

Anatomical Landmarks of Edentulous Arches

The anatomy of the edentulous ridge in the maxilla and mandible is very important for the design of a complete denture. The anatomic landmarks of upper and lower arches can act as positive guides to the limits of the denture base which must not interfere with the health or function of the tissues. The landmarks of an edentulous jaw are grouped into **limiting structures, supporting structures and relief area.**

1. Limiting structures

- These are the sites that will guide us in having an optimal extension of the denture so as to engage maximum surface area without engaging upon the muscle action.
- Encroaching upon these areas will lead to dislodgement of the denture and/or soreness of the area while failure to cover the areas up to the limiting structure will decrease retention, stability and support of the denture.

2. Supporting structures

- These are the load bearing areas. The denture should be designed such that most of the load is concentrated on these areas.
- Support is the resistance to the displacement towards the basal tissue or underlying structures.
- It can be divided into :
 - i) Primary stress bearing area
 - ii) Secondary stress bearing area

3. Relief area

- Relief areas are areas in the denture bearing area which should be relieved during construction of the denture.
- They are either resorbed under constant load, having fragile structures within or covered by thin mucosa which can be easily traumatized.

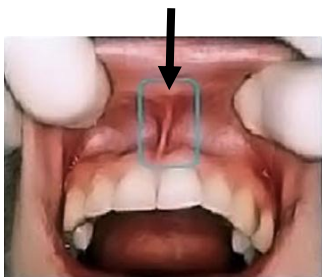
Anatomic Landmarks of Maxillary Arch

A. Limiting structures:

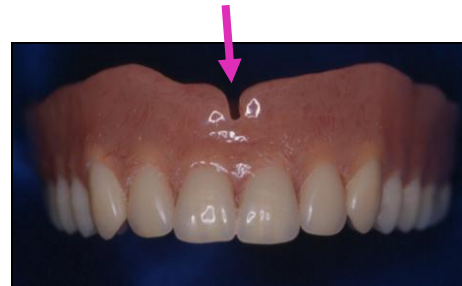
1. Labial frenum
2. Buccal frenum
3. Labial vestibule
4. Buccal vestibule
5. Hamular notch
6. Vibrating line
7. Fovea palatine

1. Labial frenum: it is a fold of mucous membrane at the median line extends from upper lip to the labial aspect of residual ridge crest, It contain no muscle fibers of significance . In the denture the area that is opposite to labial frenum called labial notch this notch is a **v-shaped notch** to prevent interference with the frenum.

