AGE CHANGES IN MAXILLA AND MANDIBLE

**MAXILLA**
- It resorbs in *UPWARD & INWARD* direction to become progressively smaller because of the direction & inclination of the roots of teeth & alveolar processes.
- Longer the maxilla is edentulous, smaller the denture bearing area will be.
- Incisive foramen becomes closer to the residual ridge

**MANDIBLE**
- It resorbs in *DOWNWARD & OUTWARD* so as to become progressively wider thereby leading to class- III relation.

**Elderly patient**
- Resorbed ridges
- Class III relation
- Retracted tongue

**CONSEQUENCES OF RESIDUAL RIDGE RESORPTION**
- Apparent loss of sulcus width & depth.
- Displacement of muscle attachment closer to the crest of the residual ridge.
- Loss of vertical dimensions of occlusion.
- Decrease of lower facial height.
- Increase in relative prognathia.
Ant. protation of the mandible (class-III)

Changes in interalveolar ridge relationship

Location of mental\incisive foramen close to the crest of residual ridge

**Alveolar Bone**

- Loss of teeth means loss of bone.
- Loss of alveolar bone leads to loss of vertical dimension.
- Osteoporosis – seen particularly in females after menopause.
- Effects are exaggerated by malabsorption syndromes.

**AGE CHANGES IN   TEMPOROMANDIBULAR JOINT**

The cartilage of the TMJ is essentially completely replaced by bone around the 4th decade of life.

The articular tissue remains relatively unchanged in appearance throughout adulthood, it may undergo metaplastic transformation into fibrocartilage, depending on the biomechanical loading to which joint was subjected.

The articular eminence, in particular, is characterized by the presence of chondroid bone and very occasionally cartilage cell islands.

Up through the 5th decade, the mandibular fossa even becomes more deep as the articular eminence continues to grow inferiorly, however after that time the articular eminence tends to become flatter, especially in individual
who have become partially or completely edentulous and have reduced loading force on the eminence.

**Difference between young & adult condyle**

**YOUNG CONDYLE**

- Condylar head more vascular
- Neck absent
- Bone is soft & pliable
- Cartilage is predominant in the child

**ADULT CONDYLE**

- Less vascular
- Neck is thicker
- Bone is less pliable
- Fibrous tissue predominant

**Age changes in maxillary sinus**

- With growth sinus enlarge laterally under the orbit & by the 2nd year, they reach laterally to the infraorbital canals.
- By 9th year they extend to the zygomatic bones & to the level of the floor of the nasal fossae.
- Lateral growth ceases by the 15th year
- A large sinus may extend into zygomatic processes of the maxilla & into alveolar processes so that roots of molars & even premolar teeth lie immediately beneath the floor or project into it.
- In old age, bone enclosing the roots of posterior teeth sometimes resorbs leading to apex lie in the direct contact
with mucous membrane & extraction of such teeth may lead to fistula formation.

**Oral Health and General Health in the Elderly**

Oral health affects the elderly with regards to diet and nutrition intake, psychosocial interaction, and general well-being. The oral cavity is a portal of entry for microbial infections. Common oral diseases such as periodontal diseases and dental caries are the result of bacterial plaque accumulation.

**Oral Health Problem in Elderly**
- Tooth loss
- Denture related condition
- Coronal and root caries
- Periodontal disease
- Xerostomia
- Cancer and precancer

**Risk Factors Associated with Oral Diseases and Conditions in the Elderly**
Several studies suggested that 68-95% of persons 65 years or older take medication. The average number of drugs (prescription and/or non-prescription) used by this group is 1.4 to 4.3. With physiological aging and multiple pathologies, elderly patients are more susceptible to drug interactions and adverse effects. One profound side effect of multi-pharmacy is xerostomia. Without adequate salivary function, quality of life also is likely to be compromised.
Oral Manifestations of Systemic Diseases

- Evidence of a systemic disease occurring elsewhere in the body is sometimes noted in the mouth.
- Diabetes
- Cardiovascular and thromboembolic diseases
- Osteoporosis
- Respiratory Diseases
- Possible use of pulp stem cells in treating diseases

Recent correlation studies have raised concerns about the possible linkage between Oral infection/chronic inflammation and systemic disease development/progression. Bacteria from the oral flora have been recovered from infection sites in other organs of patients with aspiration pneumonia or endocarditis. The oral-systemic diseases linkage is a special health concern for the elderly since effective oral hygiene is usually compromised in patients with physical and neurological changes. Many systemic diseases and conditions have oral manifestations, which may be the initial sign of a number of clinical diseases. Oral examination and oral health evaluation should be integrated components of a routine physical examination.

