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Anatomic landmarks in a maxillary and mandibular ridge - A clinical perspective

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Abstract

A thorough knowledge of oral anatomy helps the clinician in identifying enough landmarks that in turn act as positive guides in treatment planning. In the present article, a review of all the intraoral anatomical landmarks is been presented and analyzed

Keywords: Maxillary ridge, Mandibular ridge, Edentulism, Anatomical landmarks

Introduction

Literature Review: A total of 43 articles were downloaded & analyzed using the following mesh words maxillary ridge, mandibular ridge, edentulism & anatomical landmarks searching pubmed & science direct data bases. 08 articles were finally selected and examined as per the requirement of the present review article on anatomic landmarks in a maxillary and mandibular ridge - A clinical perspective.

In a Maxillary Arch, following anatomic Landmarks are present;

Incisive Papilla: It is a pad of fibrous connective tissue overlying the orifice of the nasopalatine canal.

Significance: Stable landmark and gives its relation to incisive foramen through which the neurovascular bundle emerge and lie on the surface of bone. It is a biometric guide giving information on positional relation to central incisors which are about 8-10 mm anterior to incisive papilla. Biometric guide which gives us information about location of maxillary canines (A perpendicular drawn posterior to the centre of incisive papilla to sagittal plane passes through canines) ^[1]

Clinical Consideration: During final impression procedure, care should be taken not to compress the papilla. Hence the incisive papilla should be relieved with a spacer. The Reason is that the Compression of blood vessels leads to the obliteration of the lumen → deprives nutrition to tissues → breakdown of tissues. Pressure on nerve causes parasthesia in the region of upper lip.

Palatal Rugae: They are raised areas of dense connective tissue radiating from the median suture in the anterior 1/3rd of the palate.

Significance: Said to be concerned with phonetics. Increase the surface area of the foundation and thus supplement the values of retention. It is the denture stabilizing area in the maxillary foundation.

Median Raphe: It is the area extending from the incisive papilla to the distal end of the hard palate ^[2]

Significance: Area of sutural joint and covered with firmly adherent mucous membrane to the underlying bone with little submucosal tissue. This sutural joint is formed by the median fusion of two maxillary processes and two horizontal plates of palatine bone.

Function of sutural joint is growth and sometimes there will be overgrowth of the bone at the sutural joint resulting in torus palatinus. The particular raphe by virtue of its location and palate with deeper vault reflects the association of Pascal's law of physics which states that pressure on a confined liquid will be transmitted undiminished and equally throughout the liquid in all directions.

Clinical Considerations: During final impression procedure this raphe is relieved in order to create equilibrium between the resilient and non-resilient tissues.

Hamular notch: It is a narrow cleft of loose connective tissue which is approximately 2mm in extent anteroposteriorly. Located by using T-burnisher [3, 4]

Significance: Constitutes the lateral boundary of posterior palatine seal area in maxillary foundation. The pterygomandibular raphe attaches to hamulus.

Clinical Consideration: Denture should not extend beyond the hamular notch, failure of which will result in: Restricted pterygomandibular raphe movement. When mouth is wide open the denture dislodges. Pterygomandibular raphe may be sandwiched below the denture.

Maxillary Tuberosity: It is the distal most part of the residual alveolar ridge and presents the hard tissue landmarks.

Significance: The last posterior tooth should not be placed on the tuberosity.

Clinical Significance: Often there is lateral and vertical growth of tuberosity and the area assumes importance when maxillary antrum extends laterally with undercuts at the tuberosity region. It is important to prevent oro-antral fistula so it is important to have radiograph before resection of the tuberosity. It can be used for the retention of the denture. Tuberosity should be resected on one side only i.e. if patient is right side chewer we should retain that sided tuberosity.

Fovea Palatinae: They are the remnants of ducts coalescence. Usually two in number on either side of the midline. They indicate the vicinity of posterior palatine seal area. It has no clinical significance.

Physiologic areas of relevance [5]

Labial Frenum: It appears as a fold of mucous membrane extending from the mucous lining of the lip to or towards the crest of residual ridge on the labial surface. It may be single / multiple. It may be narrow / broad. It contains no muscle fibres of significance.

Clinical Consideration: Sufficient relief should be given during final impression procedure and in completed prosthesis because overriding of function of frenum will cause pain and dislodgement of denture. During impression procedure the lip should be stretched horizontal outwards for the proper recording of frenum. If frenum is attached close to the crest frenectomy is done, failure of which will lead to the denture border being placed on the bone tissue which will cause decreased border seal.

