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## The Diagnostic Appointment

Our goal is to teach students what to look for when diagnosing conditions that impact upon the use and prognosis of a complete denture, so that they may be better able to provide a complete denture service to their patients. First, certain anatomical features will be evaluated, and a judgment rendered as to their possible effects on the prognosis and success of a complete denture. We will identify typical landmarks that we should be able to find in all patients.

During a clinical examination, anatomical landmarks that are present in nearly every patient need to be evaluated to determine if there is any distortion, abnormality, or missing landmarks due to severe alveolar bone resorption, disease processes, previous surgical alterations, or natural physical variation that would indicate a problem area.

In the maxillary arch, we should be able to identify the incisive papilla, labial and buccal vestibules, rugae, residual ridge, maxillary tuberosity, hamular notch, palatine fovea, buccal and labial frenula, midpalatine suture, and glandular area. We should then be able to determine the vibrating line that is so important to maxillary complete denture retention.

In the mandibular arch, we should be able to identify the tongue, pterygomandibular raphe, residual ridge, buccal and labial vestibules, buccal, lingual, and labial frenula, buccal shelf, retromolar pad, retromylohyoid fossa, alveololingual sulcus, lingual tubercle, and submaxillary caruncles.

Once these landmarks have been identified, we must assess how their size, shape, location, presence or absence may affect treatment and prognosis. Patients must be informed of any situation that may affect their ability to comfortably wear their complete dentures.

The denture-bearing area is that part of the attached and unattached mucosa of the edentulous ridges upon which the dentures will rest. This area becomes progressively smaller as residual ridges resorb. Maximal biting forces in

patients with complete dentures are about 5–6 times less than patients with natural or restored teeth.

Some conditions will require preprosthetic surgery and a healing period prior to the final impression being made for complete dentures.

Many complete dentures are made in mandibles with impacted wisdom teeth and the patient may experience no trouble; however, the patient needs to be informed about the risks involved with leaving an impacted tooth in place. As the ridges resorb, the bone overlying a tooth remnant or impacted tooth will resorb away, and this area will eventually only be protected from the denture by a thin layer of mucosa. When this happens, an infection or traumatic ulcer may develop. Retained mandibular third molars commonly dehisce. Have them removed!

A torus is a benign outgrowth of bony tissue covered by a thin layer of mucosa. Some maxillary tori can be left as they are, and a denture placed over them if they are not too large and do not adversely affect the retention or function of the maxillary complete denture. This may be possible because a maxillary complete denture has a broad denture-bearing area for support in the palate. Often this is managed by placing a palatal relief chamber over the torus as papillary hyperplasia will not form over these tissues, and if these areas become traumatized, they will be slow to heal due to the limited vascularity in that area.

Mandibular tori are sometimes left in place for a tooth-borne removable partial denture (RPD). When the patient loses posterior teeth and a distal extension of the flange of the denture becomes necessary, they may fail to see the need for surgical reduction, but if these are left in place, the denture base will erode the overlying soft tissues severely, causing intense pain. A tissue conditioner may help temporarily, but it will not be a long-term fix. When immediate insertion dentures are placed over tori, patients often must suffer until the tissues heal. A second surgery may not be

recommended while the tissue is thus inflamed or not completely intact.

Exostoses are bony outgrowths on the alveolar ridge. They also pose a considerable problem for a complete denture patient. The tissue is stretched tightly over them and the undercuts they have would prevent a peripheral seal for a denture from being evenly remotely possible. Food debris generally will collect in the overhangs they provide, and denture movements will denude the soft tissue overlying them.

Tori and exostoses often show signs of trauma because of their thin epithelium and prominent profile. This is particularly true after eating a hard-crusting food such as pizza. Healing will take place slowly in these areas because of the lack of adequate vascularization. Infection will have easy access to the underlying tissues.

Inflammatory fibrous hyperplasia begins as a traumatic ulcer secondary to an ill-fitting denture flange and develops into a callous-like fibroma called an epulis fissuratum. These need to be removed and the existing denture relined with tissue conditioner to promote healing. Healing must be completed before making a final impression for a complete denture.

Inflammatory papillary hyperplasia can also occur under a denture. It can arise with or without the presence of *Candida albicans* and is caused by an ill-fitting denture, wearing the denture at night, and/or poor oral hygiene. It appears as flattened or grape-like clusters, dependent upon the pressure of a denture over the area. This often occurs under a palatal relief chamber that was placed to increase suction under a maxillary complete denture.

