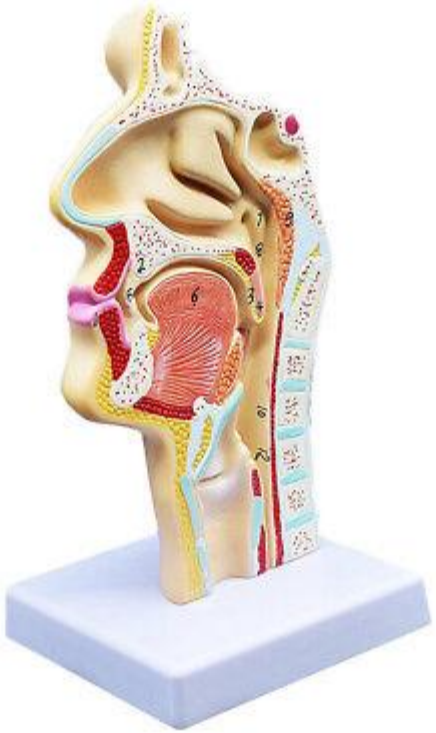
وزراة التعليم العالي والبحث العلمي
كلية المعارف الجامعة
قسم المختبرات الطبية

Oral cancer
Tongue cancer



Histopathology

المرحلة الرابعة

Introduction

- Oral cancer can be referred to as the cancer present in the oral cavity

  in which 90% of these cancers are squamous cell carcinoma

Pathology of classical or conventional squamous cell carcinoma

- Most cancers of the oral cavity are classical or conventional squamous cell carcinoma.
- This type of SCC starts in the squamous epithelium, which lines the oral cavity and occurs most often on the lower lip, tongue and floor of the mouth.
- The microscopic features of classical SCC involve Keratin pearls
- These are circular layers of squamous cells that surround keratin (a tough fibrous protein).
- Cancer starts in the squamous cells of the epithelium, and then invades the deeper layers of the oral cavity.

The most common sites of the oral cavity that are prone to developing oral cancer include: –

- Lips
- Floor of the Mouth
- Soft Palate
- Tongue

 The soft tissues of the oral cavity are covered by stratified squamous epithelium.

 The oral epithelium plays an essential role in the protection of the underlying tissues against: –

 The loss of fluids.

 The penetration of potentially harmful environmental agents such as enzymes, microbial toxins & carcinogens from foods

Definition of Oral Cancer:

– An imbalance between cell proliferation and apoptosis which is the programmed cell death results in the development of cancer in susceptible patients.

– Thus, cancer can be referred to as the uncontrollable growth of the tissue in these patients.

- **Apoptosis** is the process of programmed cell death. It is used during early development to eliminate unwanted cells; for example, those between the fingers of a developing hand.

Risk factors for the development of oral cancer include:

- **Smoking.** Cigarette, cigar, or pipe smokers are six times more likely than nonsmokers to develop oral cancers.
- **Smokeless tobacco use.** Users of dip, snuff, or chewing tobacco products are 50 times more likely to develop cancers of the cheek, gums, and lining of the lips.
- **Excessive consumption of alcohol.** Oral cancers are about six times more common in drinkers than in nondrinkers. Using alcohol and tobacco together increases your chances even more.
- **Family history of cancer.**
- **Excessive sun exposure,** especially at a young age. Ultraviolet radiation from the sun can cause lip cancers.
- **Human papillomavirus (HPV).** Certain HPV strains are etiologic risk factors for Oropharyngeal Squamous Cell Carcinoma (OSCC). Almost everyone who's sexually active will get HPV at some point in life. A specific type of this virus is causing a growing number of otherwise healthy men under 50 to get cancers in the back of their mouths and throats from oral sex. The more people you and your partners have sex with, the bigger your risk.
- **Age.** Oral cancers can take years to grow. Most people find they have it after age 55. But more younger men are getting cancers linked to HPV.
- **Gender.** Men are at least twice as likely as women to get oral cancer. It could be because men drink and smoke more than women do.
- **Poor diet**. Studies have found a link between oral cancer and not eating enough vegetables and fruits.