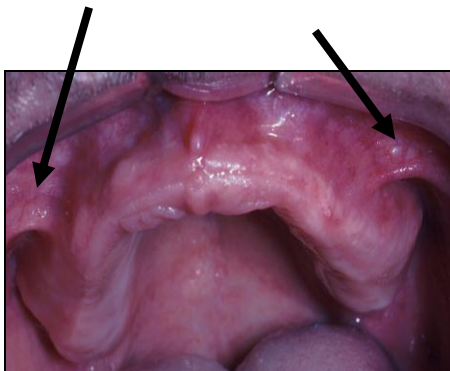
Labial frenum



Labial notch

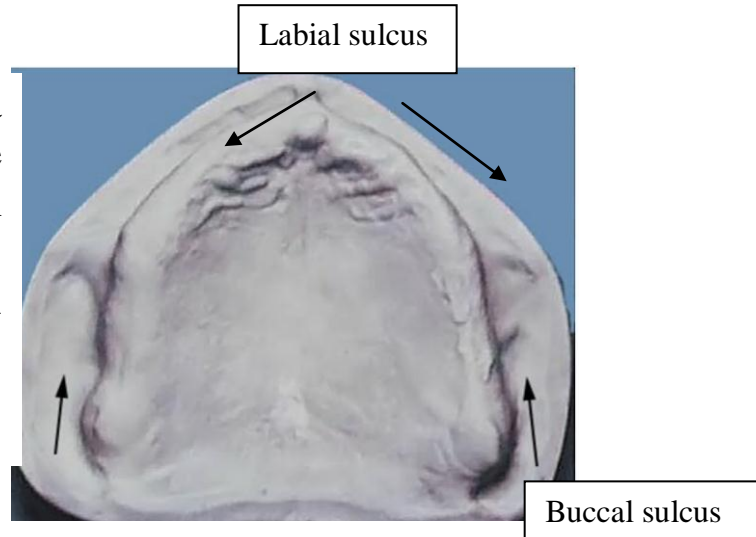


2. Buccal frenum: is a fold or folds of mucous membrane, extends from buccal m.m. reflection area toward R.R crest, it may vary in size and position, narrow or broad, single or multiple. Its reflection is in an anteroposterior direction and the buccal frenum movement affected by the following muscles: buccinators, orbicularis oris and levator anguli. It needs wider and relatively shallower clearance on the buccal flange of the denture than labial frenum.

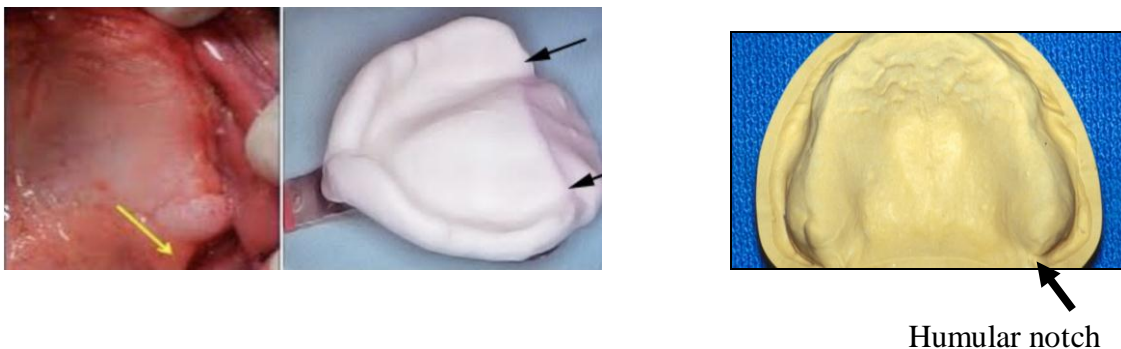


3. Labial vestibule (sulcus): a space lined by a thin mucous membrane, extends on both sides of the arch from the labial frenum to buccal frenum and bounded externally by upper lip and internally by the teeth, gingiva and alveolar ridge in dentulous mouth or by R.R in edentulous mouth. It is divided into two compartments by a labial frenum namely the right and left.

4. Buccal vestibule: is a space lined by a thin mucous membrane, extends from the buccal frenum to the hamular notch on both sides of the arch in edentulous mouth, it is bounded externally by the cheek and internally by the R.R.



