

Biometric Approach in Designing Complete Dentures

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- Pattern of bone resorption.
- Landmarks to positions of the predecessors.
- The biometric method of impression making.
- Biometric special trays.
- Land marks to determine lip support and vertical dimension of occlusion

- Maxilla resorbs primarily from the buccal and labial surfaces
- Mandible:
 - Posterior arch width increases in size

Anatomic Effects of Resorption

Reduction in alveolar ridge leads to

- Reduction of the pre-extraction morphologic face height
- Reduction in the rest face height
- Causes mandible to rotate forward-upward affecting the vertical dimension

Mechanism of Complete Denture Support

- Forces produced on occlusal surfaces by masticatory muscles are transmitted to ridge
- Maximum biting forces are 5-6 times less for complete dentures wearers
- Mean denture-bearing area in edentulous maxilla 23cm² and edentulous mandible 12cm²

{Zarb et al, 1997}

It is generally accepted that impressions of edentulous mouths should place the lips and cheeks in their pre-extraction positions.

The means of achieving this vary considerably between different operators.

Denture space: is that space in the mouth which was formerly occupied by the teeth and the supporting tissues which have since been lost.

Function of impression trays ??

By the 'tray' is meant the appliance that carries the impression material into the mouth, whether the appliance is a conventional tray or a record block inside which a paste-wash impression is taken.

When placed in the mouth the empty tray should satisfactorily restore the facial contour and provide an airtight seal between the tray and the oral tissues. Thus, the empty tray should be retentive before the impression is taken.

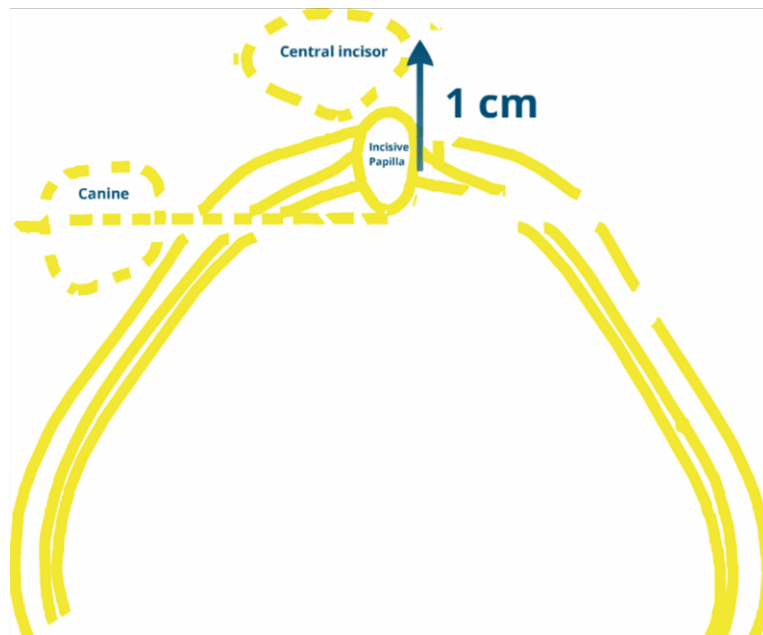
RESTORATION OF FACIAL CONTOUR

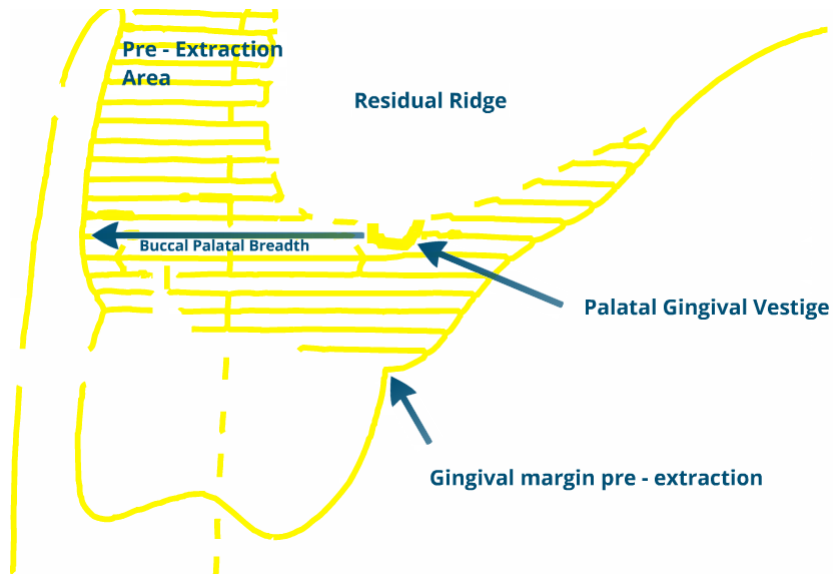
There are several methods of ensuring that the facial contour is properly restored:

1. If the impression is to be taken within a record block, the block should be modified to establish the lip form and buccal contour.
2. If a conventional impression tray is used, it should be built out with impression compound until the facial form is restored.
3. use measurements of the average pre-extraction buccolingual breadth of the alveolar process to define the positions of the lips and cheeks and to construct what we call 'biometric' trays. These restore the pre-extraction form of cheeks and lips so that the correct shape of the sulcus can then be recorded with a soft impression material.

