

# The Incidence of Thyroid Gland Invasion in Advanced Laryngeal Squamous Cell Carcinoma

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## Abstract

**Objectives:** To evaluate the frequency of the thyroid gland invasion in patients with advanced laryngeal squamous cell carcinoma submitted to total laryngectomy and thyroidectomy and to determine whether clinical and pathological characteristics of laryngeal carcinoma can predict glandular involvement.

**Methods:** A retrospective case series with chart review, from March 2009 to January 2018, was undertaken in the Princess Norah Oncology Center, King Abdul-Aziz Medical City, Jeddah / KSA. An inception cohort of 56 patients with laryngeal squamous cell carcinoma was considered. Nine cases were excluded. All patients had advanced stage cancer larynx (clinically T3-T4) and underwent total laryngectomy in association with thyroidectomy. Total thyroidectomy was performed in all bilateral lesions or if there was suspicion of contralateral lobe involvement. Hemithyroidectomy was performed in all lateralized lesions. Retrospective histopathologic analysis of thyroid specimens was subsequently performed. The frequency of thyroid gland invasion was calculated and analysis of demographic, clinical and pathological characteristics associated with thyroid gland invasion was performed.

This pass-sectional take a look at turned into authorised with the aid of the institutional overview board. 100 twenty 5 patients identified with T3 and T4 laryngeal squamous cellular carcinoma underwent surgical operation from January 2010 to August 2015 within the branch of Otorhinolaryngology of a tertiary medical institution. 100 eighteen sufferers underwent thyroidectomy and had been protected within the have a look at. Thyroidectomy become finished for these sufferers because of thyroid involvement primarily based on pre-operative radiologic findings and/or intraoperative findings. Histopathology specimens have been reviewed for the presence of thyroid gland involvement pathologic tumor level (T staging), tumor differentiation, tumor web page, tumor quantity, transcartilage invasion, extralaryngeal gentle tissue extension, tracheal extension, and tracheostomal involvement. Demographic and clinicopathologic characteristics of these sufferers had been acquired from the clinical charts. The relationship of the laterality of primary tumor bulk and lobe involvement was analyzed the usage of Fischer's genuine test. The association among thyroid gland invasion and different factors changed into analyzed the usage of logistic regression. All elements with p values less than or equal to zero.2 had been protected inside the multivariate analysis the usage of stepwise backward selection.

**Discussion:** The superiority of thyroid gland involvement amongst superior laryngeal squamous cell carcinoma sufferers who underwent laryngectomy with thyroidectomy was 11%. That is similar with the 1.5-12.6% mentioned inside the literature. Then again, thyroidectomy changed into done in extra than 90% of patients with advanced laryngeal squamous mobile carcinoma. This method however, isn't always without intricate complications inside the long time observe up of sufferers. Hypothyroidism is a commonplace sequela of general laryngectomy with an occurrence of 20-47.4%. The rate of submit-laryngectomy hypothyroidism is further expanded with inclusion of thyroidectomy. Alkan et al. stated the excessive prevalence of hypothyroidism (94.6%) following overall laryngectomy with

thyroidectomy. regardless of preservation of residual gland, fee of post-operative hypothyroidism remained high (22-88%) after total laryngectomy with hemithyroidectomy. due to its proximity to the larynx, the thyroid gland may additionally doubtlessly be involved in advanced laryngeal cancers, mainly by using the domestically invasive squamous cell carcinoma. The direction of spread to the thyroid gland by means of laryngeal most cancers may path thru two potential pathways: contiguous (direct invasion) and non-contiguous (lympho-vascular) unfold. The extra commonplace path observed within the examine changed into contiguous unfold (92.3%). this is regular with previous reviews, which showed the charge of direct invasion to the thyroid gland ranging from 60-100%. this may be explained through the close anatomical dating of the thyroid gland with the larynx, best separated in some factors by using skinny membranes and cartilages. Being a relatively vascular organ surrounded by way of a rich community of lymphatics, the thyroid gland may also be invaded via lympho-vascular unfold. One case within the study confirmed a small attention of squamous cellular carcinoma within the thyroid gland without an evidence of direct extension from the number one tumor. This becomes related to lymph node metastasis to the primary organization of neck nodes.

Predictors of thyroid gland involvement have been identified in several research with subglottic extension, subglottic subsite, transglottic quantity, transcartilage invasion, and extralaryngeal unfold as consistent findings related to thyroid gland involvement. The have a look at showed that extralaryngeal smooth tissue spread became predictive of thyroid gland involvement. Tracheostomal involvement and tracheal extension were extra elements associated with thyroid gland involvement now not formerly suggested in literature. it has been hypothesized that laryngeal squamous cellular carcinomas immediately invading the thyroid gland attain the organ through regions of much less resistance specially the cricothyroid membrane. Laryngeal carcinomas with transglottic volume grow laterally closer to the paraglottic space right down to the cricothyroid membrane, whereas primary subglottic cancers or those with subglottic extension invade at once thru the cricothyroid membrane. Once the tumor reaches the extralaryngeal area, the thyroid gland becomes vulnerable to direct invasion. Tracheostomal involvement and tracheal extension, particular findings inside the study, permit for thyroid gland involvement in a comparable manner.

**Results:** In all, 47 patients underwent total laryngectomy (40 treated with primary laryngectomy and seven treated with salvage laryngectomy following radiation failure or chemoradiation failure). Hemithyroidectomy was performed in 42 patients and the total thyroidectomy was performed in five patients. The overall frequency of invasion of the thyroid gland was 4.3%. Glandular involvement was seen in one advance transglottic squamous cell carcinoma and one subglottic. In spite of thyroid cartilage invasion in 25.5% of cases detected in the preoperative radiological imaging, only one case demonstrated microscopic thyroid gland invasion.

**Conclusions:** Invasion of the thyroid gland is not a general feature of advanced laryngeal carcinoma. There is no need for performing thyroidectomy in all total laryngectomy cases. The thyroidectomy may only be required during total laryngectomy for selected cases of advance transglottic tumors and tumors with subglottic extension more than 10 mm.