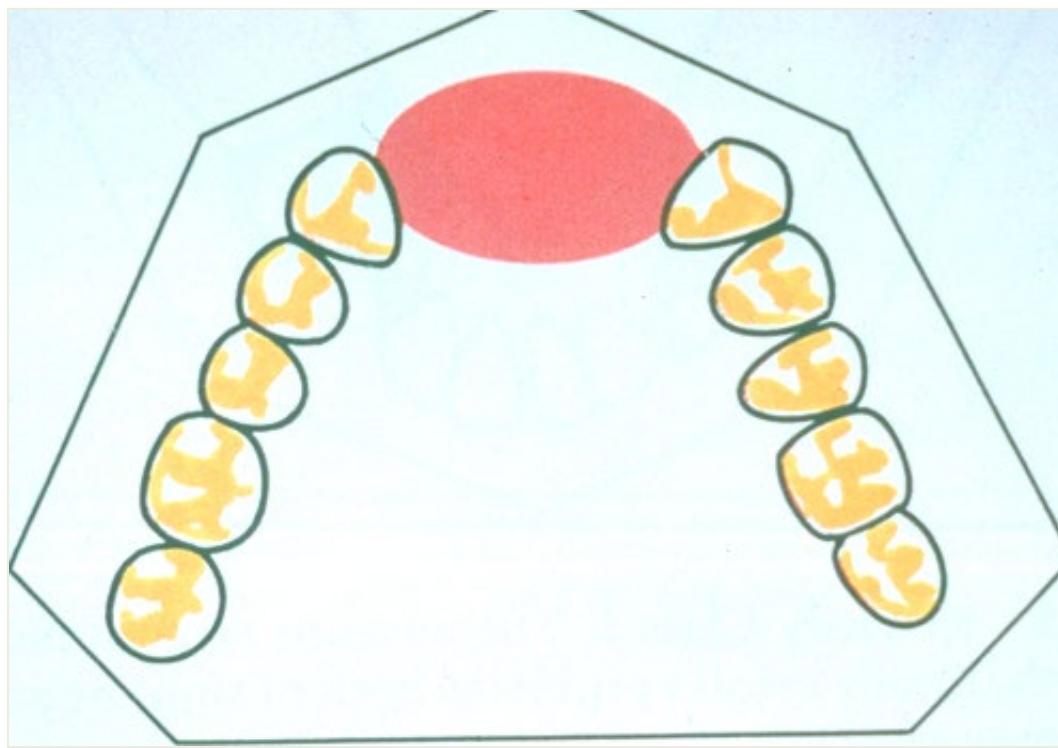
Class II-
**Unilateral edentulous areas located posterior
to remaining natural teeth.**





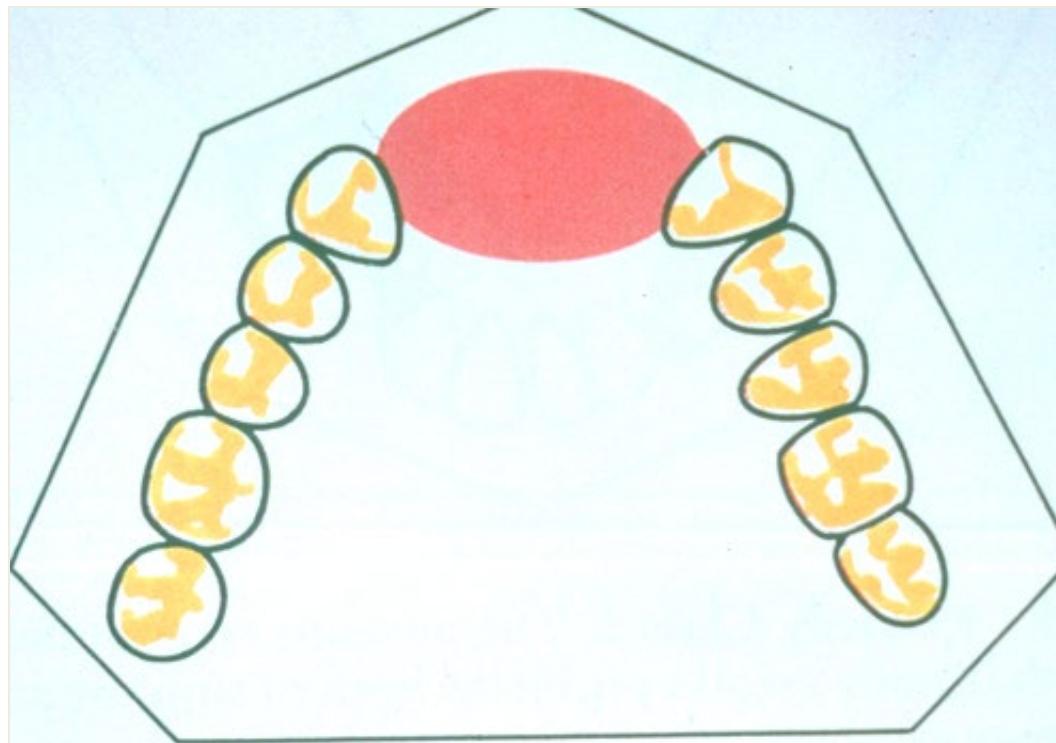
Class III-
Unilateral edentulous areas with natural teeth
both anterior and posterior

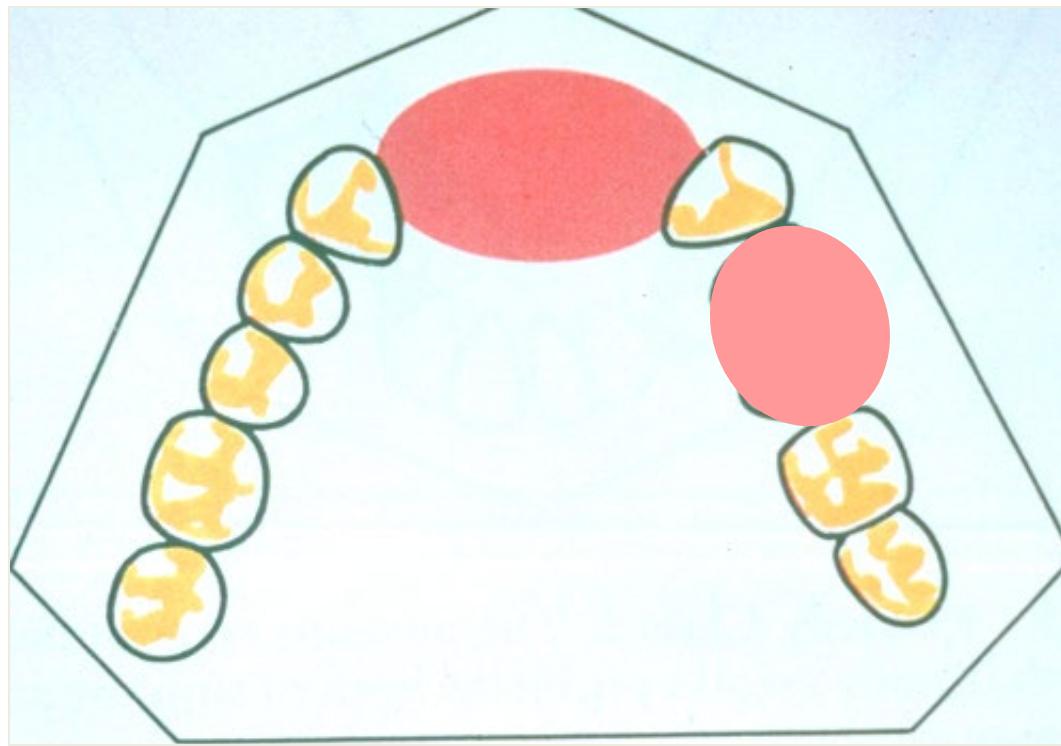




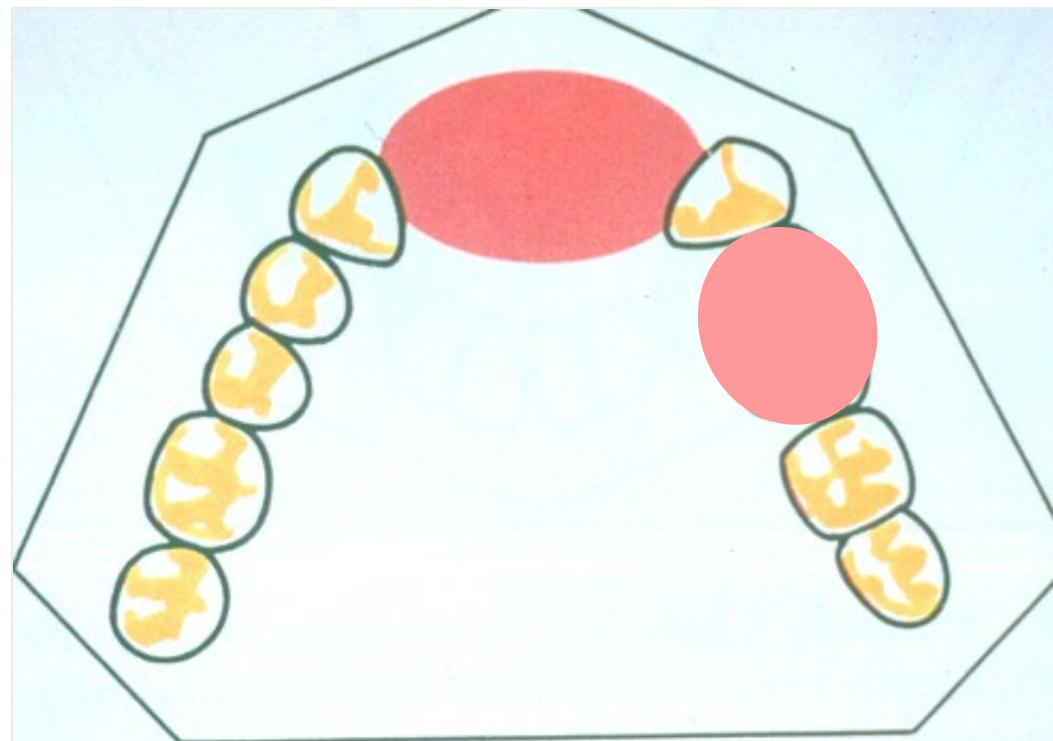
Class IV- never has "mod"