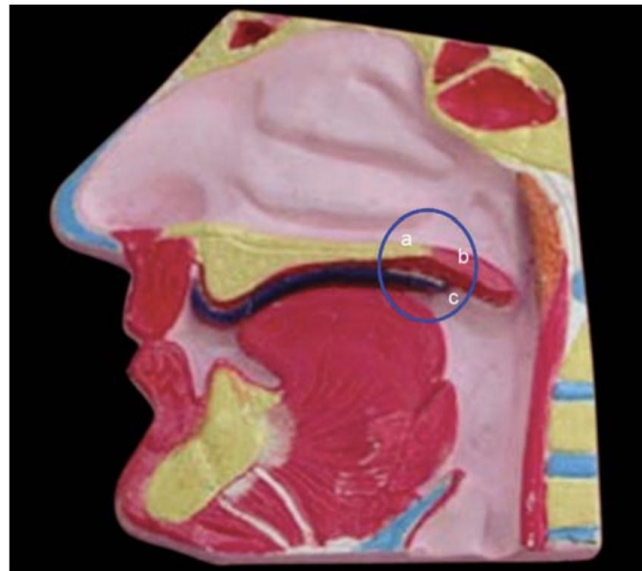
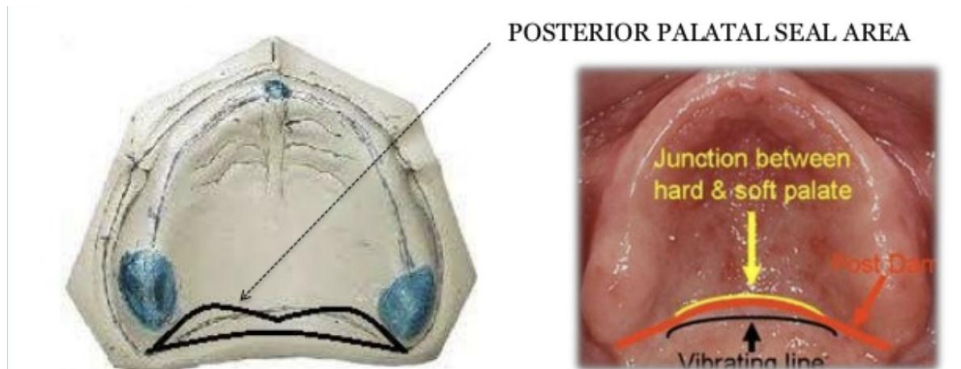
5. Hamular notch: it is a depression situated between the maxillary tuberosity and the hamulus of medial pterygoid plate. It is soft area of loose connective tissue. The denture border should extend till the hamular notch (overextension causes soreness while underextension lead to poor retention of the denture)



6. Vibrating line: it is an imaginary line drawn across the palate extends from one hamular notch to the other at the junction between movable and immovable parts of the soft palate, posteriorly to the junction of hard and soft palate. It can be identified by asking the patient to say (Ah) in a moderate manner.

Posterior palatal seal area is the soft tissue area on or beyond the junction of the hard and soft palate on which pressure within the physiologic limits of the tissue can

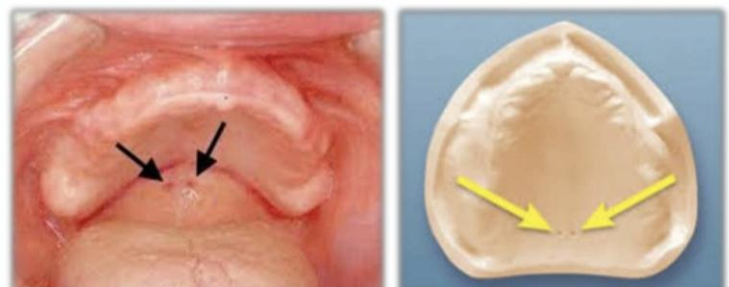
be applied by the denture to aid in the retention of the denture. The posterior border of the denture which lies in this area is called **post dam** area which form the posterior palatal seal and aid in the retention of the denture.



) Hard palate, (b) soft palate, (c) palatal extension of denture

7. Fovea palatina – two small pits or depressions in the posterior aspect of the palate, one on each side of the midline formed by a coalescence of several mucous gland ducts. They act as an arbitrary guide to locate the posterior border of the denture.

FOVEA PALATINAE



B. Supporting structures

A. Primary stress bearing area

1. Hard palate
2. Postero-lateral slopes of residual ridge

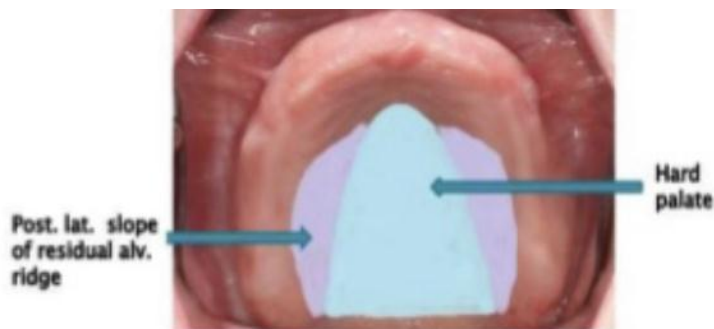
B. Secondary stress bearing area

1. Residual ridge
2. Rugae area
3. Maxillary tuberosity

A. Primary stress bearing area

1. Hard palate: the ultimate support for a maxillary denture is the bone of the hard palate which is formed of two maxillae and the palatine bone. It is considered as primary stress area because it resists resorption.

