



Tubarial Salivary Gland – The New Member of Nasopharynx

Suranjana Banik, MBBS, MD,*

Manisha Rajanand Gaikwad, DGO, MD,† and Nerbadyswari Deep Bag, MMBS, MD‡

In October 2020, several journals and news sites reported the discovery of an organ in the throat—the tubarial salivary gland (TSG).¹ The gland was named for its anatomic proximity to the torus tubarius, a cartilaginous elevation near the opening of the eustachian tube.

Matthijs H. Valstar and associates noticed an unknown structure bilaterally in the posterior nasopharynx with ligand uptake like that of the major salivary glands. The discovery was made while screening prostate carcinoma patients in the Netherlands Cancer Institute using radiolabelled ligands to prostatic-specific membrane antigen (PSMA) and subsequent positron-emission tomography/computed tomography scan.² The gross features were further characterized in human cadaver dissection with the usage of histochemistry and immunohistochemistry (PSMA, alpha-amylase) and taking prostate (for PSMA) and parotid/pancreas (for amylase) samples as controls. In live subjects, magnetic resonance imaging also confirmed the presence of tubarial glands (Figs 1 and 2).²

As per the study of Valstar et al, the tubarial salivary glands had an average area of 3.9 cm and surrounded the torus tubarius. The TSG extended from the base of the skull, the fossa of Rosenmüller to the nasopharyngeal wall. The glands were having predominantly mucous acini and dose-related radiotherapy toxicity in the studied patients and have shown the presence of xerostomia and dysphagia, which implies the main function of the gland is to moisten and lubricate the nasopharynx and oropharynx.³

The TSG is similar to the sublingual gland as it is composed primarily of mucous acini with negative

amylase staining. It also has similar ligand uptake and multiple draining ducts. Unlike the major salivary glands, the TSG is unencapsulated. However, a part of the sublingual gland is also unencapsulated having 8-30 minor mixed glands and thus shares similarities with tubarial glands. High-dose external radiotherapy used in head and neck cancers or brain metastasis affects these salivary glands just like other salivary glands due to interstitial fibrosis or acinar atrophy. Tubarial salivary glands, therefore, seem to fit the characteristics of the major salivary glands.¹ However, they also share characteristics with the palatal conglomerate of minor salivary glands. Due to the overlapping features of this gland, it has been suggested that they may not necessarily be called a new organ but a macroscopic part of the composite salivary gland system having both major and minor subdivisions.¹

Salivary glands are prone to several pathologies, including neoplasms, and the same applies to tubarial glands. For example, a 5.8 × 5.1 × 3.9 cm nasopharyngeal benign minor salivary gland tumor was diagnosed as a pleomorphic adenoma. It obliterated the fossa of Rosenmüller on the left side and caused severe narrowing of the nasopharynx. It was a solid-enhancing tumor with nodular calcifications. The reporting authors speculate that the tumor is located in the expected location of the tubarial salivary gland, which extends from the base of the skull level inferiorly and could have been affecting the gland.⁴ A small infiltrating solid enhancing mass in the posterior nasopharynx anterior to torus tubaris measuring about 2.0 × 1.5 × 2.0 cm with a right retropharyngeal lymph node was reported, which involved the TSG.⁵ The initial diagnosis was a basal cell carcinoma that

*Senior Resident, Department of Anatomy, All India Institute of Medical Sciences (AIIMS), Bhubaneswar, Odisha, India.

†Additional Professor and Head, Department of Anatomy, All India Institute of Medical Sciences, (AIIMS), Bhubaneswar, Odisha, India.

‡Professor and Head of Department of Radiodiagnosis, All India Institute of Medical Sciences, (AIIMS), Bhubaneswar, Odisha, India.

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Address correspondence and reprint requests to Dr Gaikwad: Department of Anatomy, All India Institute of Medical Sciences (AIIMS), Sijua, Patrapada, Bhubaneswar, Odisha, India, 751019; e-mail: anat_manisha@aiimsbhubaneswar.edu.in

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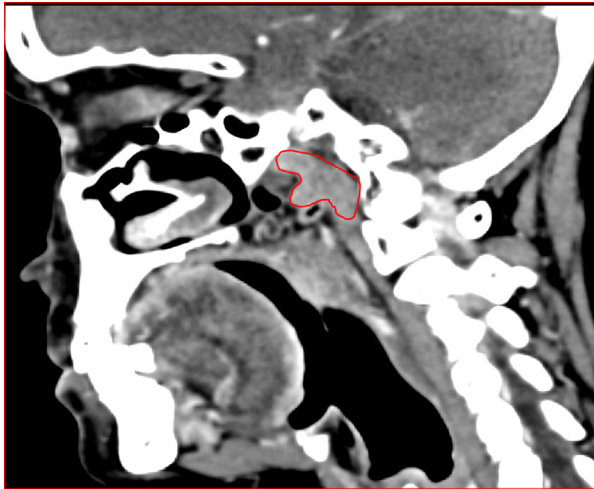


FIGURE 1. Sagittal contrast enhanced CT image showing the tubarial glands in the nasopharynx marked in red.

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extended from the right parapharyngeal space and infiltrated the skull base and the medial pterygoid muscle. Unilateral or bilateral oncocytic cysts in the torus tubaris area that have been reported earlier could be affecting the glands and secondarily causing obstruction of the eustachian tube and chronic otitis media. Tubarial glands are thought to be involved in Sjogren's syndrome and that might be the reason some patients with Sjogren's syndrome present with upper airway dryness.

The tubarial glands should not be confused with microscopic tubal glands surrounding the Eustachian tube. The study that led to their discovery showed the presence of the gland in 99 male subjects and 1 female subject of 100 patients having prostrate and urethral gland cancers, which suggests a gender disparity, and thus further studies need to be done on female subjects to gather more data.¹

The discovery of the TSG comes at a time when many believe we have discovered all gross anatomical structures. It resonates with the saying of Oscar Wilde, "To define is to limit." New research is necessary on this topic to know more about the anatomy of the gland and the pathophysiology of its diseases.



FIGURE 2. Axial T2 weighted MR image at the nasopharynx and the palate level showing tapering glands bilaterally marked in red.

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Finally, TSGs should be considered as organs at risk for radiation injury and thus should be spared from the radiation of head and neck cancers to improve post-therapy symptoms of xerostomia and dysphagia.

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