A single (crossing the midline) edentulous area located anterior to the remaining natural teeth

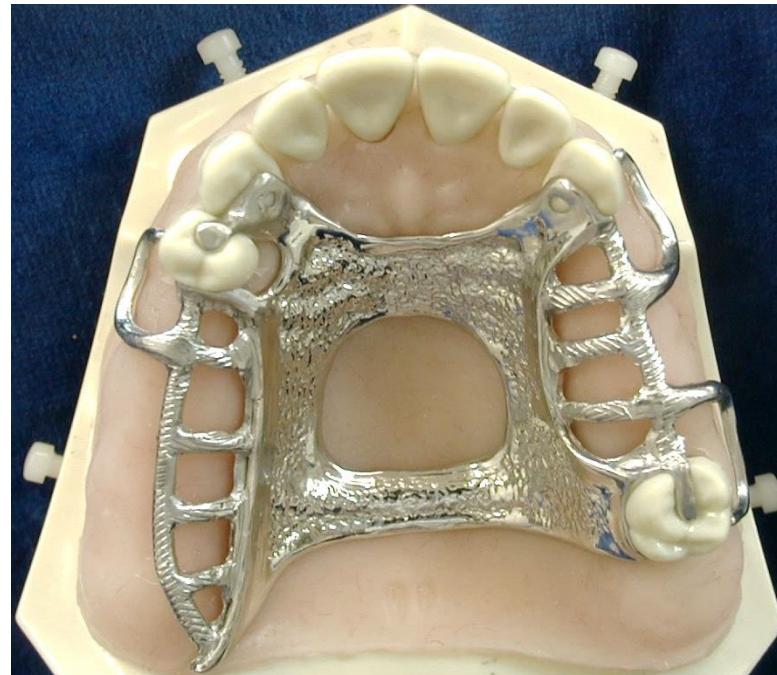




Class III, mod 1-
most posterior edentulous span
determines class



An RPD is a complex piece of machinery.
If poorly planned or executed, it can do catastrophic damage.



The primary purpose of RPD therapy must always be
“the preservation of that which remains, and not the meticulous replacement of that which has been lost.”

-DeVan

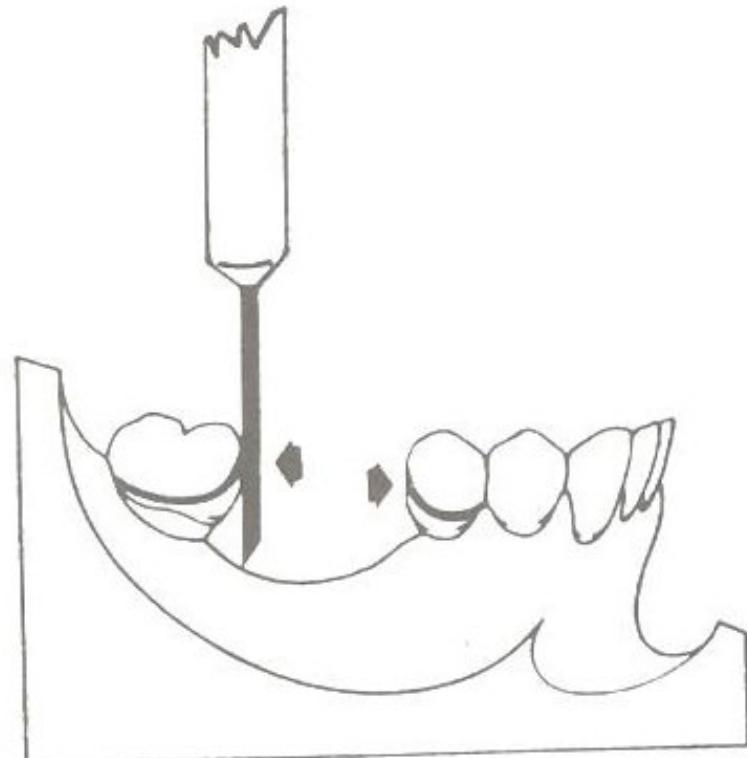
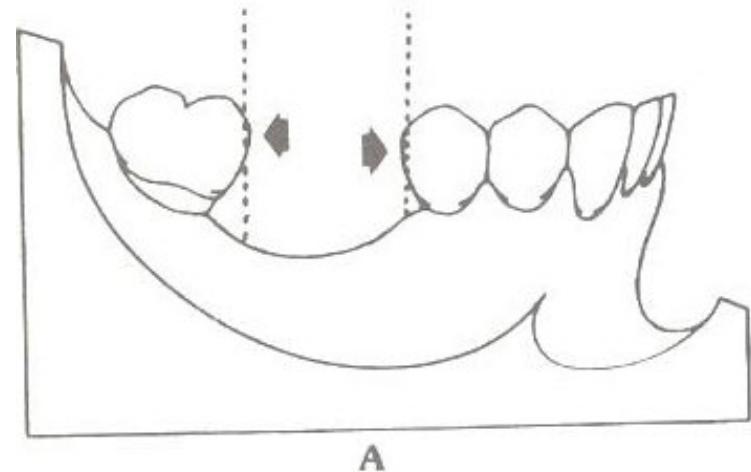
The Basics:

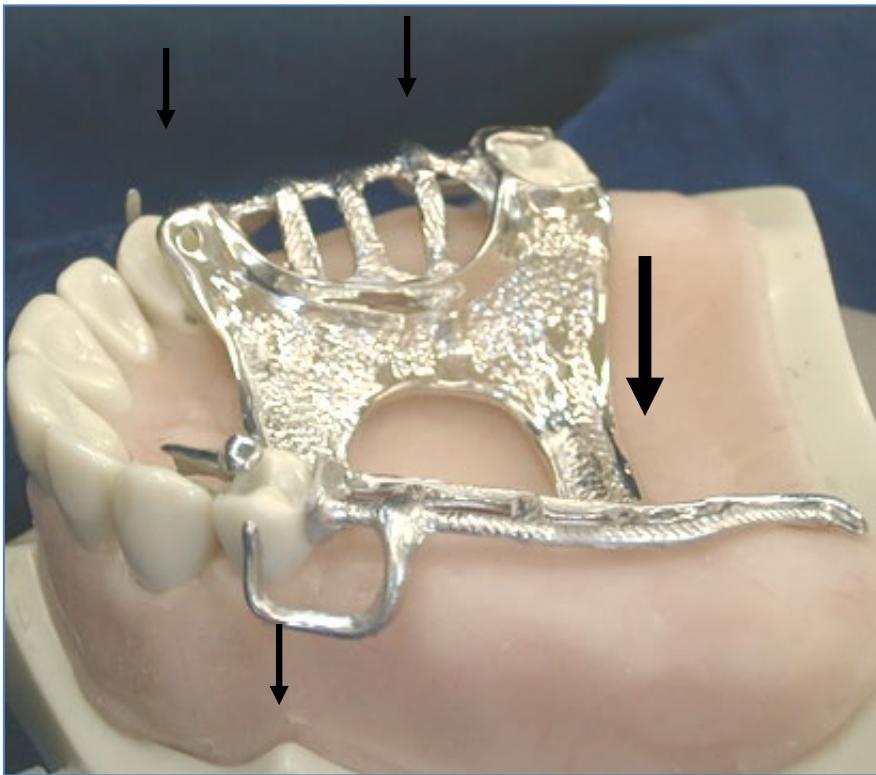
Guiding Planes and Retentive Undercuts

Guiding Planes

Prepared parallel to
the path of insertion.

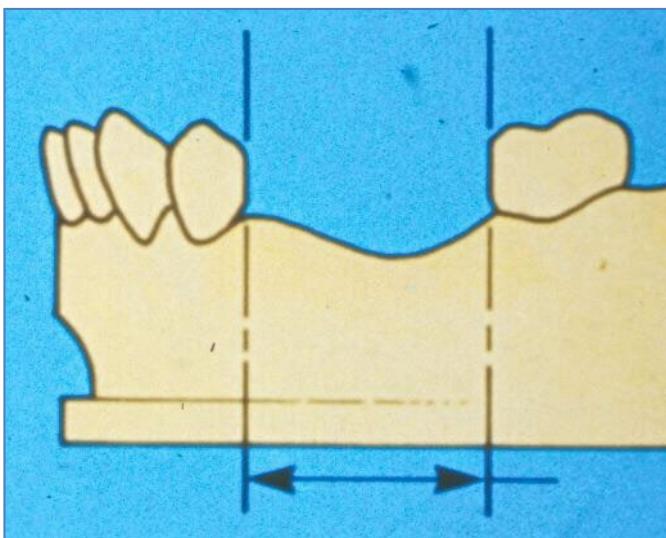
In harmony with clasp
placement.