As resorption progresses, the maxilla shrinks upward and inward, while the mandible shrinks downward and outward, leading to more and more of a posterior crossbite. As the bone resorbs, the area involved becomes less able to tolerate the presence of a denture overlying it, due to the decreased surface area and a resulting increased instability. In a severely resorbed mandible, the inferior alveolar nerve may lie on top of the residual ridge. Any pressure on this area will be painful.

A sharp mylohyoid ridge will press against the overlying tissue and make it very tender to any pressure of even a well-fitting denture. Trauma to this area can be minimized or prevented altogether if the patient inserts the mandibular complete denture in the posterior first, then slides the denture forward and down over the anterior ridge. This is an important area, as it provides an undercut that will improve retention of the mandibular complete denture.

A flabby residual ridge is simply soft tissue that becomes soft and flabby over the knife-edged bone of the alveolar residual ridges when an advanced residual ridge

resorption occurs. It is not a good support area for a denture. This condition most often develops in the maxillary anterior region because the tongue protects the lower anterior teeth from decay. A mandibular RPD is much more stable than a mandibular complete denture (CD), so the lower anterior teeth are retained to provide retention for a mandibular RPD. This results in Kelly syndrome, otherwise known as combination syndrome.

Combination syndrome or Kelly syndrome defines a situation that develops when a steep anterior guidance angle allows minimal or no posterior contacts in working, balancing or protrusive relationships when the patient goes through the chewing cycle. This results from the denture tipping anteriorly during the chewing cycle, compressing the mucoperiosteum of the premaxilla, leading to resorption of the bone of the premaxillary area. The negative pressure in the posterior can lead to a maxillary tuberosity protuberance.

Resorption can be so severe as to require augmentation with bone grafts in order to prevent idiopathic fracture of the mandible. There are cases on record where a patient has suffered a fracture from simply falling asleep with their hand on their chin. A mandibular CD is very seldom made opposing the maxillary restored arch due to the almost impossible task of achieving bilateral balance of the denture teeth against the restored teeth and the increased forces that a patient can generate while chewing against the natural or restored teeth. This can lead to rapid resorption of the mandibular alveolar ridge.

The retromolar pad is a cushioned mass of tissue, frequently pear-shaped, located on the alveolar process of the mandible behind the area of the last natural molar tooth. It is composed of nonkeratinized loose alveolar tissue covering glandular tissue, fibers of the buccinator muscle, the superior constrictor muscles, and the pterygomandibular raphe, and the terminal part of the tendon of the temporalis muscle. Since there were no teeth beneath this area, it is usually the most stable area of the mandibular edentulous ridge and should be covered by the denture flange. Trauma from ill-fitting mandibular complete dentures or the patient failing to wear a lower complete denture when chewing can also lead to this area being soft and loose. The alveolar process, on the other hand, has had teeth which have been removed and although these areas have filled in with reparative bone, it is not as resistant to resorption.

Some severely resorbed ridges will manifest as knife-edged bone under a ridge of soft tissue that feels firm. The bone under these ridges is so small that it resembles a knife in a sheath. It is very susceptible to spontaneous fracture

and will require augmentation with a synthetic material, cadaver bone or autogenous bone graft.

House classified the posterior palate by the shape of the soft palate according to how it drapes down posteriorly, relevant to developing the posterior palatal seal in a maxillary complete denture. In his classification system, a patient with a Class I palate will be able to tolerate a complete denture easily because this palate offers the broadest range of area (5–10mm) in which to place the posterior palatal seal, but it is also the hardest to locate the exact area because of its flat curvature. A Class II posterior palate is the most common in the Caucasian population, with a range of 3–5 mm. It falls between the limitations of the Class I and the Class III palate. A Class III posterior palate has a vibrating line that is easiest to locate as it drops down suddenly, but it offers only 1–3 mm of area to place the posterior palatal seal. A patient

with a Class III palate will have the hardest time of the three in tolerating a maxillary complete denture.

Neil classified the lateral throat form by measuring the height of the lingual vestibule in the retromylohyoid region. A patient with a Neil Class I lateral throat form will have over ½ in. of depth provided and is very favorable for mandibular denture retention and stability. A Neil Class II lateral throat form falls between Class I and Class III and is less than ½ in. in depth. A Class III lateral throat form has no vestibular depth and would have an unfavorable prognosis. Generally, around three-quarters of patients will have Neil Class I lateral throat form, about one-fifth will be Class II, and only 5–6% will be Class III. The lateral throat form is bounded anteriorly by the mylohyoid muscle, laterally by the pear-shaped pad, posterolaterally by the superior constrictor, posteromedially by the palatoglossus, and medially by the tongue.