Labial Vestibule: It extends on both sides of the midline from labial frenum anteriorly to the buccal frenum posteriorly. It is bounded laterally by the labial mucosa medially by maxillary residual alveolar ridge. Reflection of

the mucous membrane superiorly reflects the height. The area of mucous membrane reflection has no muscle.

Clinical Consideration: For effective border contact between denture and tissue, vestibule should be completely filled with impression material.

Buccal Frenum: Fold or folds of mucous membrane extending from mucous membrane reflection area to or towards the slope or crest of residual alveolar ridge.

Significance: Levator angulioris (caninus muscle) lies beneath it and hence influenced by other muscles of facial expression.

Clinical Consideration: During final impression procedure and in final prosthesis sufficient relief should be given for the movement of frenum because overriding of function of frenum will cause pain and dislodgement of denture. During impression procedure the cheek should be reflected laterally and posteriorly. If frenum is attached close to the crest of alveolar ridge, frenectomy is called for

Buccal vestibule: It is bounded anteriorly by the buccal frenum, laterally by the buccal mucosa and medially by residual alveolar ridge.

Significance: In the area of buccal flange of denture base where it rounds the distobuccal area of alveolar tubercle, sometimes a small muscle attachment is seen.

Clinical Consideration: During impression procedure the vestibule should be completely filled with impression material for proper border contact between denture and tissues. When the vestibular space that is distal and lateral to the alveolar tubercles is properly filled with denture flange the stability and retention of the maxillary denture is greatly enhanced. The buccal flange borders depend upon movement of ramus of mandible at the distal end of buccal vestibule and hence the patient should move the mandible laterally and protrusively to make sure the mandible does not interfere with these functions. To effectively record the maxillary buccal sulcus the mouth should be half way closed because wide opening of the mouth narrows the space and does not allow proper contouring of sulcus because the coronoid process of mandible comes closer to the sulcus.

Posterior Palatal Seal Area: This landmark presents a three dimensional seal area which supplements values of retention of maxillary denture. Anterior unit consists of as much resilient area as palpated by T-burnisher because of histologic contents. Posterior limit is revealed by the line of minimal function. Lateral limit is revealed by hamular notch area. Superior-inferior limit is revealed by the thickness of low fusing impression compound [6]

Significance: It improves retention by more than 10 times. Instills confidence in a patient to wear and retain maxillary denture. Helps in awarding of gagging reflex. Reduces learning period of wearing denture. The percentage linear shrinkage does not change its dimension.

Anatomic Landmarks in a Mandibular arch as follows;

Retromolar pad: It is the pear shaped body at the distal end of the residual alveolar ridge. Also called as retro molar triangle.

Significance: Represents distal limit of mandibular denture. It has muscular and tendinous elements. Few fibers of temporalis. Few fibers of masseter. Few fibers of buccinator. Fibers of superior constrictor muscles of pharynx. Tendinous mandibular raphe. Because of muscular tendinous elements the area should not be subjected to pressure.

Clinical Consideration: Helps in maintaining the occlusal plane. Divide retromolar pad into anterior 2/3rd and posterior 1/3rd. Posterior height of occlusal rim should not cross anterior 2/3rd. Helps in arranging mandibular posterior teeth. Draw a line from highest point in canine region to the apex of the retro molar triangle extending it to the land of the cast. The central fossa of all posterior teeth should lie on this crestal line. Teeth should not be placed on the retro molar pad.

Reason: Bone is situated in a inclined plane and hence forces are inclined anteriorly. Dislodgement of denture. Soreness of tissue.

Genial tubercle: Usually seen below the crest of the ridge.
Significance: In severely resorbed ridge it is seen above the residual alveolar ridge and hence it should be relieved. Mucosa covering the genial tubercle is thin and tightly adherent to the underlying bone.

Clinical Consideration: It should be relieved with wax spacer, failure of which will lead to ulceration.

Physiologic Areas of Relevance [7, 8]

Labial frenum: It is a fold of mucous membrane extending from mucous lining of mucous membrane of lips to or toward the crest of the residual alveolar ridge on the labial surface.

Clinical Consideration: During final impression procedure the lip has to be reflected anteriorly and horizontally. During final impression procedure and in final prosthesis provision should be made in the form of notch to prevent overriding of function which may result in laceration.

Labial vestibule: It is bounded anteriorly by labial frenum, posteriorly by buccal frenum, laterally by labial mucosa and medially by residual alveolar ridge.