Construction of a maxillary biometric tray

the incisive papilla and the palatal-gingival margin (the remnant of the gingival margin on the palatal side of the dental arch, which after tooth extractions often remains visible as a cordlike elevation) work as landmarks for estimating the preextraction dimensions of the ridge.

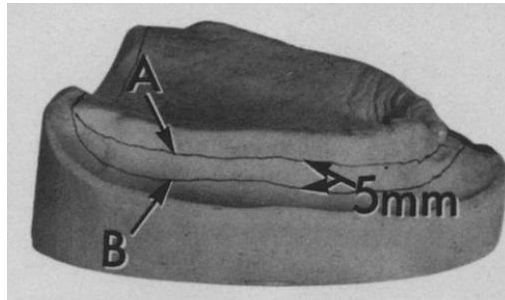




The distance between the palatal gingivae and the labial or buccal surface of the teeth is termed the buccopalatal breadth. The is on average about 6 mm in the incisor region, 8mm for the canines, 10 mm for the premolars and 12mm for the molars. Therefore, by distinguishing the palatal gingival vestige, the position of the labial surface of the artificial teeth can be readily identified

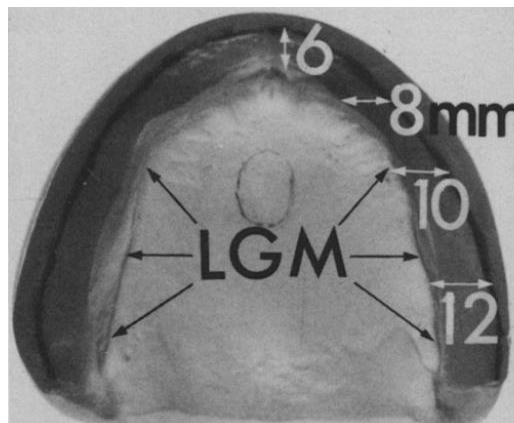
Construction of a maxillary biometric tray

- 1) Take the preliminary impression so that the preliminary cast represents the full sulcus width.
- 2) On the cast from the preliminary impression, make a pencil line 5 mm on the sulcus side of the mucogingival line to indicate the depth of the buccal flange of the upper tray

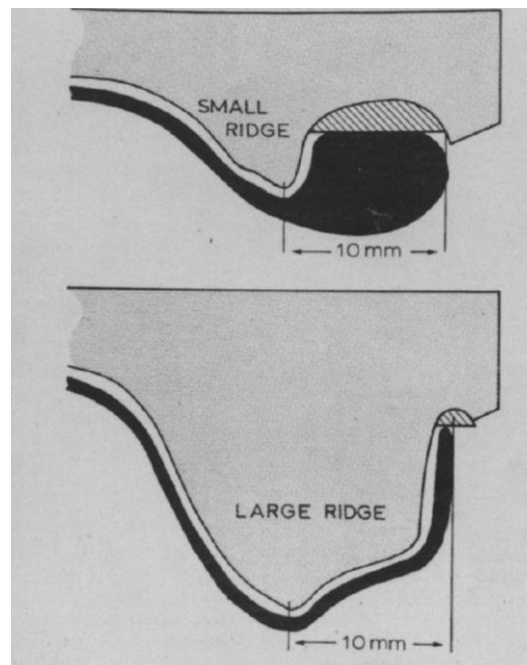


- 3) Fill the buccal sulcus with wax to form a horizontal ledge of wax round the upper cast at the level of the pencil line.

- 4) With a pair of calipers mark on the wax the approximate average buccolingual horizontal measurements from the remnant of the lingual gingival margins. Sagittally in the incisor region and coronally in the other regions, these measurements are approximately 6 mm (incisor), 8 mm (canine), 10 mm (premolar) and 12 mm (molar).



5. Draw a line on the wax joining these measurements together.
6. On the cast lay down a wax spacer of appropriate thickness to provide room for the impression material to be used.
7. Make a tray so that the outer surface of the periphery lies on the line marked on the wax ledge.



8. Place a localizing stop in the vault of the palate to ensure correct placement of the tray when the Impression is taken.
9. Biometric trays designed on the basis of the average pre-extraction measurements of buccolingual breadth displace the cheeks slightly and produce a buccal seal
10. Place a post-dam of tracing stick along the posterior edge of the tray and mould it in the mouth. When the post-dam has been formed, check the retention of the tray before taking the impression. In every case the empty tray should be retentive before the impression is finally taken with a fluid mix of impression material.

MANDIBULAR BIOMETRIC TRAY

Measurements of the kind made on the maxillary cast are not practicable on mandibular casts

Biometric lower trays are constructed to prevent the inward collapse of lips and cheeks and to hold them in their former upright positions, so that the impression material is supported as it runs round the edge of the tray and up between the tray and tissues.

The front of the biometric tray slopes forward to support the lower lip and in this way the labial sulcus is correctly defined. In the molar region the buccal flange of the tray is thickened so that the impression material is supported to delineate the form of the buccinator as its middle fibers sweep lingually towards the pterygomandibular raphae

Jaw relation registration

Nasolabial angle

Horizontal labial angle



Vermilion border show

The effect of nose form and angle of inclination of teeth

The relationship of maxillary incisors to the incisive papilla