# The Examination of the Eye.

**Lecture- 4**

# The examination of the skin

* **The examination of the thyroid gland**
* **The examination of the salivary gland**

The eye is composed of different types of tissues, this unique feature makes the eye susceptible to a wide variety of diseases and provides insights into many systemic problems. **Almost any part of the eye can give important clues to the diagnosis of systemic diseases which may be evident on a routine eye examination**.

Common systemic diseases problems and their association with the eye

**1.Diabetes**

Every diabetic should have their eyes examined on diagnosis and annually thereafter.

The underlying cause of diabetic retinopathy is microvascular leakage leading to exudation which occurs in the layers of retina affecting vision. Excess glucose interferes with normal metabolism of the lens and result in premature cataracts.

**2.Hypertension**

Hypertension may produce no abnormalities if detected early but assessment of fundus is essential to detect such changes.

Hypertensive retinopathy ranges from grade 1 to grade 4, grade 4 being severe form called malignant hypertensive retinopathy. The retinal changes and swelling of the optic nerve resulting in vision loss is associated with a systolic pressure of > 220 mm Hg and a diastolic pressure of >110mm Hg.

Treatment for hypertension may result in resolution of retinal signs if left unattended for too long. Permanent damage to vision may occur because of optic nerve and retinal circulation being affected by hypertension.

Both diabetes and hypertension may also affect nerves of the eye leading to muscle paralysis causing squint, double vision,...etc.

**3.Thyrotoxicosis**

Excessive thyroid levels may cause protruding eyes, limitation of eye movements, double vision and corneal disease due to exposure and dryness. In severe form, the optic nerve may get damaged resulting in permanent loss of vision. Symptoms in the eye may appear before any other systemic features.also the dentist should notice the exophthalmus ,which is bulging of the eye anteriorly out of the orbit it could be bilateral as in Graves disease or unilateral often seen in orbital tumor complete or partial dislocation from the orbit is possible from trauma or swelling from the surrounding tissue.

**4.Cancer**

Cancer can start in the eye or spread from anywhere in the body. Cancer can occur in any part of the eye and depending upon its location it may or may not affect vision. It especially holds true in children who can have cancer called retinoblastoma. The cancer may be evident as a white reflex, squint, recurrent redness, vision loss and in advanced cases may threaten life. So, early detection and timely treatment may be both vision saving and lifesaving:

The dentist could make a diagnosis by the followings methods

**1.Naffzigers methods.** Stand behind the seated patient. Tilt the head backwards and observe the eye ball our plane of vision should be on the superciliary ridges by the examination the globes in this maner it will be possible to confirm or eliminate the presence the protruism.

Enophthalmous mean the recession of the eye usually occur in serious wasting disease