Clinical Consideration: For effective border contact between denture and tissue, the vestibule should be completely filled with impression material during impression procedure.

Buccal frenum: It is a fold of mucous membrane extending from mucous membrane of buccal mucosa to or towards the crest of the residual ridge on the buccal surface. It may be single / multiple.

Significance: It is underlined by depressor anguli oris.
Clinical Consideration: During final impression procedure and final prosthesis sufficient relief should be given to prevent overriding of function of frenum which may result in laceration.

Buccal Vestibule: It is bounded anteriorly by the buccal frenum, posteriorly by the massetric notch area, medially by residual alveolar ridge and laterally by buccal mucosa.

Significance: It is an area of esthetic consideration. The buccal flange covers about 5 mm or more of fibers of

buccinator in this area but since it runs in a horizontal manner in the anteroposterior direction, it is not a dislodging factor.

Clinical Consideration: This space constitutes an area to be completely filled by impression material during impression procedure. It is necessary to limit the lateral content of buccal flange in the region where the masseter muscle is in function (anterior fibers) may push against the distal part of buccinator muscle, failure of which may cause soreness of tissue when heavy pressure is applied.

Buccal shelf area: Area of compact bone which is bounded laterally by external oblique ridge and medially by crest of mandibular ridge.

Significance: It presents an area of compact bone which by virtue of its deposition is horizontal and therefore is best suited to receive masticatory stresses in the vertical direction. It is the primary stress bearing area in the mandibular foundation.

Reason: It is horizontal and made up of cortical bone. The soft tissue and muscle attachment do not restrict coverage and extension of mandibular base. The dense closely placed trabeculae are arranged parallel.

Clinical Consideration: It is advisable to extend the impression beyond the external oblique ridge failures may be due to: Inadequate selection of impression tray. Involuntary effort on part of the operator.

Massetric notch area: It is immediately lateral to retro molar pad and continuous anteriorly to buccal vestibular sulcus.

Significance: It is due to the contraction of masseter that a depression is formed at the distobuccal corner of retro molar pad.

Clinical Consideration: When mouth is opened widely the borders cut into the tissue so it should be recorded. During impression procedure in the area of massetric notch downward pressure is applied and the patient is asked to close the mouth against the pressure. Overextension of denture causes - Dislodgement of denture and Laceration

Lingual frenum: Mucobuccal fold that joins the alveolar mucosa to the tongue.

Significance: It overlies the genioglossus muscle which takes origin from the superior genial spine on the mandible.

Clinical Consideration: Sufficient relief should be given in the final impression and the final denture to prevent overriding of function of frenum. During impression procedure touch the tip of the tongue to the incisive papilla region.

Retromylohyoid space: Located posterior to mylohyoid ridge and bounded posteriorly by the fibers of superior constrictor of pharynx.

Significance: The distolingual portion of the flange is influenced by the palatoglossus and superior constrictor muscles which on stretching constitute the retromylohyoid curtain. Constitutes the most important bracing potential in the mandibular foundation.

Clinical Consideration: Even in poorest of poor conditions this has to be recorded very critically for security of mandibular denture.

Sublingual Crescent area: The anterior portion of the lingual flange is commonly called the sublingual crescent area. It is part of floor of the mouth covering the sublingual gland.

Significance: This has specialized innervation.

Clinical Consideration: Overextension of denture in this area causes burning sensation.

Conclusion: Successful accomplishment of complete denture treatment constitutes a joint responsibility of both the operator and the patient by way of correctly participating in the treatment procedures". It is imperative that apart from the knowledge of all the above factors of anatomical and physiological relevance in treatment procedures, execution of the factors, digital dexterity and communication skills of the operator are of paramount importance. Thus, the diagnostic and clinical acumen of the operator constitute important considerations in the application of above knowledge.

References

1. Gray's Anatomy, Gray's, 39th edit. 100-1, 254
2. Human Anatomy BD. Chaurassia, 4th edit. 3, 249-53
3. Oral Histology and Embryology, Orbans, 11th edit. 17-20, 330
4. Oral histology AR. Tencate 5th edit. 33-39, 373-82.
5. Human Embryology, Inderbeer Singh, 5th edit. 126, 168
6. Prosthodontic Treatment for Edentulous Patients, Boucher, 10th edit. 92, 441
7. Syllabus of Complete Dentures, Heartwell C.M., 4th edit, 12, 13, 102, 131
8. Essentials of Complete Denture Prosthodontics, Winkler S. 2nd edit, 100, 254