Lec. 10 Oral Physiology Dr. Muna

**Tongue:**

Is the muscular organ which is an accessory structure of the digestive system is situated in the floor of the mouth and the anterior wall of the pharynx composed of the skeletal muscles covered with mucous membrane. The upper surface and sides of the tongue are rough because it covered with papillae while the lower surface covered with the soft mucous membrane. The anterior 2/3 of the tongue is innervated by a branch of facial nerve and the posterior 1/3 of the tongue is innervated by glossopharyngeal nerve.

**Functions of the tongue:**

The tongue is used in speech, mastication, and swallowing.

1. **a. Speech:**

The voice is produced by the vibration of the vocal cords but the sounds used in the speech are modified by changes in the shape of the passage through when these vibrations pass. The tongue plays an important role in the modification of the sounds by modification in the arrangement of the muscle’s fibers of the tongue, the entire organ may move within the mouth cavity that may be alteration of capacity of the oral cavity and the same time the tongue can be moved upwards and downwards, made it broad or concave or convex or may be carried to any point of the teeth, gums or palate. By these many movements of the tongue, the tongue is capable of changing the flow of the expired air at different position this change is responsible for formation of many sounds of speech.

1. **b.** **Mastication:**

During the mastication the food in the buccal cavity is pressed outwards between the teeth by the elevation by the tongue as well as the masticated food is finally formed into a bolus by the tongue and cheeks preparatory to the swallowing.

1. **c.** **Swallowing:**

The action of the tongue in the first stage of swallowing in the mouth by the movement of the tongue. The 1st stage is voluntary. At the beginning of the 1st stage the floor of the month, hyoid bone, and the larynx are raised by the contract of mylohyoid muscles ,Stylohyoid, thyrohyoid and digastric muscles.

The tip of the tongue first comes into contact with hard palate and then the dorsum of the tongue raised to the hard palate that effect to force of the bolus of food through the oropharyngeal part then to the pharynx.

The upward and backward movements of the tongue are assisted by the contract of the styloglossus muscles and also narrows the oropharyngeal isthmus and prevent the return of the food into the mouth.

**Taste:**

The receptors for sensation of the taste are the taste buds distributed on different areas of the tongue.

**Taste buds (papillae):** are finger like projections distributed on the dorsum surface of the tongue, they are different types:

* 1. **a. circumvallate papillae:** these papillae arranged in V-shaped in the posterior of the tongue (bitter taste).
  2. **b. Fungiform papillae (like mushroom):** are present at the apex and along sides of the tongue (salt and acid).
  3. **c. Filiform papillae**: are present in the different areas of the dorsum of tongue (sweet taste).



**The physiology of the taste sensation:**

Is sensation of the taste buds which classify according to the taste sensation into 4 basic types: bitter, acid, salt and sweat and it is not the same degree or equally respond to the stimulus listing the taste sensitivity from the greatest to the least are bitter then acid, salt and sweat. Different areas of the tongue are more sensitive to the sweat. The back to the bitter, the sides to the acid, and both the tip and sides to the salt.

**Role of the teeth arrangement in the mastication:**

Normally the teeth are arranged in each jaw to form arched curve without projection inwards or outward of the individual teeth the upper arch form elliptical shape while the lower is parabolic. When the two jaws are closed to each other that the masticatory surface fit together this known occlusion. Each tooth is occluded except the upper third molar.

**Physiology of muscles of mastication:**

**The action of the muscles of the mastication:**

The muscles of mastication are four pairs of muscles attached to the mandible and are responsible for the movement of the jaws which are as following:

**1. Mandibular protrusion:**

lateral pterygoid muscles acting together producing mandibular protrusion.

**2. Mandibular retrusion:**

The posterior and horizontal fibers of the temporalis muscle as well as the digastrics muscles will accomplish retrusion of the mandible.

**3. Lateral excursion of the mandible:**

When the left lateral pterygoid muscle contract the left condyle will be pulled forward and then the mandible will move to the right. When the right muscle contracts the mandible will move in the opposite direction.

**4. Elevation of the mandible:**

The medial pterygoid muscle and the masseter and temporalis muscle accomplish the elevation.

**5. Depression of the mandible:**

is accomplished by the hyoid muscles which are includes the supra hyoid and infra hyoid muscles.