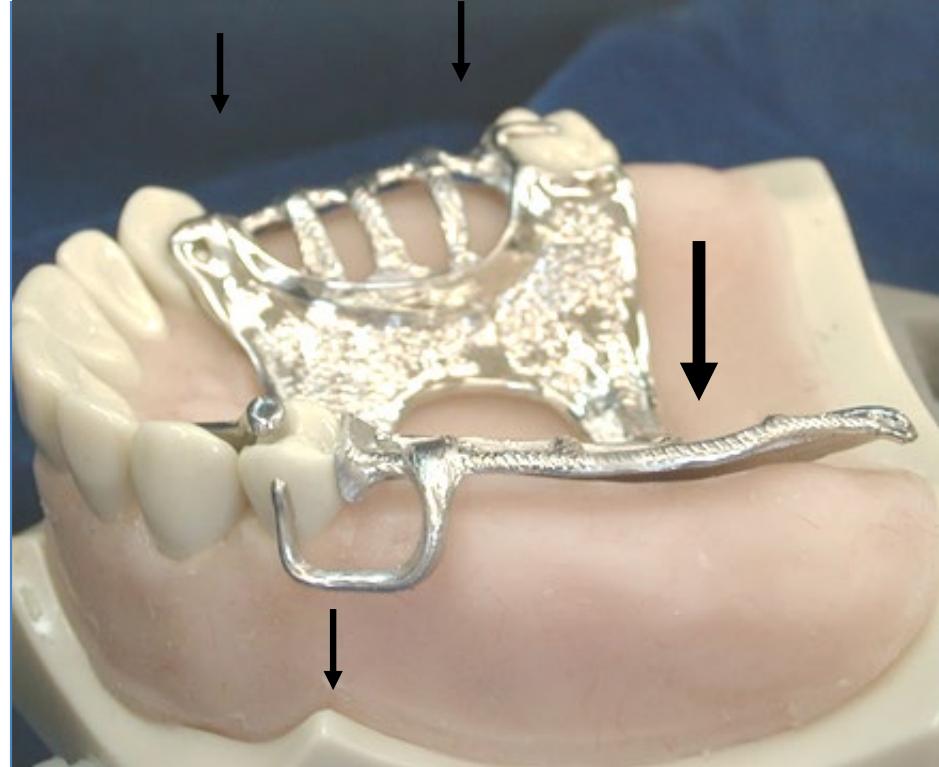
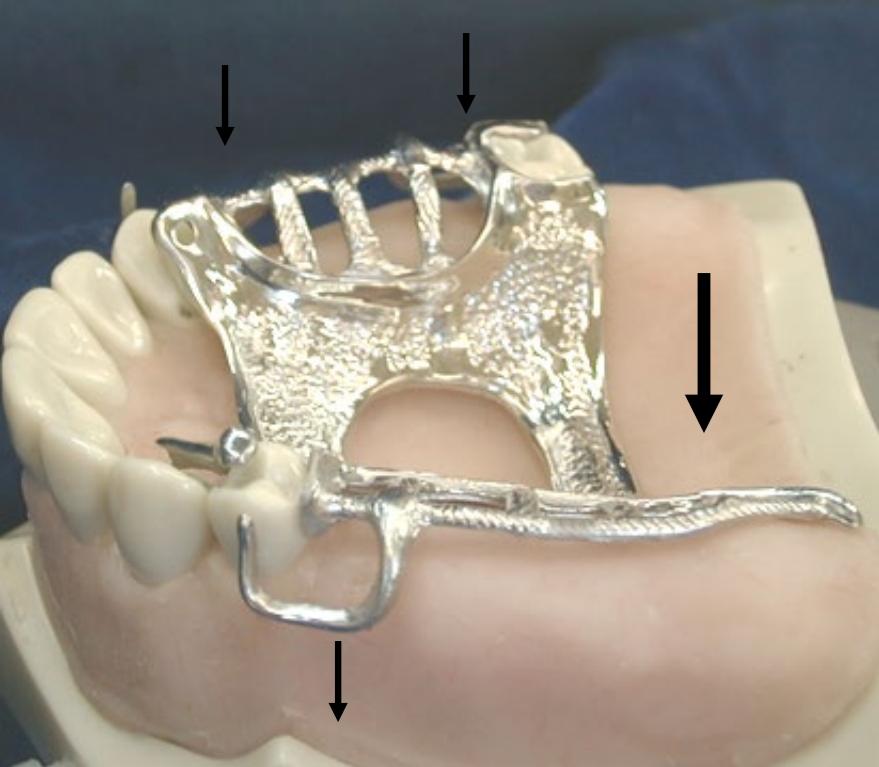




The proximal plates of the RPD are the initial contacts on the abutment teeth as the RPD is introduced into the mouth.

Must follow the same path guided by the proximal plates against guiding planes.



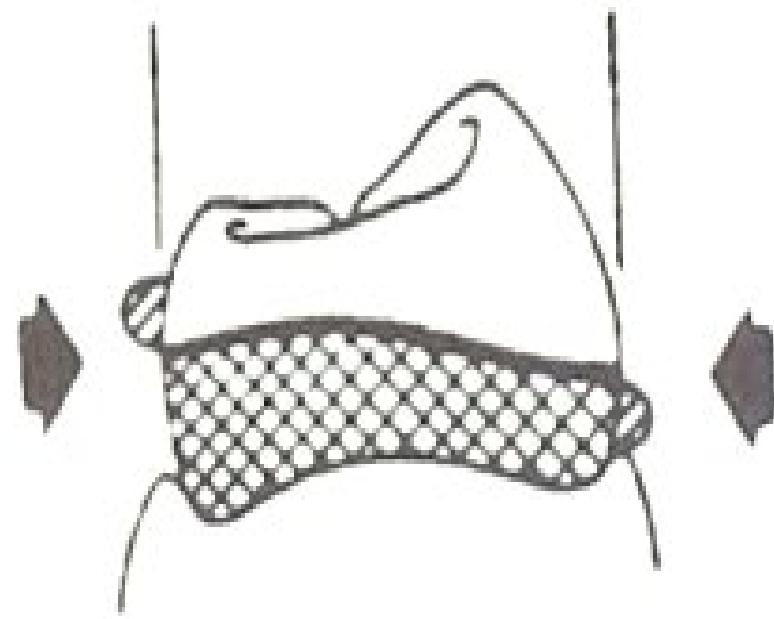


As seating continues, retentive clasp passes over height of contour and passes into undercut area.

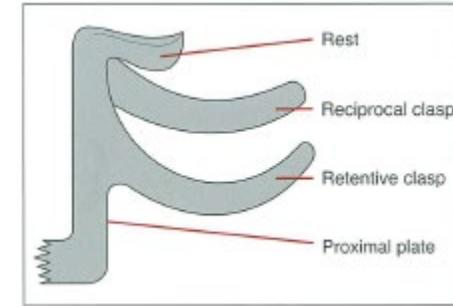
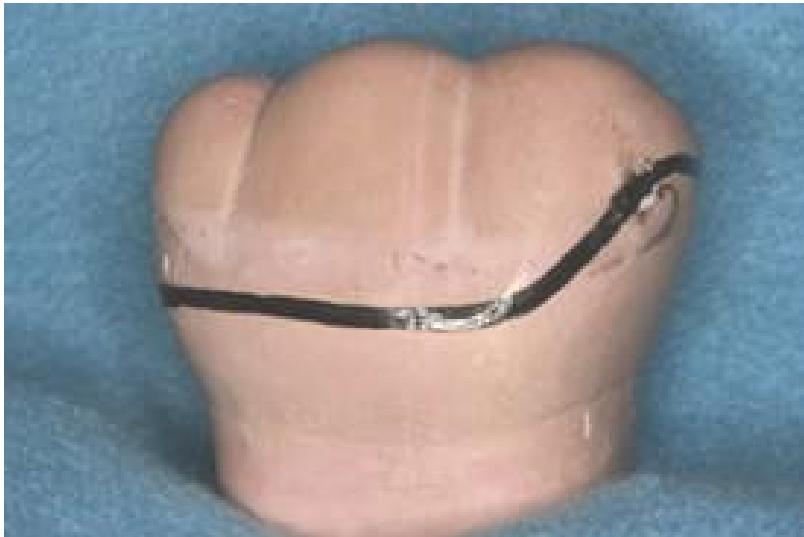
Retention of RPDs usually comes from clasp that flexes over height of contour and rests in undercut. This results in mechanical retention.

These terms describing tooth contour all have the same general meaning:

- Survey line
- Greatest bulge
- Suprabulge/infrabulge
(occlusal/apical to SL)
- Height of contour
- Undercut/non-undercut
- Above/below

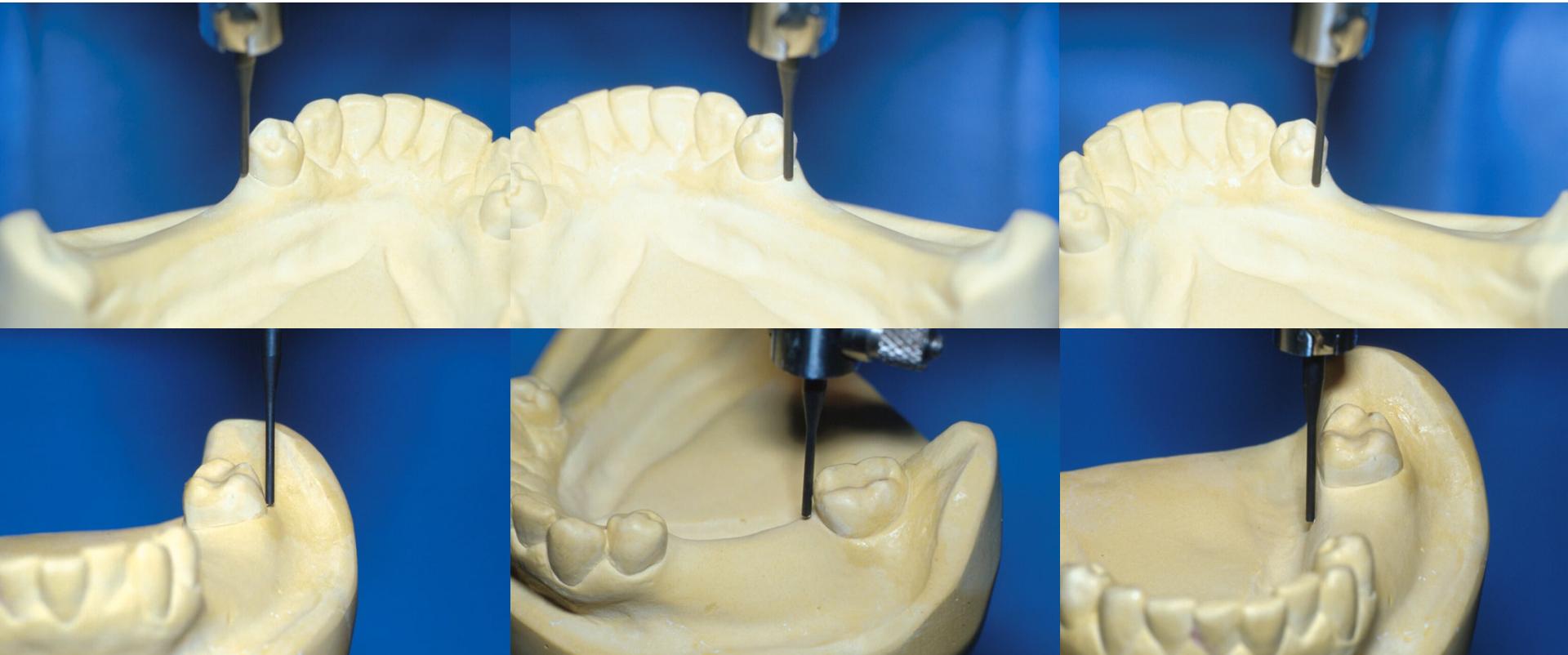


Retentive Circlet Clasp



- Terminal 1/3 of retentive clasp is flexible.
- Flexes (active) over height of contour and then relaxes (passive) after reaches its undercut position (.010")

Purpose of Surveying



Find cast orientation in harmony with:
Guiding planes and retentive undercuts.