2. Postero-lateral slopes of residual ridge



B. Secondary stress bearing area

1. Residual ridge: it is defined as the portion of the alveolar ridge and its soft tissue covering which remains following the removal of teeth.

It resorbs rapidly following extraction at first and continues throughout life at a reduced rate so its shape and size change, for this the crest of the ridge may act as secondary stress-bearing area.

2. Rugae area: is a raised area of dense connective tissue radiating from the median palatine suture in the anterior 1/3 of the palate. In this area the palate is set at an angle to the R.R and it resists anterior displacement of the complete denture.



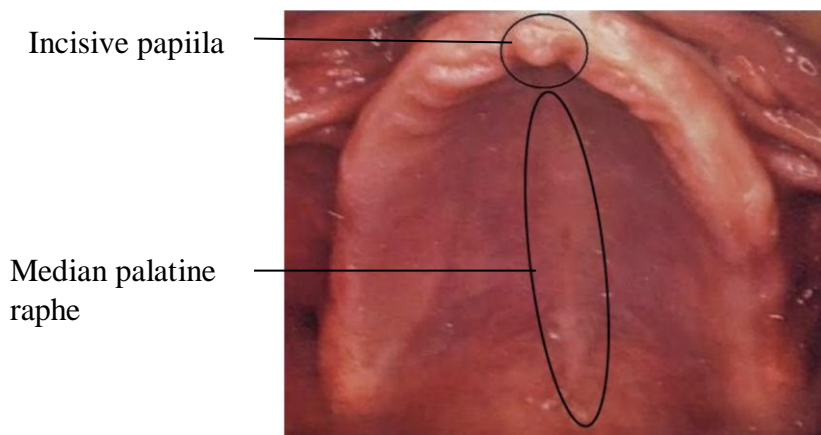
3. Maxillary tuberosity it is the distal end area of the R.R, extends from the 2nd molar area to the hamular notch. This area provides resistance to horizontal movements of the denture.

C. Relief areas

1. Incisive papillae
2. Median palatine raphe
3. Torous palatinus
4. Sharp spiny processes
5. Cuspid eminence
6. Zygomatic process

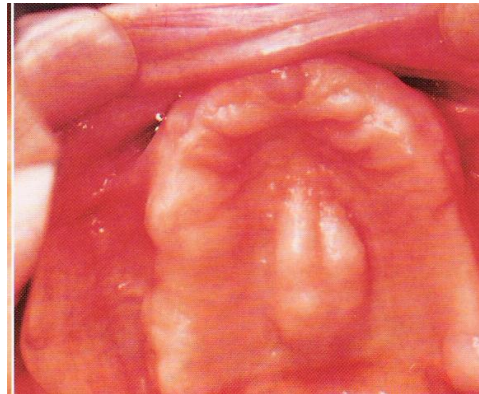
1. Incisive papillae: is a pad of fibrous connective tissue overlying the orifice of the incisive foramen. In dentulous mouth, it is located on a line immediately behind and between the two central incisors on the palatal side but in the edentulous mouth it comes to lie nearer on or labial to R.R crest due to bone resorption. The nasopalatine nerves and blood vessels pass through this foramen so relief in the denture should be done over this area if not, the denture will compress the vessels or nerves and lead to necrosis of the distributing areas and paresthesia of the anterior palate.

2. Median palatine raphe: it overlies median palatine suture which extends from incisive papillae to the distal end of the hard palate. The underlying bone union being very dense and often raised so it should be relieved during denture fabrication.