Genetics

- The development of oral cancer is the result of multiple genetic mutations.
- These mutations include:
  - Tumor suppressor genes (TSGs)
  - Oncogenes

Tumor suppressor genes (TSGs)

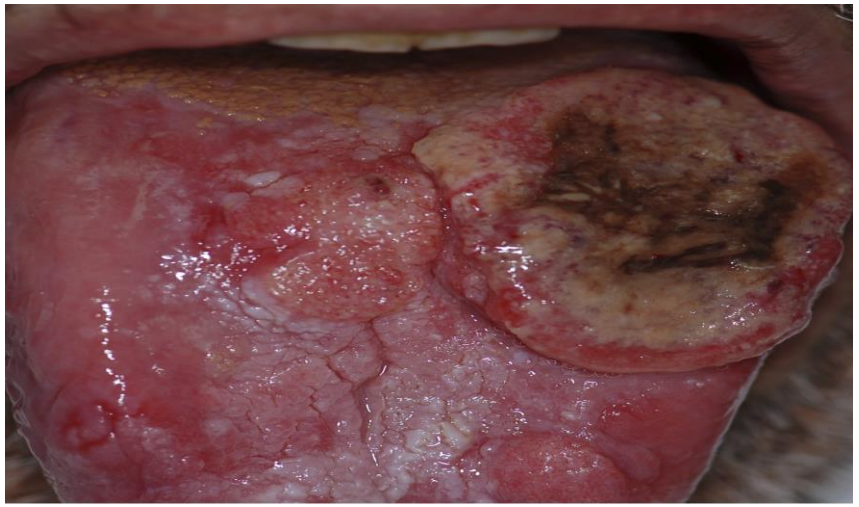
- Oral cavity cancer may be the result of an allelic imbalance, which is caused by chromosomal changes- particularly in chromosome 3, 9, 11 and 17.
- These changes lead to mutation in tumor suppressor genes (TSGs).
- Mutation most commonly occurs in one of the following:
  - Short arm of chromosome 3
  - TSG termed *P16* on chromosome 9
  - TSG termed *TP53* on chromosome 17
- n western countries (eg. United Kingdom, United States, or Australia), *TP53* mutations are the most common molecular change that leads to oral squamous cell carcinoma.

Oncogenes

- Cancer may also occur if there is mutation in other genes that control cell growth, typically oncogenes.
- Oncogenes most commonly involved are:
  - Chromosome 11
  - Chromosome 17

Gross Pathology

- Squamous cell carcinoma is the most common malignancy of the oral cavity.
- It typically has three gross morphological growth patterns, which are exophytic, ulcerative, and infiltrative.
- The infiltrative and ulcerative are the growth patterns most commonly observed in the oral cavity.
- The macroscopic appearance of oral cancer depends on the following:
  - Duration of the lesion
  - The amount of keratinization
  - The changes in the mucosa



Tongue cancer is a type of mouth cancer, or oral cancer, that usually develops in the squamous cells on the surface of the tongue. It can cause tumors or lesions. The most signs of tongue cancer are a sore on the tongue that does not heal and a painful tongue.

Applications of skin of oral cancer in oral cavity

- Skin cancer such as BASAL, SCC & melanoma can appear also in the oral cavity
- Oral squamous cell carcinoma
- Spindle cell carcinoma
- Papillary SCC
- Adenosquamous carcinoma
- Basal cell carcinoma

Clinical sing

- red or red and white patches (oral leukoplakia) that appear on the lining of the mouth or the tongue
- sores and mouth ulcers that will not heal
- a sore throat or pain when swallowing
- a feeling that there is something lodged in the throat
- a painful tongue
- difficulty moving the jaw or tongue
- neck or ear pain
- loose teeth
- swelling in the area that remains for more than three 3 weeks
- a lump in the mouth
- thickening of the lining of the mouth

Tongue cancer symptom

- The most common type of tongue cancer is called squamous cell carcinoma. Squamous cells are thin, flat cells that are present on the surface of the skin and the tongue.