Also the followings may affected the the eye like

Sjogrens syndrome

Reiters disease

Stevens johnson syndrome

Behcets disease

# The common terminology which are used in the oral medicine for skin examination

* **Macule**: A macule is a change in surface color, without elevation or depression and, therefore, nonpalpable, well or ill-defined, variously sized, but generally considered less than either 5 or 10 mm in diameter at the widest point.
* **Patch**: A patch is a large macule equal to or greater than either 5 or 10 mm across, depending on one's definition of a macule Patches may have some subtle surface change, such as a fine scale or wrinkling, but although the consistency of the surface is changed, the lesion itself is not palpable
* [**Papule**](https://en.wikipedia.org/wiki/Papule): A papule is a circumscribed, solid elevation of skin with no visible fluid, varying in size from a pinhead to less than either 5 or 10 mm in diameter at the widest point.
* **Plaque**: A plaque has been described as a broad papule, or confluence of papules equal to or greater than 1 cm or alternatively as an elevated, plateau-like lesion that is greater in its diameter than in its depth.
* [**Nodule**](https://en.wikipedia.org/wiki/Nodule_(medicine)): A nodule is morphologically similar to a papule in that it is also a palpaple spherical lesion less than 1 cm in diameter. However, it is differentiated by being centered deeper in the dermis or subcutis.
* **Tumour:** Similar to a nodule but larger than 1 cm in diameter.
* **Vesicle**: A vesicle is small [blister](https://en.wikipedia.org/wiki/Blister), a circumscribed, fluid-containing, epidermal elevation generally considered less than either 5 or 10 mm in diameter at the widest point The fluid is clear [serous](https://en.wikipedia.org/wiki/Serous) fluid.
* **Bulla**: A bulla is a large [blister](https://en.wikipedia.org/wiki/Blister), a rounded or irregularly shaped blister containing [serous](https://en.wikipedia.org/wiki/Serous) or [seropurulent](https://en.wikipedia.org/wiki/Seropurulent) fluid, equal to or greater than either 5 or 10 mm, depending on one's definition of a vesicle.
* **Pustule**: A pustule is a small elevation of the skin containing cloudy or purulent material ([pus](https://en.wikipedia.org/wiki/Pus)) usually consisting of necrotic inflammatory cells. These can be either white or red.
* [**Cyst**](https://en.wikipedia.org/wiki/Cyst): A cyst is an epithelial-lined cavity containing liquid, semi-solid, or solid material
* **Erosion**: An erosion is a discontinuity of the skin exhibiting incomplete loss of the [epidermis](https://en.wikipedia.org/wiki/Epidermis_(skin)), a lesion that is moist, circumscribed, and usually depressed
* [**Ulcer**](https://en.wikipedia.org/wiki/Ulcer_(dermatology)): An ulcer is a discontinuity of the skin exhibiting complete loss of the epidermis and often portions of the dermis and even subcutaneous fat.
* [**Fissure**](https://en.wikipedia.org/wiki/Skin_fissure): A fissure is a crack in the skin that is usually narrow but deep.
* **Wheal**: A wheal is a rounded or flat-topped, pale red papule or plaque that is characteristically [evanescent](https://en.wikipedia.org/wiki/Evanescent_(dermatology)), disappearing within 24 to 48 hours. The temporary raised bubble of taut skin on the site of a properly-delivered intradermal [injection](https://en.wikipedia.org/wiki/Injection_(medicine)) is also called a welt, with the ID injection process itself frequently referred to as simply "raising a wheal" in medical texts.
* [**Telangiectasia**](https://en.wikipedia.org/wiki/Telangiectasia): A telangiectasia represents an enlargement of superficial blood vessels to the point of being visible
* **Burrrow**: A burrow appears as a slightly elevated, grayish, tortuous line in the skin, and is caused by burrowing organisms.

### Secondary lesions

* **Scale**: dry or greasy laminated masses of [keratin](https://en.wikipedia.org/wiki/Keratin) that represent thickened stratum corneum.
* **Crust**: dried serum, pus, or blood usually mixed with epithelial and sometimes bacterial debris.
* **Lichenification**: epidermal thickening characterized by visible and palpable thickening of the skin with accentuated skin markings
* **Excoriation**: a punctate or linear [abrasion](https://en.wikipedia.org/wiki/Abrasion_(medical)) produced by mechanical means (often scratching), usually involving only the epidermis, but commonly reaching the [papillary dermis](https://en.wikipedia.org/wiki/Papillary_dermis).
* **Induration**: dermal thickening causing the cutaneous surface to feel thicker and firmer.
* **Atrophy**: refers to a loss of tissue, and can be epidermal, dermal, or subcutaneous. With epidermal atrophy, the skin appears thin, translucent, and wrinkled. Dermal or subcutaneous atrophy is represented by depression of the skin.
* **Maceration**: softening and turning white of the skin due to being consistently wet.
* **Umbilication**: formation of a depression at the top of a papule, vesicle, or pustule

"Configuration" refers to how lesions are locally grouped ("organized"), which contrasts with how they are distributed .these terminology is important to understand the different forms of the diseases in the later lectures

* **Agminate**: in clusters
* **Annular** or **circinate**: ring-shaped
* **Arciform** or **arcuate**: arc-shaped
* **Digitate**: with finger-like projections
* **Discoid** or **nummular**: round or disc-shaped
* **Figurate**: with a particular shape

# Abnormal Color of The Skin

* Brown (melanin). Melanin, however, is the major component of skin color ; it is the presence or absence of melanin in the melanosomes in melanocytes and melanin in keratinocytes that is responsible for epidermal pigmentation.
* The presence of melanin in macrophages or melanocytes in the dermis that is responsible for dermal pigmentation. Two groups of pigmentary disorders are commonly distinguished: the disorders of the quantitative and qualitative distribution of normal pigment and the abnormal presence of exogenous or endogenous pigments in the skin. The first group includes hyperpigmentations, which clinically manifest by darkening of the skin color, and leukodermia, which is characterized by lightening of the skin.
* yellowish of the skin brownish of **skin and earthy in color**

**Other points to be noticed in the skin**

* **Sweating usually in hyperthyroidism,psychonearoces cold clammy skin**
* **dry skin mostly in fever ,hypothyroidism,dehydration.**
* **Pigmentation of the skin in the Addison disease .adrenal insufficiency**