Diabetes

- Increased frequency of tooth loss in diabetics associated with periodontitis
- Two-way street – each represents a risk factor for the other
- In addition to periodontitis, Type 2 diabetes related to other complications in the oral cavity including tooth decay, dry mouth, fungal infections and oral and peripheral
Neuropathies.
Diabetes is a risk factor for advanced periodontal disease and Candida infection.

**Cardiovascular Diseases**
- Linkage between periodontal disease and atherosclerosis and thromboembolic events
- Common basis for inflammatory responses, but cause and effect not established
- Independent causality.

**Osteoporosis**
- Loss of alveolar bone associated with osteoporosis
- Implication of interaction with endocrine system
- Effects of Hormonal replacement treatment (HRT).

Recent reports raise concerns that patients undergoing long-term bisphosphonate treatment for metabolic bone disease or osteoporosis might be at risk for developing osteonecrosis of the jaw (called bisphosphonate-related osteonecrosis of the jaw; American Association of Oral and Maxillofacial Surgeons 2007)

**Factors Increasing Susceptibility to Periodontal Disease**
- Systemic Diseases
- Arthritis/Poor Dexterity
- Cancer Therapy
- Medications
- Genetics
- Tobacco Use
- Poor Nutrition
- Stress/Depression
- Removable Partial Dentures
- Microorganisms

**Common Oral Diseases and Conditions in the Elderly**

Similar to the general population,
- *caries* and periodontal disease remain the two major dental problems in elderly patients.
- As gingival recession increases, resulting in dental root surface exposure to the oral environment, the prevalence of root surface caries increases in the dentate elderly population. 50%
- Candida infection and denture related lesions are common oral manifestations in geriatric patients.
- incidence of oral cancers also increases with advancing age.

**Ulcerative Lesions of the Oral Mucosa**

- Physical ulcerations
  - Traumatic ulceration
  - Radiation mucositis
- Chemical ulcerations

**Traumatic Ulcerations**

**Etiology:**
- Lip and cheek biting.
- Motor dysfunction.
- Pressure necrosis phenomenon.
- Improper tooth brushing.
- Broken teeth.
- Irritation by faulty restoration.
- Improperly fitting removable prostheses.

**Appearance:**
- Ulcer with necrotic center and inflamed periphery.

**Differential Diagnosis:**
• Aphthous ulcer, primary or secondary syphilis, erosive lichen planus, squamous cell carcinoma, and herpes simplex.

**Treatment**

Etiology must be identified and removed. If no resolution within 3-4 weeks (in elderly healing may take longer), lesion must be biopsied.

Larger lesions may require topical anesthetics, topical steroids or topical antimicrobials.

**Radiation Mucositis**

• **Appearance:**
  - Diffuse erythema on all mucosal surfaces, followed by epithelial desquamation and ulceration.
• **Differential Diagnosis:**
  - Oral candidiasis
  - Recurrent herpetic stomatitis
  - Erythema multiforme

**Treatment:**

Management of salivary gland dysfunction and candidiasis

Increase fluids and nutrients

**Chemical Ulceration**

Etiology:

• Prescription (e.g. chemotherapeutic agents, immunosuppressants)
• Nonprescription (aspirin burn) medications.
• Non-precious metal in prosthodontic appliances (cobalt-chromium and nickel-chromium alloys).

A white membranous patch that leaves a raw, painful area when scraped off.

Examples: aspirin burn, ulceration caused by drugs to treat cancer, arthritis, or prevent rejection of transplants.
Side effects of drugs used to treat systemic disease (e.g. Xerostomia, anemia, nutritional deficiency, leukopenia and lowering host defense response).