Establish Guiding Planes



Find undercut areas for retention



Dental Surveyor



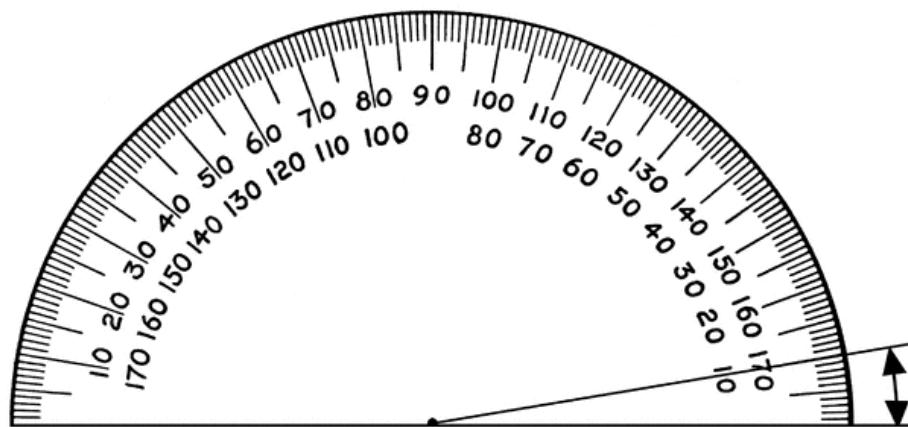


Surveying & Tripoding: Initial cast orientation



**“Eyeball” cast on survey table. Adjust so
occlusal plane is “flat with floor”, a
neutral tilt.**

- As you start analyzing, you may find it necessary to change the tilt from neutral (flat with the floor) to either even up guiding planes or to find retentive undercuts.
- You should not change the tilt more than 10 degrees from neutral.



Surveying

- Analyze tooth contours
- Determine cast orientation

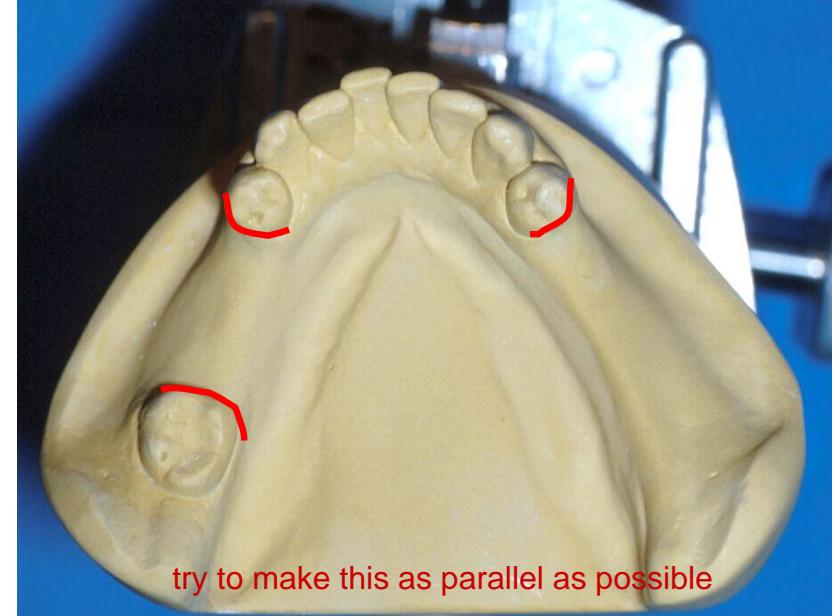
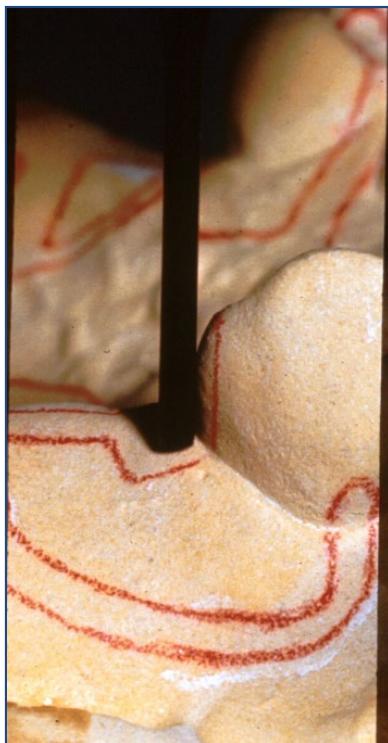
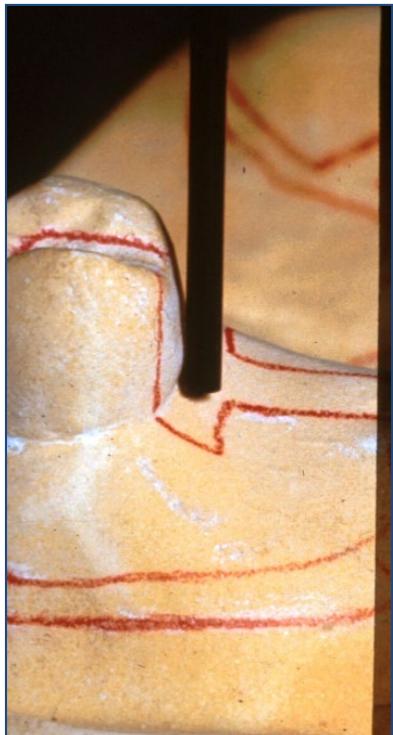


Analyzing rod (diagnostic tool)

Used to check the parallelism of guiding planes & evaluate the height of contour of teeth.

(Be careful, it bends easily, and is then useless.)

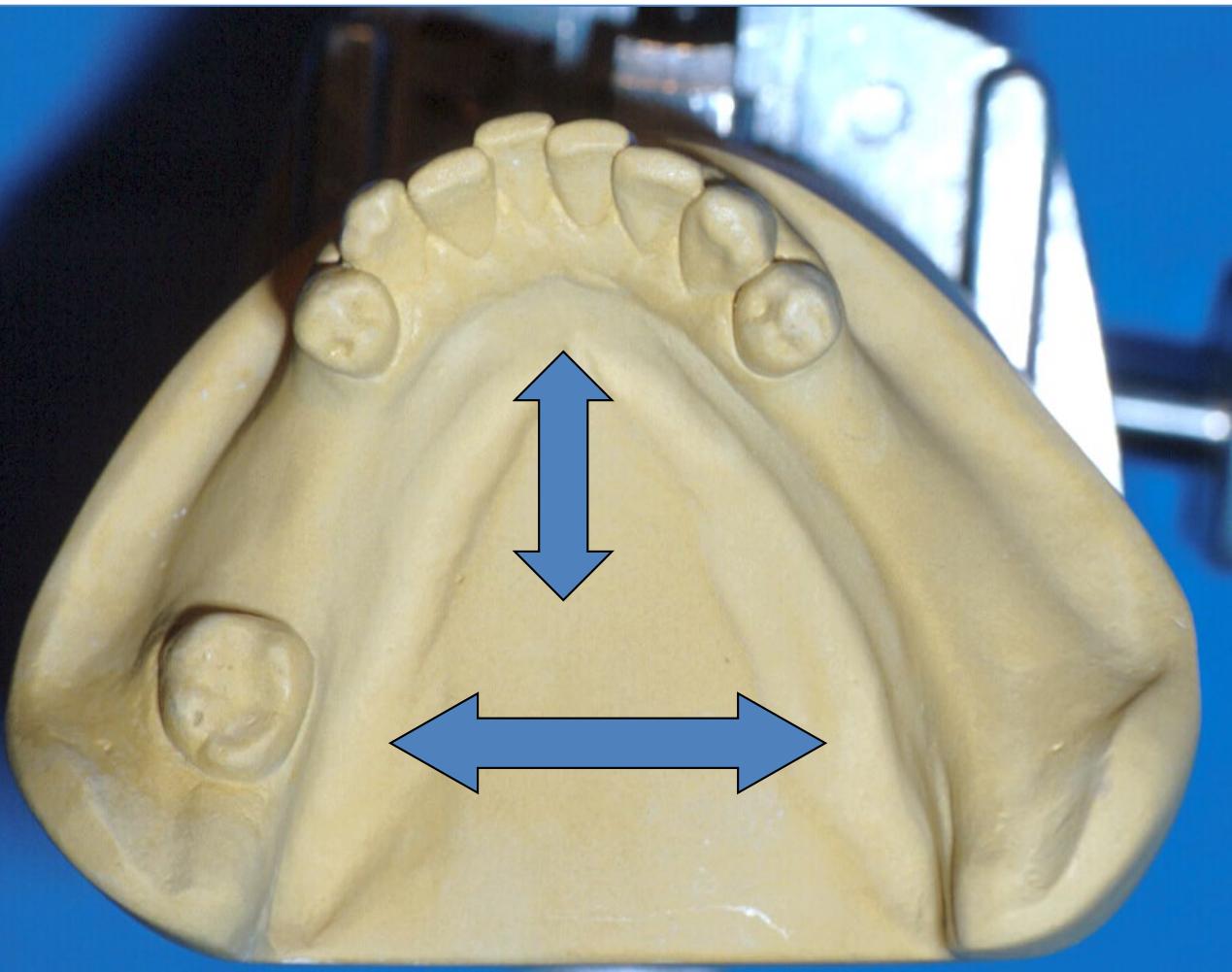
**First...
orient so all guiding planes
in arch are as parallel as
possible.**