- The symptoms of tongue cancer are similar to those of other oral cancers, and they may also not be evident in the early stages of the disease.
- It is also possible for people to have some of these symptoms without having tongue cancer or another type of oral cancer

Pathology

 Squamous cell carcinoma accounts for 95% of all malignant tumors in the oral cavity.

 Other malignancies involving the oral cavity include malignant salivary gland lesions, mucosal melanoma,lymphoma, and sarcoma.

 In the earliest recognizable stage, squamous cell carcinoma appears as firm, pearly plaques or as irregular, roughened, or veracious areas of mucosal thickening.

Pathophysiology

-Proliferation of abnormal cells (cell do not differentiate normally)

-Increased mass of cells

-Interference with normal tissue function

- Possible metastases

Stage

- Doctors classify most cancer types into stages according to how much cancer is present and whether or not it has spread, or metastasized, to other parts of the body.

- The classification system uses letters and numbers. The letter T indicates a tumor, and the letter N refers to neck lymph nodes. These letters each have a grading from 1–4 or 0–3 respectively.

- People with a T1 tumor have the smallest grade of tumor, while people with a T4 tumor have the largest grade.

- An N0 classification signifies that the tongue cancer has not spread to any neck lymph nodes. Tongue cancer that has spread to a significant number of lymph nodes has an N3 classification.

- It is also possible to grade tongue cancer in the following ways:

* low grade

* moderate

Stage of oral cancer

- **Stage 0 Mouth Cancer**
- Stage 0 is also called **carcinoma in situ**, and this is the very beginning of the scale. It describes abnormal cells in the lining of the lips or oral cavity, which have the potential to become cancer.
-
- **Stage I Mouth Cancer**
-
- Stage I describes a very early stage of cancer. The tumor is not more than 2 centimeters, and the cancer has not reached the lymph nodes.
-
- **Stage II Mouth Cancer**
- Stage II describes a tumor that is larger than 2 centimeters but not more than 4 centimeters. Stage II cancer has not reached the lymph nodes.
-

- **Stage III Mouth Cancer**
- Stage III mouth cancer describes cancer that either is larger than 4 centimeters or has spread to a lymph node in the neck.
-
- **Stage IV Mouth Cancer**
- Stage IV is the most advanced stage of mouth cancer. It may be any size, but it has spread to:
- nearby tissue, such as the jaw or other parts of the oral cavity
- one large lymph node (more than 3 centimeters in size) and on thesame side of the neck as the tumor, multiple lymph nodes of anysize on th e same side of the neck as the tumor, or one lymph nodeof any size on the side of the neck opposite the tumor

- distant parts of the body beyond the mouth, such as the lungs
- Mouth cancer may be stage IV when it is first diagnosed. Stage IV mouth cancer can also be recurrent mouth cancer
- (cancer that has come back after treatment).

- The cancer may recur in the part of the body where it originally developed (regional recurrence), in the lymph nodes (regional relapse), or in another part of the body (called distant recurrence).

- Stage III and stage IV cancers are more likely to recur than earlier-stage cancers.

Treatment

- Treatment for mouth cancer depends on your cancer's location and stage by many ways
-
- •Surgery
- •Radiotherapy
- •Chemotherapy
- •Targeted therapy

Radiation therapy can have a negative effect on the body.

- •Fatigue.
- •Hair loss.
- •Memory or concentration problems.
- •Nausea and vomiting.
- •Skin changes.
- •Headache.
- •Blurry vision

Chemotherapy drugs can be toxic to rapidly growing non-cancerous cells. This can cause side effects such as

- •Nausea and vomiting
- •Loss of appetite
- •Hair loss
- •Diarrhea
- •Constipation
- •Sore mouth
- •fatigue

Some of the common side effects of targeted therapy may include:

- •allergic reactions.
- •anemia and low blood counts.
- •birth defects.
- •fatigue.
- •hair loss.
- •heart damage.
- •joint or muscle pain.
- •nausea, diarrhea, vomiting and appetite
- changes, and weightless