**Also may occur in the followings:**

* **Arsenic poising**
* **Chronic liver disease**
* **Therapeutic irradiation**
* **Intestinal irradiation**
* **Intestinal malabsorption**
* **Malignant cochexia**
* **Gangrene may lead to blackness**
* **Flashings of the skin may be occur due to emotional causes hormone imbalance ,fever hyperthyroidism**

**Physical Examination of The Thyroid Gland**

Accurate physical examination of the thyroid gland and the neck, together with a palpation of the radial pulse and a look at the patient, can easily make a correct pathological diagnosis in the majority of cases.  The thyroid scan, the serum T4 and T3 determination, and the ultrasound rarely improve the accuracy of the clinical diagnosis that is derived mainly from physical examination.

Physical examination, however, to be useful in the evaluation of thyroid diseases, must be accurate. It must be accurate in determining the size of the thyroid gland, whether it is enlarged or not.  It must be accurate in detecting nodules in the thyroid gland whether solitary or multiple.  It must be accurate in determining the consistency of an enlarged thyroid gland as well as the consistency of the nodules, *whether cystic, soft, firm, or hard*. Lastly, it must be accurate in determining the presence of enlarged cervical lymph nodes, their size, and their consistency. Together with the other physical findings outside the neck area, like tachycardia and exophthalmos, and together with the history, one can readily make an accurate assessment of the patient’s apparent thyroid complaint as to:

1) whether the patient has no enlarged thyroid gland,

2) whether the patient is hyperthyroid,

3) whether the patient has a benign or malignant thyroid condition.

Physical examination of the thyroid gland as well as the neck area is not really easy. It requires gentleness in palpation. It requires diligence and care in detecting and describing all possible abnormalities in the thyroid gland and in the neck. Most important of all, it requires constant practice associated with a clinicopathological correlation to achieve accuracy.

Examination of the thyroid gland and the other’ areas of the neck should be performed from both in front and behind the patient.  Inspection and palpation are two most important parts of the physical examination of the neck. In front of the patient, the dentist inspects and palpates the neck. From behind, palpates the neck. The dentist inspects the neck for gross diffuse enlargement, asymmetry, skin changes, signs of inflammation, or gross nodularity.

Then palpates the thyroid gland, the other areas of the neck, and, of course, the gross abnormality noted on inspection. On palpation, tries to determine whether the thyroid gland is enlarged or not and whether a nodule or nodules on the neck are parts of the thyroid gland proper. The thyroid gland and any nodule on the gland are more easily palpable by the examiner’s fingers when the patient is asked to swallow saliva or small quantities of fluid repeatedly during the examination. A normal thyroid gland is rarely palpable. An enlarged thyroid gland is readily palpable. Any nodule on the neck near the area where the thyroid gland is normally located and which moves with deglutition can be said to constitute part of a primary thyroid pathology.

While palpating an enlarged thyroid gland and thyroid nodule(s), the examiner determines whether the pathology involves the right lobe, the left lobe, the isthmus or the pyramidal lobe and whether it is singly lobular, bilobular, or generalized glandular enlargement. the dentist also notes down the consistency of a diffusely enlarged thyroid gland in terms of hard, firm, and soft, and *the consistency of a thyroid nodule in terms of cystic and solid. a solid thyroid nodule may be one that has purely gross tissue content, no fluid content, or one that has both tissue and fluid content.* Clinically, a cystic thyroid nodule is usually soft on palpation. However, it may be firm if it is tensely filled with fluid. A solid thyroid nodule, on the other hand, may be soft, firm, or hard on palpation.

The other things that an examiner notes down when palpating the enlarged thyroid gland and the thyroid nodules are the size of the gland, the size of the nodules, and the number of nodules. He also notes down the mobility of the enlarged thyroid gland and the nodules. Mobility of a diffusely enlarged thyroid gland is best determined not so much by its movement with deglutition but by its degree of fixation to the underlying prevertebral fascia.  Normally, the whole thyroid gland and the trachea to which it is attached can be easily moved sideways over the surface of the prevertebral fascia.

The mobility of a thyroid nodule, on the other hand, is best determined by its degree of fixation to the tracheal fascia. A thyroid nodule that is not adherent to the tracheal fascia is usually movable. If the thyroid nodule has involved the tracheal fascia or at times even the prevertebral fascia, then chances are it is fixed on palpation.  Thus, mobility of a thyroid gland pathology is best determined by its degree of fixation to either the tracheal fascia or the prevertebral fascia, or both.