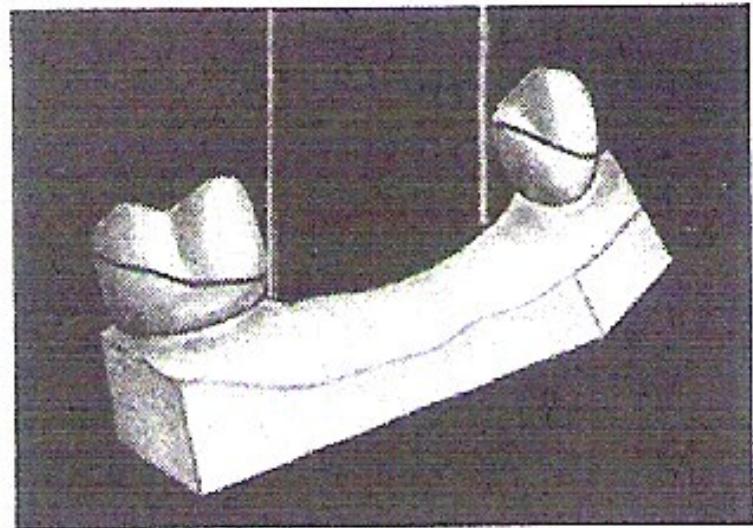
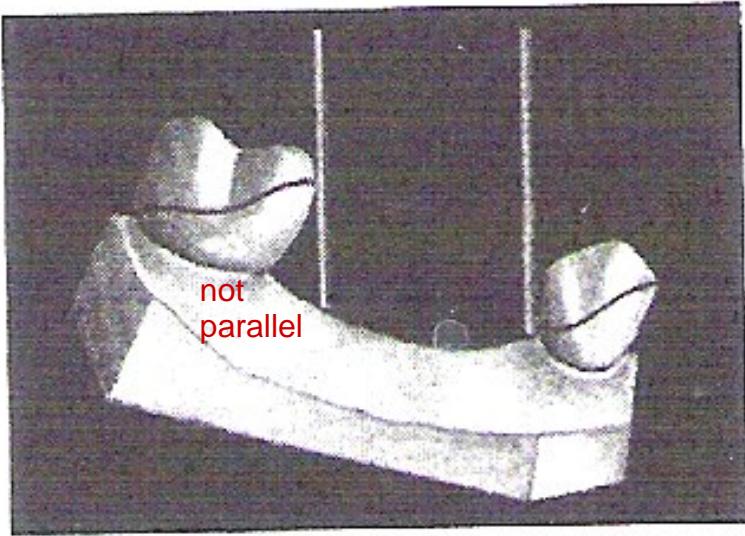
**Find balance of parallel
interproximal surfaces.
So, when cutting parallel
guiding planes, there is
no one abutment that
must have excessive
structure removed.**

Altering cast orientation

- Change in anterior-posterior tilt mostly affects parallel guide planes
- Lateral changes affect amount of undercut



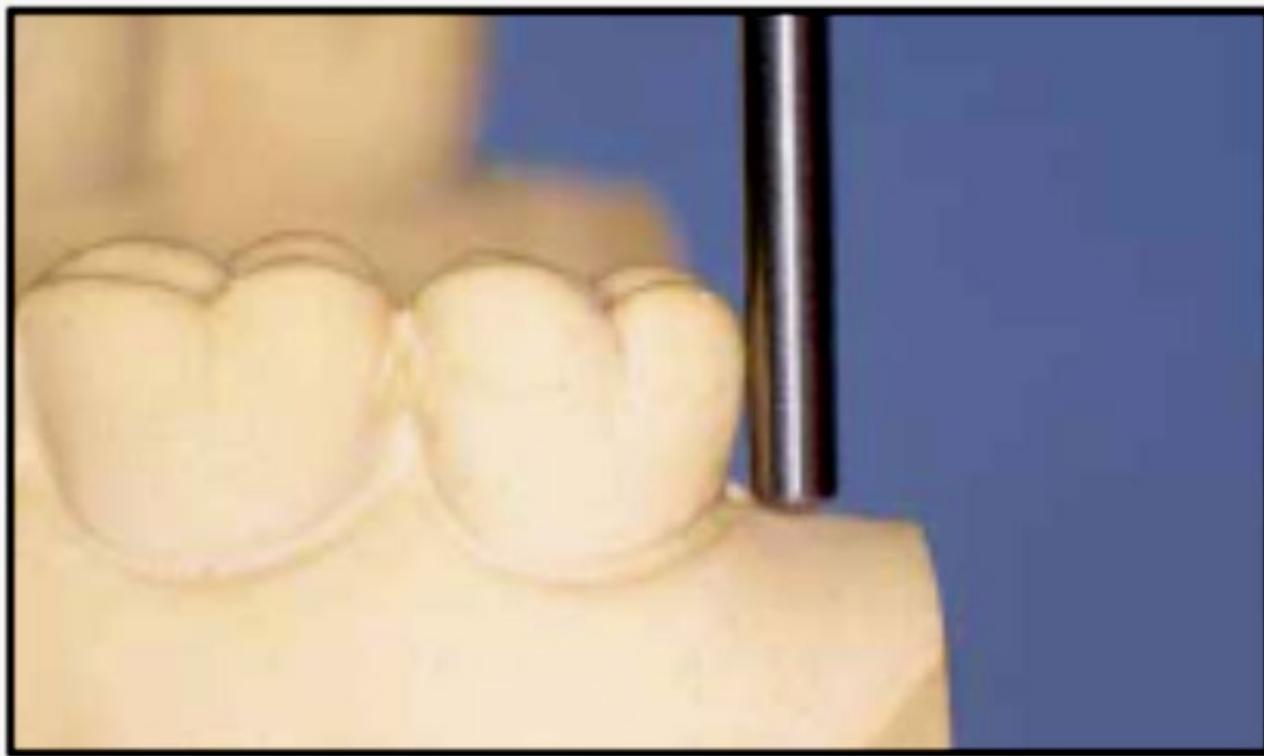
Change cast tilt until guiding surfaces and undercuts seems equal or parallel if possible.
-“flat with the floor” is neutral tilt.



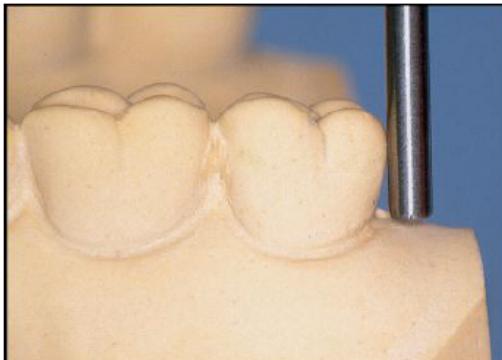
- **Changing tilt of cast affects survey lines.**

split the difference btw guiding planes

Analyzing rod place against tooth to identify undercut area.

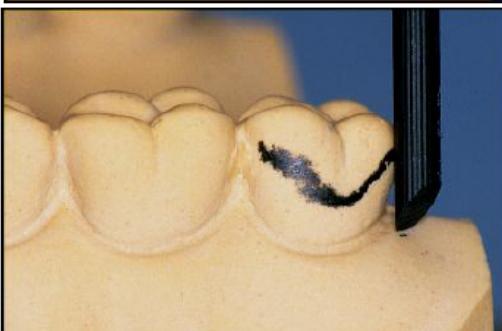


SURVEYING STUDY MODELS



ANALYZING ROD

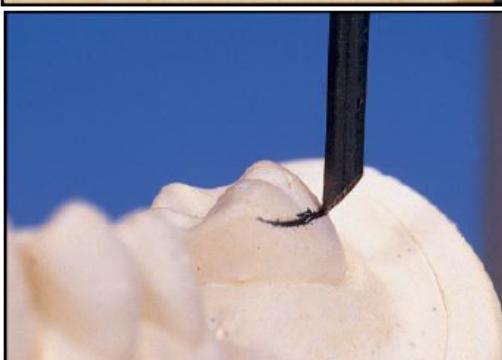
This metal rod is placed against the teeth and ridges during the initial analysis of the cast to identify undercut areas and to determine the parallelism of surfaces without marking the cast.



GRAPHITE MARKER

The graphite marker is moved around the tooth to identify and mark the position of maximum convexity (survey line) separating non-undercut from undercut areas.

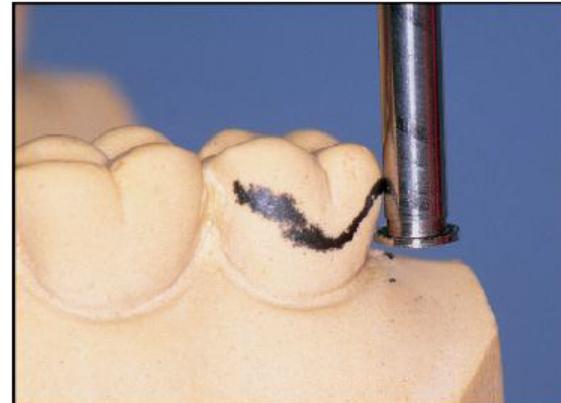
When surveying a tooth, the tip of the marker should be level with the gingival margin allowing the side of the marker to produce the survey line as shown in the illustration.



POSITION OF MARKER

A false survey line will be produced if the tip of the marker is incorrectly positioned. In this example there is not, in fact, an undercut area on the tooth although an incorrect surveying technique has indicated one. If this false line is used in designing an RPD, errors will arise in the positioning of components, especially clasps.