3. Torous palatinus: is a hard bony enlargement occurs in median palatine suture area and is found in about 20% of the population. It is covered by a thin layer of m.m

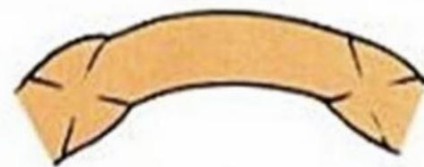
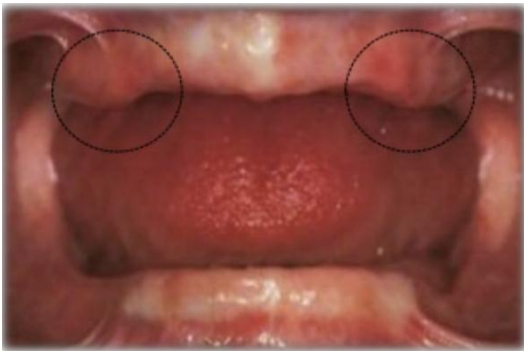
that is easily traumatized by the denture base. When the tori is small in size a relief in the denture can solve the problem but if it is too large surgical correction must be done.



4. Sharp spiny processes: which may occur on maxillary and palatine bones ,they cause no problem when covered deeply by soft tissue but due to resorption of the R.R , these sharp processes can irritate the covering soft tissues as a result of pressure from the denture base, like the sharp spiny overhanging edges of greater and lesser palatine foramina.

5. Cuspid eminence: it is a bony elevation on the residual alveolar ridge formed after extraction of the canine.

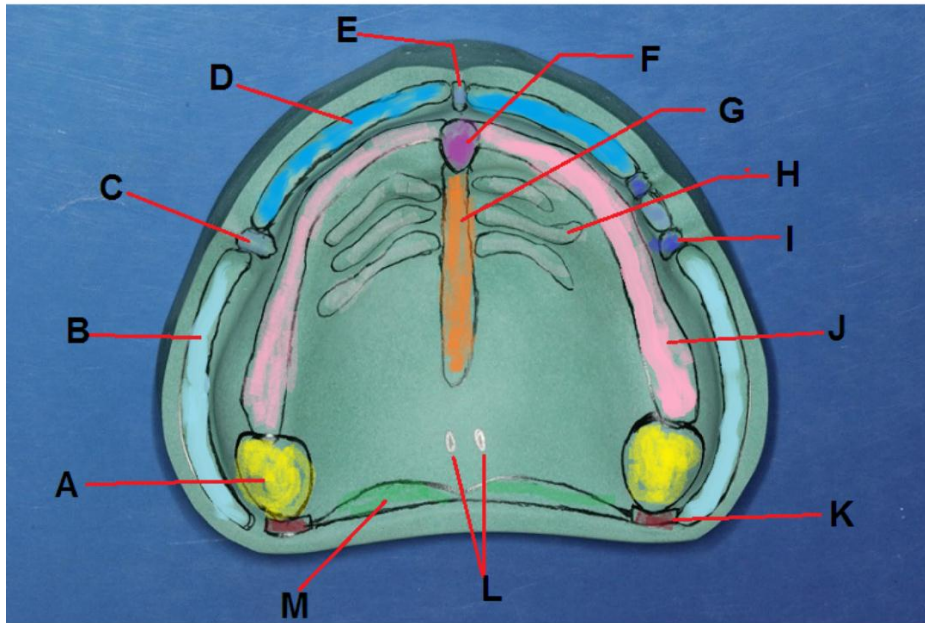
It is located between the canine and first premolar.



Cuspid Eminence

6. Zygomatic process: is located distal to buccal frenum opposite the first molar region, with increasing resorption it becomes more noticeable and the denture may require relief over this area to prevent soreness of the underlying tissues.

Anatomical landmarks of edentulous maxilla



- A- maxillary tuberosity
- B- Buccal Sulcus
- C,I- Buccal frenum
- D- Labial Sulcus
- E- labial Frenum
- F- Incisive papilla
- G- Mid palatine raphe
- H- Palatal rugae
- J- Crest of the alveolar ridge
- K- Hamular notch
- L- Fovea platina
- M- posterior Palatal seal