After palpation of the thyroid gland, the examiner then palpates the other areas of the neck. Specifically, the dentist tries to look for any enlarged lymph nodes. If there are, the dentist tries to determine whether these nodes are associated with a thyroid gland pathology or the thyroid abnormality previously noted. The size, location, consistency, and mobility of the enlarged cervical lymph nodes are determined, analyzed, and correlated with a possible or obvious thyroid pathology.

The important data that should be derived from a physical examination of the thyroid gland and the neck.

Palpation of thyroid gland and the neck.

I. Thyroid gland not palpable or barely palpable

II. Thyroid gland palpable

**A. Diffuse glandular enlargement**

* Size
* Consistency
* Mobility

**B. Nodular glandular enlargement**

* Location
* Number
* Size
* Consistency
* Mobility

III. Enlarged cervical lymph nodes

* Location
* Number
* Size
* Consistency

The examination of the salivary gland

Ascertain the following from the history:

* Which of the glands is affected? Most commonly, it is the parotid. Conditions differentially affect the different salivary glands.
* If there is swelling, is it unilateral or bilateral? Is it constant or does it come and go? Is the swelling painful? Pain may be referred to the ear or throat.
* How long has the patient experienced symptoms? Has any mass increased in size since it was first noticed?
* Are symptoms affected by eating?
* Is there a feeling of dry mouth?
* Are there systemic symptoms suggestive of infection, autoimmune disease, sarcoidosis or malignancy?
* Is there anything of relevance in the current medical and dental history, or medication and immunisation record?

**Examine the major salivary glands:**

**The parotid glands:**

* + Swellings of the parotid are apparent as a loss of the angle of the jaw. The accessory lobe may also cause a lump anterior to the ear. The deep lobe needs to be inspected and palpated through the mouth. Swelling can displace the ipsilateral tonsil. Try to differentiate between generalized swelling of the gland, which tends to be due to obstruction of the duct or inflammatory disease, or localized lumps, which are more likely to be tumors
  + Ask the patient to clench their teeth to allow palpation of the masseter. The anterior part of the parotid duct can be felt as it crosses the anterior border of the masseter muscle and occasionally a stone can be palpated in this part of the duct. Inspect the orifice of the duct in the mouth opposite the second upper molar by retracting the cheek with a spatula. Pressure on the body of the gland may lead to the extrusion of pus at the orifice in patients with parotitis.
  + Examine the facial nerve. Any facial weakness or asymmetry is highly suggestive of malignancy.

**The submandibular gland**

* + Submandibular gland pathology usually involves swelling beneath and anterior to the angle of the jaw.
  + Inspect the orifices of the duct by asking the patient to lift their tongue to the roof of the mouth, noting the presence of inflammation or pus or indeed a visible impacted stone.
  + Examine bimanually with the index finger of one hand inside the mouth and fingers of the other hand over the outer surface of the lump in the neck. Under normal circumstances, the gland is not palpable but, if enlarged, can be felt 2-3 cm anterior to sternomastoid, below the horizontal ramus of the mandible. The gland has a rubbery consistency. The gland should not be fixed to the floor of the mouth or tongue. Check the course of the duct for a stone.
* Sublingual gland pathology may cause swelling on the floor of the mouth.

During the examination of the salivary gland the followings important notices should be taking into consideration by the dentist

* Is this swelling a salivary gland? Differentiating a swollen parotid gland and cervical lymphadenopathy may be very difficult clinically. Usually it is possible to feel in front of lymph nodes but it is impossible to get in front of the parotid. Similarly, attempt to differentiate between a submandibular swelling and superior cervical lymph nodes which are deep to sternomastoid.
* Are there signs of systemic illness - eg, malaise, pyrexia?
* Are the eyes dry? Look for keratoconjunctivitis sicca and for other features of Sjögren's syndrome, such as xerostomia and lingual papillary atrophy.
* Has tooth enamel been lost? (This can be associated with the recurrent vomiting from bulimia.)
* Is there any regional lymphadenopathy?

## Terminology

* Sialadenitis refers to inflammation of a salivary gland and may be acute or chronic, infective or autoimmune.
* Sialolithiasis refers to stone-related disease within the ductal systems of a gland.
* Sialectasis refers to the dilation of a duct due to stones or strictures.

Sialadenosis refers to non-neoplastic non-inflammatory swelling with acinar hypertrophy and ductal atrophy.