1



UNDERCUT GAUGES

Gauges are provided to measure the extent of horizontal undercut and are available in the following sizes: 0.010", 0.020", and 0.030" (0.25 mm, 0.50 mm and 0.75 mm). By adjusting the vertical position of the gauge until the shank and head contact the cast simultaneously, the point at which a specific extent of horizontal undercut occurs can be identified and

marked. This procedure allows correct positioning of retentive clasp arms on the tooth surface



VISUALIZING AMOUNT OF UNDERCUT

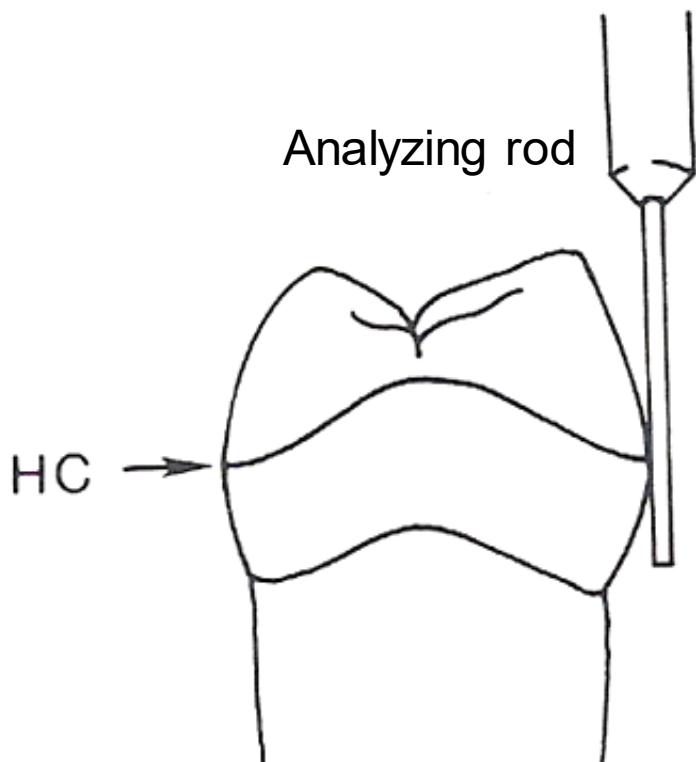
The cast is positioned with the occlusal plane horizontal. The teeth and ridges are then surveyed to identify undercut areas that might be utilized to provide retention in relation to the most likely path of displacement. The position of the survey lines and the variations in the horizontal

extent of undercut associated with them should be noted. The amount of undercut can be judged approximately from the size of the 'triangle of light' between the marker and the cervical part of the tooth, or measured more precisely by using an undercut gauge. An assessment can then be made as to whether the horizontal extent of undercut is sufficient for retention purposes

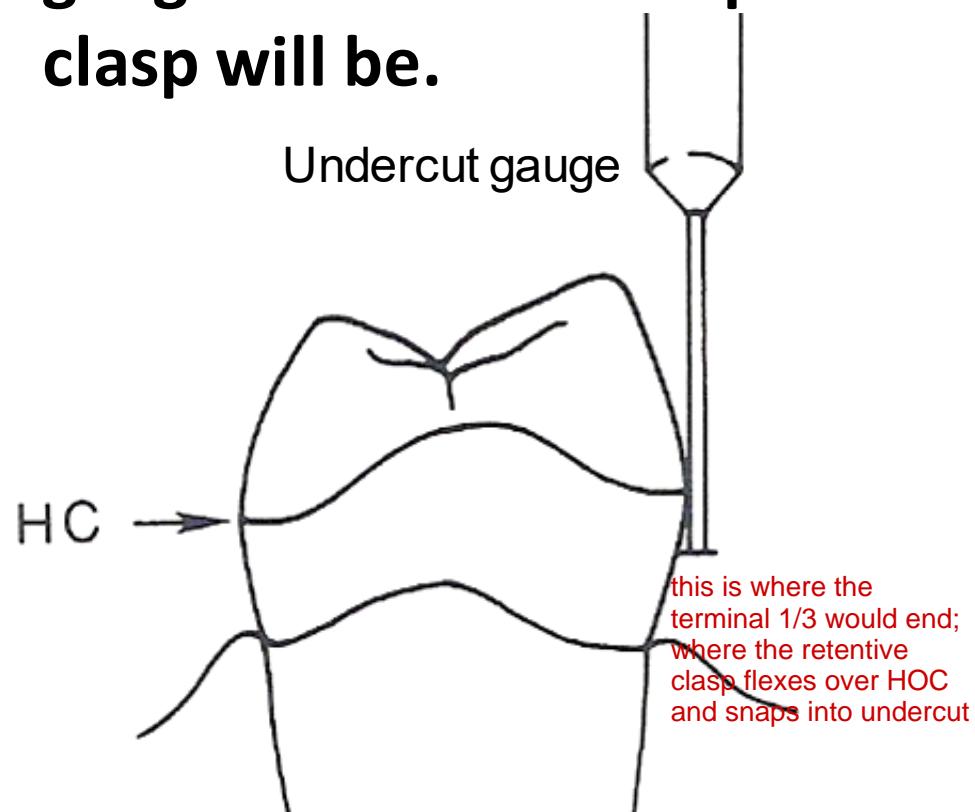
2

Retentive Undercuts

Locate undercut with the analyzing rod.

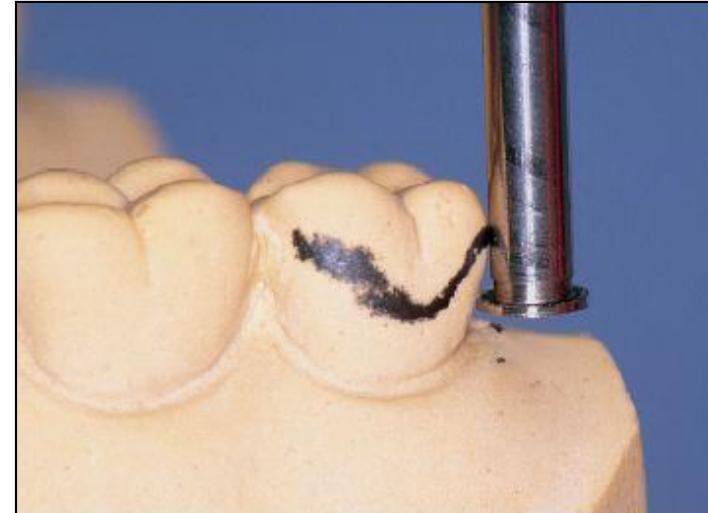


Measure with undercut gauge to find where tip of clasp will be.



Identifying Retentive Location

- Look for triangle of light
- Magnitude of undercut
- 0.10, 0.20, 0.30 of an inch measured by undercut gauges
- For retentive tip of clasp



Undercut Gauges

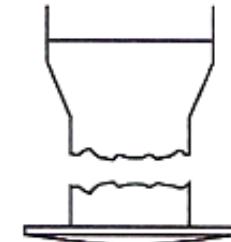


One Ring

.010"

ten one thousandths of an inch

0.25mm

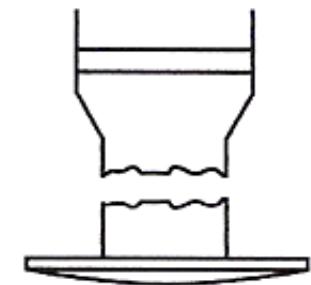


Two Rings

.020"

twenty one thousandths of an inch

0.56mm

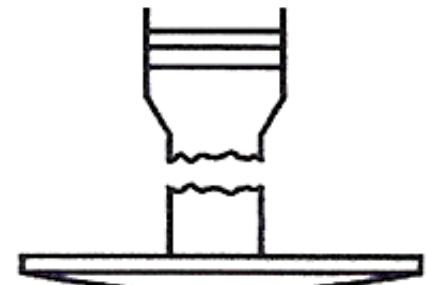


Three Rings

.030"

