

## The Tubarial Salivary Gland: A Chance Discovery

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### Abstract

Salivary glands are the important structures that contribute to many of the normal physiologic processes of aerodigestive tract. These are exocrine glands that make, modify, and secrete saliva into the oral cavity, mainly to facilitate mastication, swallowing, speech, lubrication, taste perception and also helps in maintaining good oral hygiene. These are classified as major salivary glands (parotid, submandibular, sublingual glands) and minor salivary glands. Further classified as serous, mucous and seromucous glands based on their secretions. Salivary glands have already been a topic of research and interest in both health and disease. Recently a new pair of salivary glands commonly addressed as Tubarial Salivary Glands have been identified serendipitously on a fusion imaging modality. The gland is named based on the anatomic location which is found on tubarial cartilage that supports the entrance of the auditory tube. Therefore, the article aims to highlight the anatomy, physiology and various other perspectives of these Tubarial Salivary Glands and their significance in the human body.

**Keywords:** Tubarial; Tomography; Radiation Toxicity; Radiotherapy

### Tubarial salivary glands

Salivary glands are the compound, tubuloacinar exocrine glands, whose ducts opens into the oral cavity. There are three pairs of major salivary glands, namely Parotid, Submandibular, Sublingual glands, and millions of minor salivary glands that scattered throughout the oral mucosa and submucosa. They are further classified as serous, mucous and seromucous glands based on their secretions. These glands produce saliva helps in Mastication Speech, Swallowing, Lubrication, Digestion and Taste perception and to maintain good Oral hygiene [1].

A group of scientists from Netherlands Cancer Institute and University of Amsterdam while conducting the PSMA-PET scan/CT scan on Prostate Cancer patients serendipitously found a new pair of glands in the upper part of throat, behind the nose, near the Torus tubarius cartilage. They named it as Tubarial Salivary glands [2].

PSMA (Prostate Specific Membrane Antigen) PET/CT scans look for the area of the body where the PSMA protein is found. The Salivary glands sensitive to these scans, which makes them visible on scan. Along with the three pair of major salivary glands another pair of glands visible very clearly on the scan. The coronal axial, sagittal view of Tubarial salivary Glands [2].

The presence and configuration of the glands was evaluated in a retrospective cohort study of 100 consecutively scanned patients with prostate and urethral gland cancer and performed dissection studies on 2 cadaver (1-male, 1-female) to confirm the presence of the gland. All 100 patients showed the signs of this gland [1].

The gland was named based on its anatomical location. The gland was found in the lateral wall of nasopharynx overlying the torus tubarius cartilage, a cartilage that supports the entrance of auditory tubes [2]. The average length of the gland is 3.9cm (range

1.0-5.7cm). It has multiple ductal opening, which opens into dorso-lateral pharyngeal wall [3].

Histologically, it has large aggregate of mucous acini with very low number of serous acini [2].

Physiologic function of this gland is moistening and lubrication of nasopharynx and oropharynx. 3D reconstruction of tubarial salivary glands demonstrating the distribution of glandular tissue and draining ducts [1].

Clinical Implications of Tubarial Salivary Glands: These glands subjects to number of pathologic conditions as other major salivary [1]. These include, Inflammatory-sialadenitis, Infective-Bacterial, Viral, Neoplastic-Benign and Malignant.

Tubarial Salivary Glands malignancy are the most missed diagnosis due to their anatomical complexity, low incidence and clinical behaviour [4].

Radiation Therapy (RT) for head and neck cancer or brain metastasis causes damage to the tubarial salivary glands leads to radiation toxicity (e.g.: interstitial fibrosis, acinar atrophy) like other major salivary glands which results in dysphagia after radiotherapy [5].

Sparing of the gland can be achieved by IMRT (Intensity Modulated Radiation Therapy) but not possible in all patients due to their anatomical complexity [6].

### Conclusion

Tubarial salivary glands are the new organ found in the human body. In this regard the presence of Tubarial Glands as an additional salivary gland in the nasopharynx region should be considered as an important anatomical landmark for various pathological differential diagnosis affecting the head and neck region.

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