**Treatment:**
- Larger lesions may require topical anesthetics, topical antimicrobials, and topical corticosteroids.

**Indirect consequences of wearing denture**

**RESIDUAL RIDGE REDUCTION**
- Studies have established a continuous loss of the bone tissue after teeth extraction and the placement of complete dentures.
- The resorption rate varies by individual.
- Some say that RRR is physiological process that occurs because the use of the alveolar bone is lost after tooth extraction, however, RRR can proceed to the basal bone and hence is believed to be a pathological process and not a physiological one.

**GAGGING:**
- Normal, healthy defense mechanism, prevents foreign bodies from entering trachea
- Many stimuli cause gagging, such as irritation of the posterior part of the tongue, soft palate, even sights, tastes etc. can cause gagging
- Due to dentures, patient may gag initially but gets accustomed.
- Gaging may also be a symptom of disorders and diseases of the GIT, adenoids or catarrh in the upper respiratory passage.

**Overdenture abutments : caries and periodontal disease**
- The retention of selected teeth to serve as abutments under complete dentures is an excellent prosthodontic technique.
- However, bacterial colonization beneath a close fitting denture is enhances and leads to caries, due to microbial plaque of Streptomyces and Actinomyces (predominantly).
➢ If the plaque is left undisturbed, it initiates gingivitis in one to three days.

➢ Patients with overdentures demonstrate up to 30% increase in caries within one year.

➢ Preventive measures should be aimed at preventing the accumulation of plaque near the roots.

**Nutritional Deficiencies**

• Aging is often associated with a significant decrease in energy needs as a consequence of decline in muscle mass and decreased physical activity.

• There is a 30% fall in the energy however, with the exception of carbs, the nutritional requirement doesn't decrease with age.

• As a result dietary intake of elder individuals often reveals evidence of deficiencies clearly related to dental/ prosthetic status.

Severe nutritional deficiencies are rare in the healthy, even with impaired masticatory functions, it is only in hospitalized/ chronically ill patients that inability to chew and altered taste perception lead to negative dietary habits and nutritional status

**Periimplantitis**

• Soft and hard tissues surrounding osseointegrated implant show similarities with periodontium.

• Big difference in the collagen fibers being non-attached and parallel to implant surface instead of being perpendicular and in functional arrangement from bone to cementum.

• Periodontitis like process- periimplantitis affects implants and leads to loss osseointegrated implant.
• Bacteria play significant role in this, similar to periodontitis, failing implants include gingival inflammation, deep pockets and bone loss.

• Bacterial flora is gram negative rods e.g. *Bacteroides* and *Fusobacterium* sps.

Probing depths > 6mm and periimplant radiolucency

**Allergic Reactions: Intraoral Contact Allergy Reactions**

Poorly understood, not very commonly dealt with in specialized literature.

• No single or specific clinical picture of IOCA, lichenoid reactions common.

• Metals used in dental practice – e.g. amalgams, Ni base metal alloys- cause reactions, hypersensitivity consequence.

• Common allergens: 2-HEMA (hydroxyethyl methacrylate) and triethylene glycol dimethacrylate.

• Methacrylates have rarely cause oral lichenoid reactions

• Replacement of restorations containing materials that give a positive epicutaneous test is not warranted.

• Allergy due to many nonspecific or unclear intraoral clinical disorders.

**GERIATRIC PEOPLE PROBLEMS**

• **HEALTH PROBLEMS**

  1. Joint problems

  2. Impairment of special senses

  3. Cardio vascular disease
4. Cancer, Prostate enlargement,
5. Diabetes & Accidental falls

- Psychological problems
  1. Emotional problems
  2. Sexual problems
  3. Mental disorders, Senile dementia, Alzheimer’s disease

- Social problems

Poverty, Loneliness, Dependency, Isolation, Elder abuse

**Conclusion**

- ‘Placement of removable prostheses in the oral cavity produces profound changes of the oral environment that may have an adverse effect on the integrity of the oral tissues.’

- Mucosal reactions occur from the mechanical irritation, accumulation of microbial plaque and occasionally due to allergic reactions.

- Dentures that function poorly may act as negative factors in muscle function

- Surface irregularities and micro porosities can greatly encourage plaque formation.

- At times, the local irritation may end up increasing the permeability of the mucosa to allergens, hence making it difficult to distinguish between simple irritation and an allergic response.

- Some bacteria can use the PMMA as a carbon source and hence the accumulation of bacterial plaque at the interface of the denture and mucosa causes several negative effects. Good luck.