

ANATOMICAL LANDMARKS OF THE MAXILLA AND THEIR SIGNIFICANCE IN COMPLETE DENTURE PROSTHODONTICS

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ABSTRACT

The successful fabrication of a complete denture relies heavily on a thorough knowledge and accurate record of the anatomical structures of the basal seat—the bone covered by mucous membrane. Anatomical landmarks are recognizable anatomic structures used as a point of reference. Understanding these landmarks is crucial for achieving retention, stability, and support in complete dentures, which ultimately contributes to their long-term success. This knowledge allows for maximum denture coverage without interfering with the health or function of the tissues and enables the selective placement of forces upon supporting tissues. The anatomical landmarks of the maxilla (upper jaw) are typically categorized into limiting structures, supporting structures (stress-bearing areas), and relief areas.

Keywords: Vestibules, Frenums, Retention, Maxillary landmarks, Posterior palatal seal.

INTRODUCTION

Anatomical landmarks are specific oral structures used as reference point in prosthodontics. Accurate identification of these features is crucial for achieving stability retention and support in complete dentures. Proper knowledge of these landmarks plays a key role in satisfaction and prosthesis longevity.¹

According to glossary of prosthodontic terms, Anatomical landmarks is a recognizable anatomic structure used as a point of reference.²GPT-10

Limiting Structures

These structures define the outer boundaries of the denture base and include:

Labial Frenum: A fold of mucous membrane at the midline that contains no muscle and has no action of its own. It is an attachment point for the orbicularis oris muscle.

Clinical Significance: A V-shaped notch must be recorded in the impression to accommodate the frenum without manipulation of the lip. The denture border around the notch should be cut lower and have less thickness.



Notch sensitivity-the concentration of stresses at the tip of the large frenum notch and in shallow palatal vault may have weakening effect on the acrylic resin denture base which may cause midline fracture.³

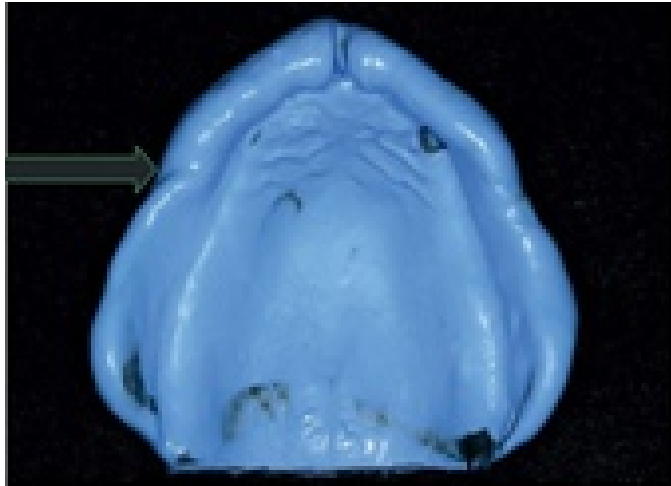
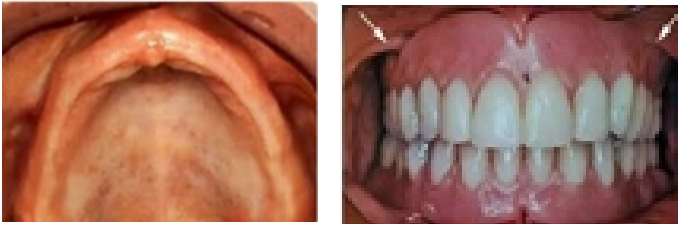
Labial Vestibule: Extends from one side of the labial frenum to the buccal frenum, housing the labial flange of the denture. Its outer surface is formed by the orbicularis oris muscle.



Clinical Significance: The vestibule is recorded by elevating the lips upwards, outwards, and then retracting them downward and inwards. Overextension in this area causes instability or soreness.

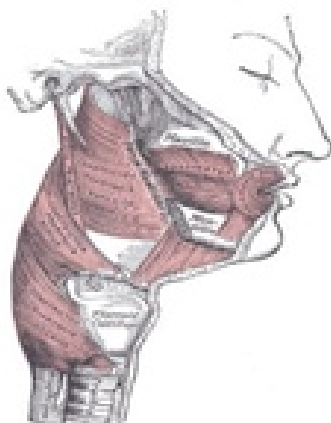
Buccal Frenum: Separates the labial and buccal vestibules and overlies the levator anguli oris muscle. It can vary in configuration.

Clinical Significance: This frenum requires more clearance for its action than the labial frenum, as it is pulled forward by the orbicularis oris and backwards by buccinator muscle.



