ABSTRACT

BACKGROUND: Squamous cell carcinoma (SCC) of the larynx and hypopharynx has the potential to invade the thyroid gland. A definition of the clinical and anatomopathological features associated with this condition would be of great value.

The objective of this work was to evaluate the frequency of thyroid gland invasion in patients with advanced SCC of the larynx or hypopharynx undergoing total laryngectomy (TL) or total pharyngolaryngectomy (TPL) associated with thyroidectomy and to determine whether clinical and anatomopathological features can predict glandular involvement.

METHODS: A retrospective study based on the review of medical records and reports of anatomopathological study of surgical specimens was undertaken. Patients undergoing TL or TPL in association with thyroidectomy for SCC of the larynx and/or hypopharynx during the period from January 1998 to July 2013 were included.

RESULTS: Ninety-three patients were included in the analysis. The overall frequency of thyroid gland invasion was 16.1%. Carcinomas that invaded the thyroid were typically large and total (p=0.005) and were more frequently staged as T4a (p=0.001). Glandular involvement was associated with invasion of the anterior commissure (OR=5.9, 95% CI 1.2–27.7), subglottis (OR=12.0, 95% CI 1.5–95.8), and thyroid (OR=4.2, 95% CI 1.1–16.1) and cricoid (OR=16.7, 95% CI 5.0–70.2) cartilages.

CONCLUSIONS: Thyroid gland invasion by neoplasia is uncommon in the context of laryngopharyngeal carcinoma. The Before mentioned clinicopathological features had a stronger association with this event. Thyroidectomy indications should be refined to decrease the morbidity associated with surgical treatment.

INTRODUCTION

Squamous cell carcinoma (SCC) of the larynx and hypopharynx has the potential to invade the thyroid gland. In spite of this risk, the proposition of either partial or total thyroidectomy as part of the surgical treatment of all such cases remains controversial.

The frequency of neoplastic involvement of the thyroid in advanced SCC of the larynx varies in the literature between 1 and 30%. According to these figures, thyroid surgery would be unnecessary in approximately 75% of patients.

The aim of this study is to evaluate the frequency of thyroid gland invasion in patients with advanced laryngeal or pharyngeal SCC undergoing total laryngectomy (TL) or total pharyngolaryngectomy (TPL) associated with hemithyroidectomy (HT) or total thyroidectomy (TT) and to determine whether clinical and pathological features are able to predict thyroid involvement.

METHODS AND MATERIALS

A retrospective cross-sectional historical cohort study was conducted based on the review of medical records and reports of anatomopathological examination of surgical specimens. All patients undergoing TL or TPL in association with HT or TT for SCC of the larynx and/or hypopharynx in the period January 1998 to July 2013 were included.

The surgeries were all performed and all patients monitored at a single Head and Neck Surgery service of a reference university hospital.

Clinical, epidemiological and anatomopathological data were analyzed for all patients. The frequency of thyroid gland invasion by the SCC was calculated. The patients were then divided into two groups: 1) patients with and; 2) without thyroid gland involvement; The two groups were compared for differences with regard to clinical and anatomopathological characteristics.

ANOVAs and Equality of Two Proportions tests were used for the statistical analysis. The degree of association between involvement of the thyroid gland and other variables was analyzed by calculating the odds ratio (OR) and its 95% confidence interval (95% CI). A value of p<0.05 was interpreted as statistically significant.

RESULTS

Data from 93 patients were reviewed and analyzed. Eighty-four (90.3%) patients were male, and nine (9.7%) were female. Mean patient age (± SD) was 59.3 ± 10.2 years. Primary tumor site was the larynx in 77 (82.8%) cases and the hypopharynx in 16 (17.2%) patients.

Thyroid gland invasion by SCC was identified in 15 patients (Figure 1).

The comparison between the groups with and without thyroid involvement revealed there was no statistically significant difference between the groups regarding gender, age, primary tumor site, N, M, and global staging, surgery performed, histologic grade of the tumor and the presence of angiolymphatic or perineural invasion.

Patients with evidence of glandular invasion showed the following characteristics:

- T4a as the most frequent pathological stage (p=0.001);
- Primary tumor of larger size (p=0.005);
- Higher rates of invasion of the following structures by the primary tumor:
  - Anterior commissure (p=0.014);
  - Subglottis (p=0.004);
  - Thyroid cartilage (p=0.026);
  - Cricoid cartilage (p=0.001).

Involvement of the pyriform sinus was statistically less frequent in patients with positive thyroid malignancy (p=0.034).

When calculating the odds ratio, invasion of the thyroid gland by SCC was positively associated with the involvement of the anterior commissure, the subglottis, and the thyroid and cricoid cartilages by the primary tumor (Table 1).

DISCUSSION

It is known that total or partial thyroidectomy greatly increases morbidity of the surgical treatment for laryngopharyngeal SCC. The occurrence of hypothyroidism and hyperparathyroidism, for example, is comprised in larger size (p=0.004).

It was demonstrated that cases with thyroid positive for carcinoma were positively associated with invasion of the anterior commissure, the subglottic region, and the thyroid and cricoid cartilages.

A meta-analysis conducted by Mendelson et al. showed that transglottic or subglottic tumors or tumors with subglottic extension > 10 mm were associated with invasion of the thyroid gland. Despite the positive association, no statistically significant correlation was identified with invasion of the cricoid and thyroid cartilages.

In a more recent study, Gaillardin et al. compared preoperative findings with the results of a histological study of the thyroid gland. They demonstrated that over 40% of patients with signs of invasion of the cricoid cartilage in computed tomography (CT) scans had histological glandular involvement by carcinoma. They concluded that this type of examination is essential in defining thyroidectomy indications.

Likewise, it is suggested that the invasion of structures more related to thyroid gland invasion should be evaluated prior to surgery using the available diagnostic methods, such as endoscopy and CT. The decision regarding the performance of thyroidectomy and its extension should be based on these findings.

CONCLUSIONS

Thyroid gland invasion by neoplasia is uncommon in the context of laryngopharyngeal SCC. Larger tumors with extra-laryngeal extension and tumors that involve the anterior commissure, subglottis, thyroid cartilage, and especially cricoid cartilage are more strongly associated with invasion of this gland. Thyroidectomy indications should be refined to decrease the morbidity associated with treatment.

REFERENCES