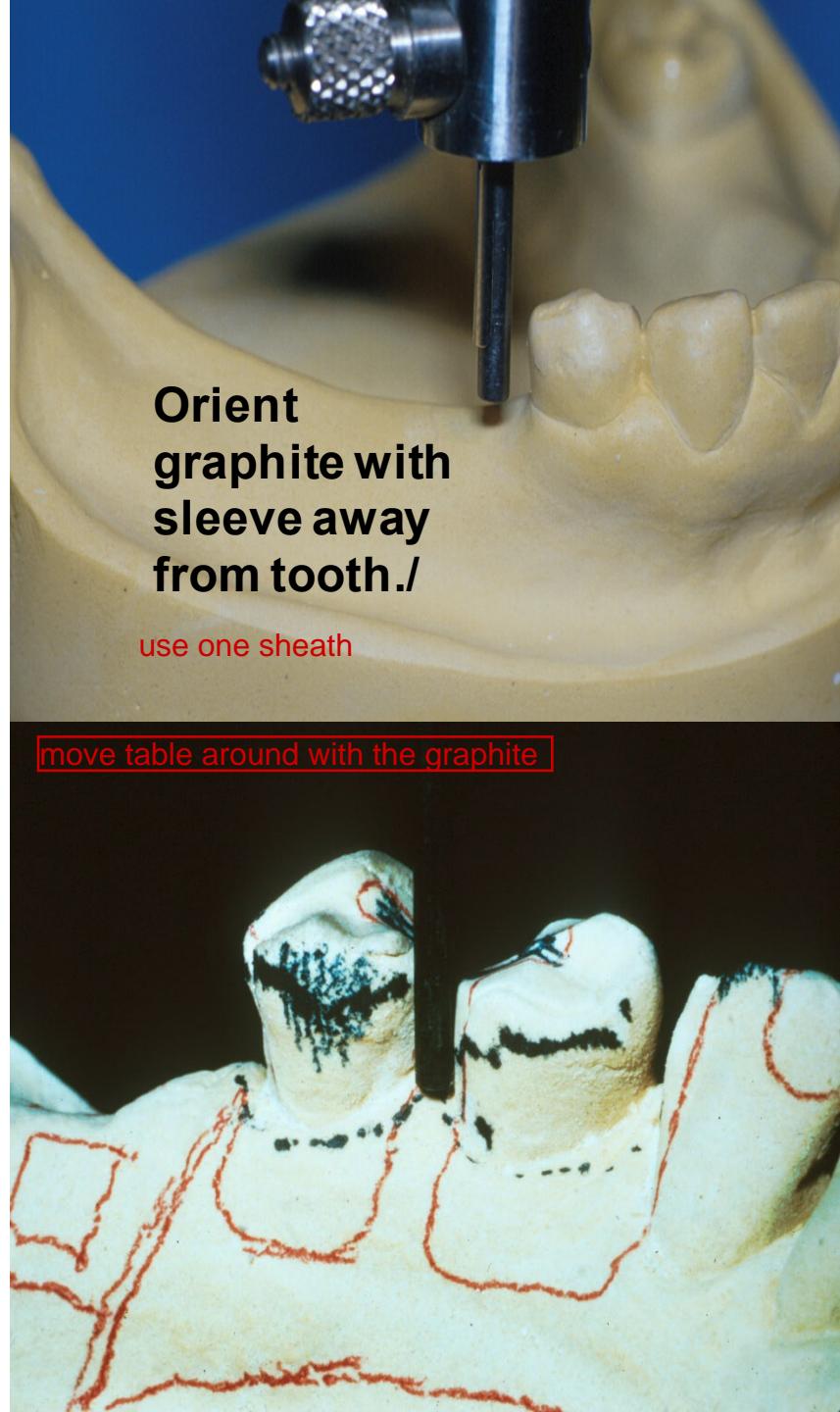
0.75mm

we dont use this one



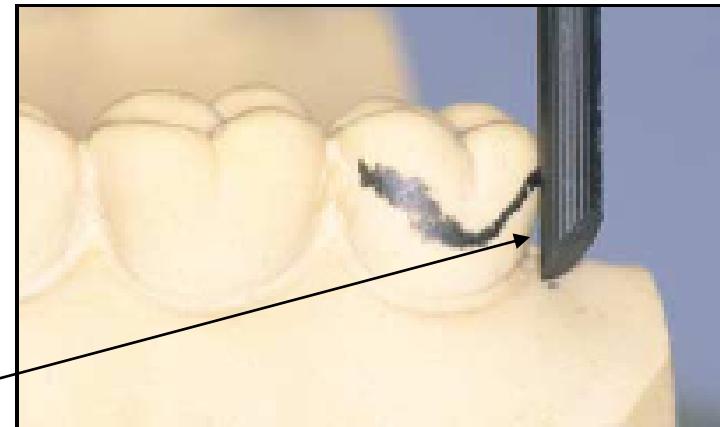


Graphite marker with reinforced metal sleeve marks the height of contour. This is the survey.



Surveying with graphite marker

- Moved around tooth to identify height of contour
- Tip of graphite should be well below survey line
- If placed too high on tooth, will give false line
make sure graphite placed properly
- There is no undercut below this survey line