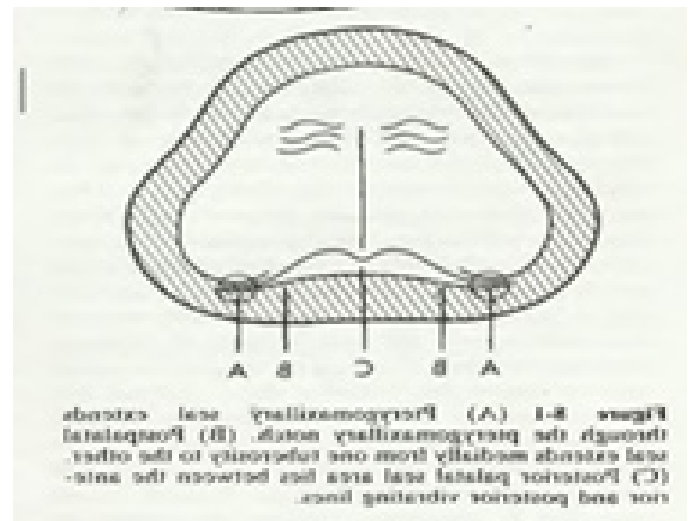
Buccal Vestibule: Extends from the buccal frenum posteriorly to the hamular notch (pterygomaxillary notch). Its size varies with the contraction of the buccinator muscle, the position of the mandible, and the amount of bone lost. **Clinical Significance:** The distal end of the buccal flange must be adjusted to accommodate the ramus, coronoid process, and masseter muscle during function, as the latter reduces the space upon contraction. **Hamular Notch (Pterygomaxillary Notch):** A depression located between the maxillary tuberosity and the hamulus of the medial pterygoid plate. The pterygomandibular ligament attaches to the hamulus.

Clinical Significance: Overextension of the denture here will interfere with the pterygomandibular raphe, potentially causing trauma to the overlying mucous membrane when the mouth is opened wide.



Posterior Palatal Seal (PPS) Area^[4]: The soft tissues along the junction of the hard and soft palates on which pressure can be applied by the denture to aid in retention. It prevents air from getting between the denture and the tissues.

Components and Boundaries: It is the area between the anterior vibrating line (at the junction of attached tissue overlying the hard palate) and the posterior vibrating line (at the musculature of the soft palate). It extends medially from one maxillary tuberosity to the other, incorporating the pterygomaxillary seal area at the hamular notch.



Fovea Palatinae: Two ductal openings for the ducts of other palatal mucous glands.

Clinical Significance: They are a guide for identifying the posterior extent of the denture, which should typically extend 1–2 mm beyond them.

Supporting Structures (Stress-Bearing Areas)

These areas are designed to tolerate the stresses produced by masticatory forces and act as the foundation for the denture base.

Primary Stress Bearing Areas:

- Horizontal Plate of Hard Palate:** Resists lateral movements and is more resistant to resorption because the tissue between the midpalatine raphe and the ridge is thick. It is made up of the palatal shelves of the maxillary bone and the underlying palatal bone.

Posterolateral Slopes of Residual Alveolar Ridge.

Secondary Stress Bearing Areas:

Rugae: Raised areas of dense connective tissues radiating from the median sutures in the anterior third of the palate. They provide secondary support by resisting the anterior

displacement of the denture.

Maxillary Tuberosity: The most distal part of the maxillary alveolar ridge, considered one of the most important areas for support.

Relief Areas

These structures require protection from excessive pressure from the denture base, as they often contain nerves, vessels, or are covered by thin, non-resilient tissue.

Incisive Papilla: Located on the midline behind and between the central incisors, containing the nasopalatine vessels.

The average distance between the anterior (most anterior) point of the maxillary central incisors and the posterior point of the incisive papilla to be approximately 12.45 mm.⁵

Midpalatine Raphe (Median Palatal Suture): Extends from the incisive papilla to the distal end of the hard palate. The underlying submucosa is very thin and the tissue is non-resilient, making it highly sensitive to pressure.

Torus Palatinus: Bony enlargement in the midline of the palate roof. It is covered by a thin layer of mucous membrane that is easily traumatized. If not relieved, even slight alveolar resorption can cause the denture to rest heavily on the torus, disrupting retention. If it extends to the vibrating line, surgical reduction may be necessary to achieve a posterior

palatal seal.

CONCLUSION

A thorough understanding and proper management of these landmarks during impression making and denture fabrication are essential to ensure the retention, stability, and comfort necessary for a successful complete denture. Successful accomplishment of the complete denture treatment constitutes a joint responsibility of both the doctor and the patient. Doctor should know how to execute the factors, face challenges and the most important part is that operator should have good communication skills.

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