✓

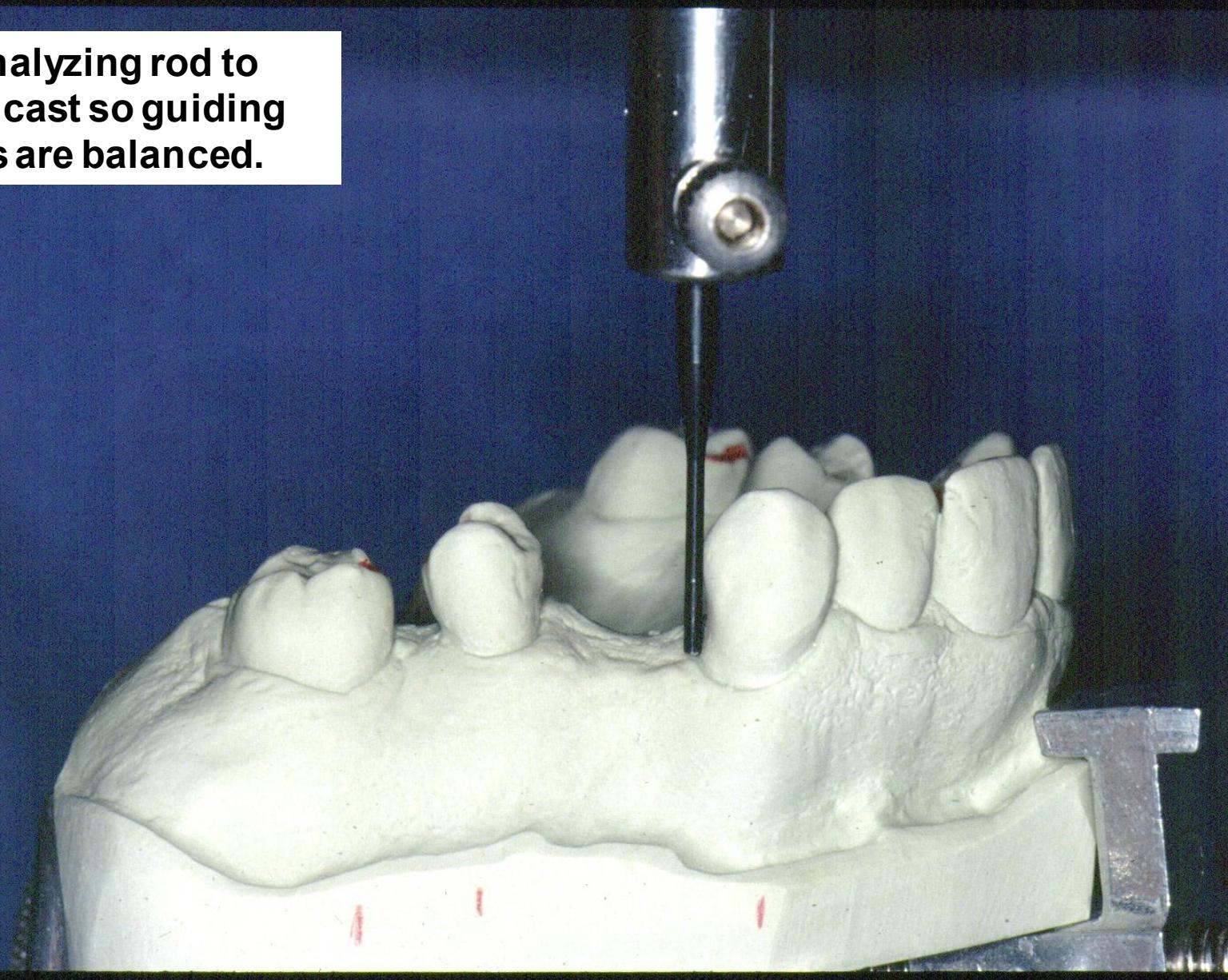


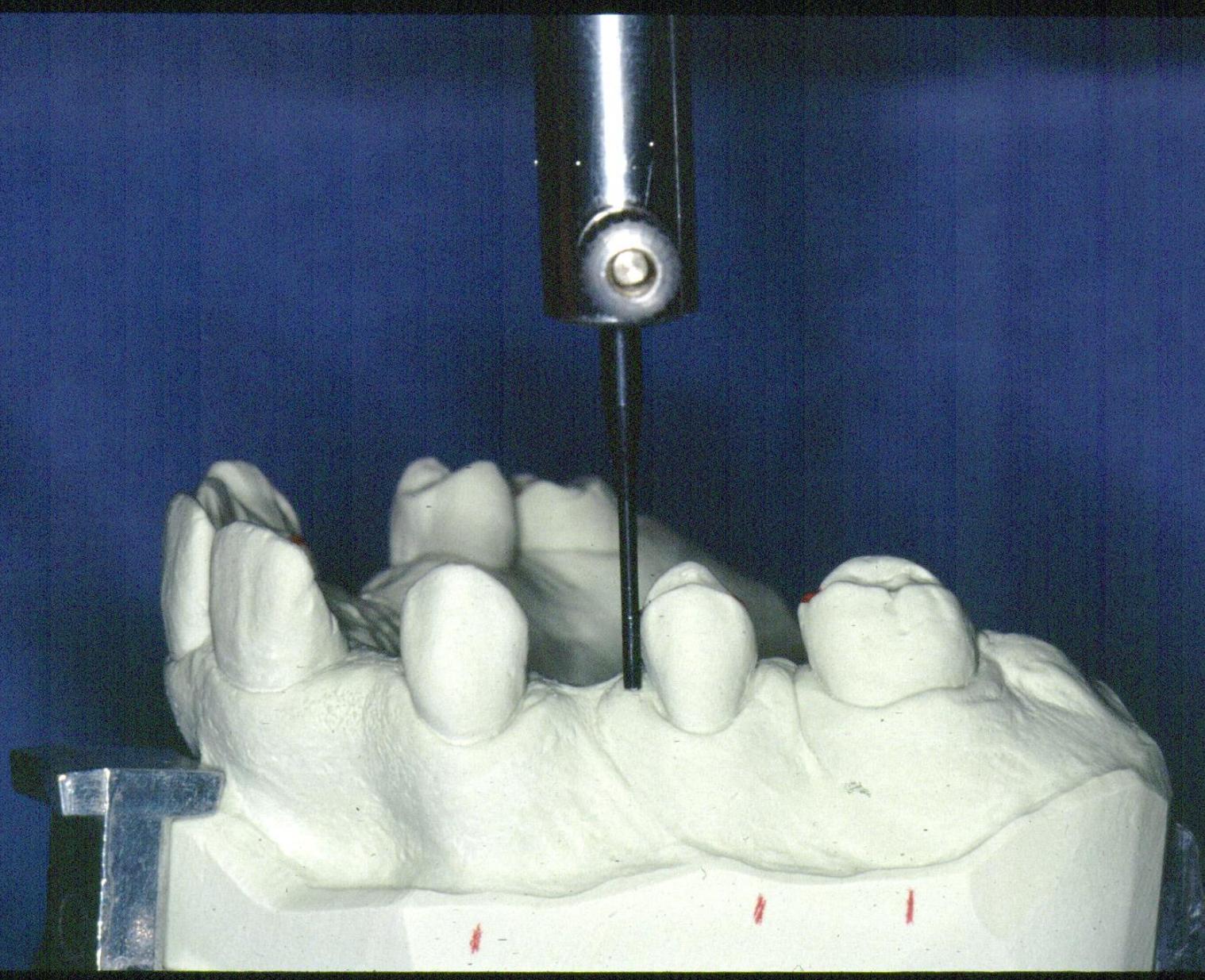
✗



4

**Use analyzing rod to
orient cast so guiding
planes are balanced.**

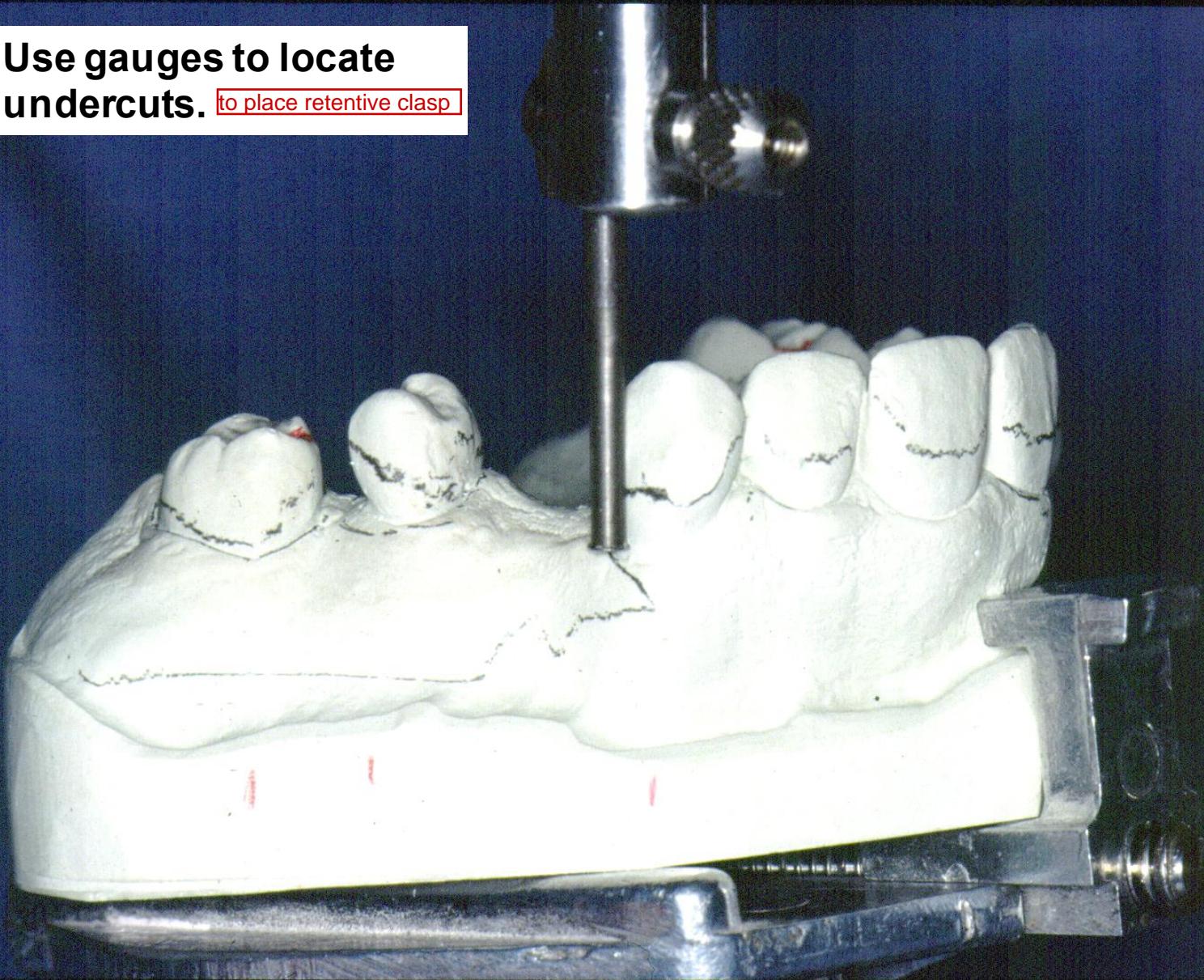


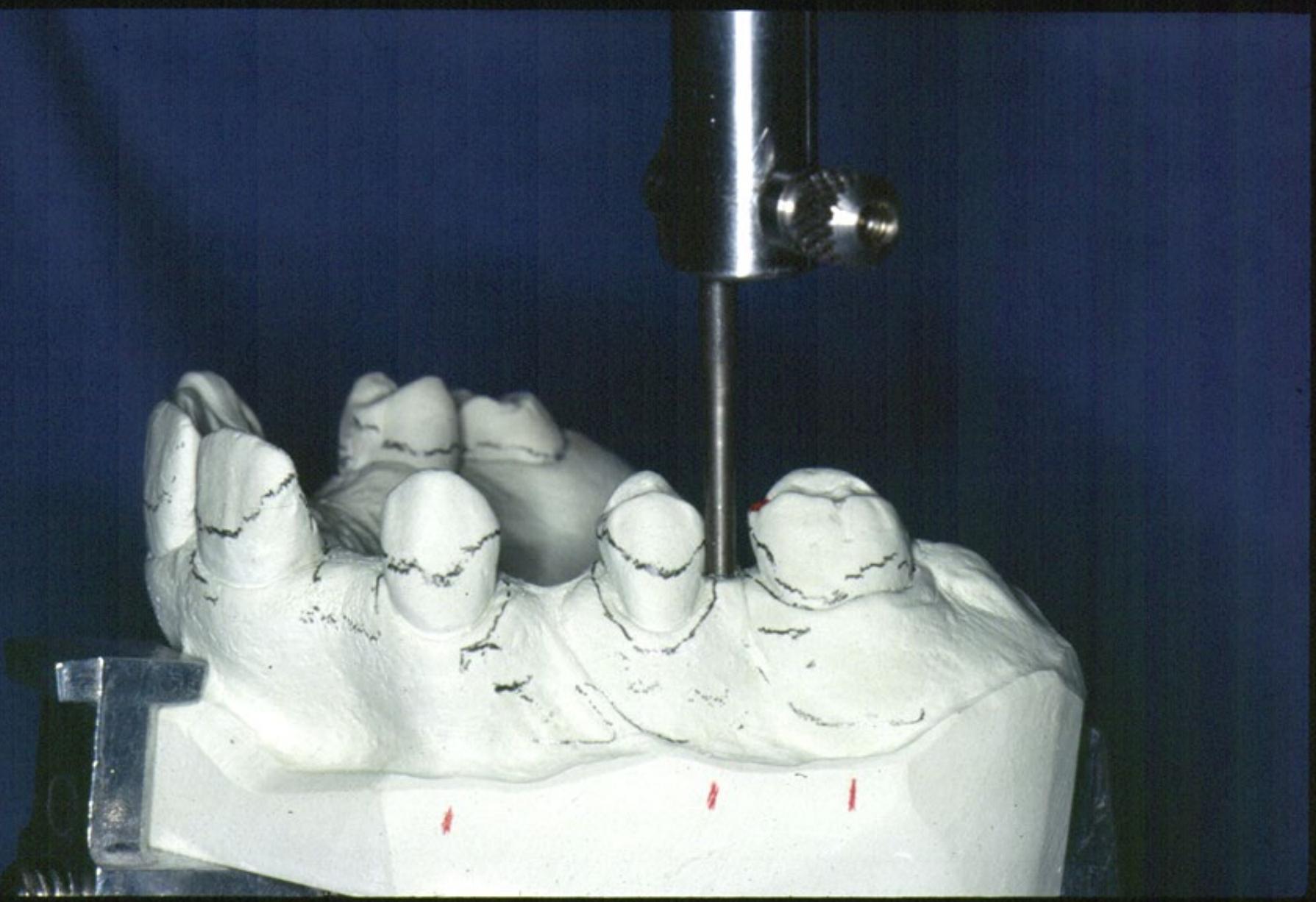


**After you determine
cast orientation, survey
all teeth in arch.**



**Use gauges to locate
undercuts. to place retentive clasp**

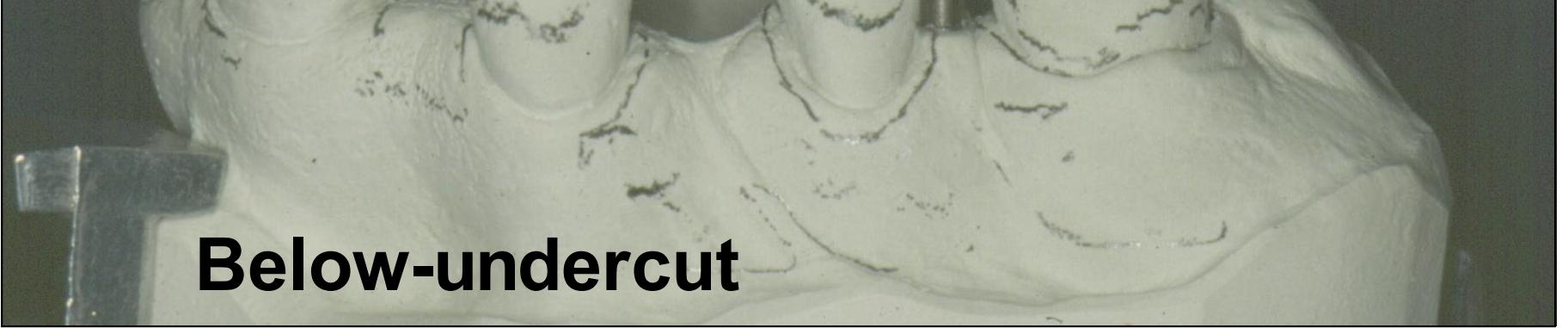








Above-not undercut



Below-undercut

3 points to define a plane, hence "tripod"

Surveying and tripoding is done after the best tilt is determined.

Now, anytime the cast needs to be examined again at this best tilt, it can be easily found by aligning the tripod marks.

