Hypoparathyroidism in Total Thyroidectomy due to Benign Thyroid Diseases

Burak Ertaş, MD[1]; Bayram Veyseller, MD[1]; Abdullah Karataş, MD[2]; Alper Özdilek, MD[1]; Remzi Doğan, MD[3]; and Orhan Ozturan, MD[3]

[1]Acıbadem Maslak Hospital, Department of Otorhinolaryngology, Istanbul, Turkey; [2]Haseki Training and Research Hospital, Department of Otorhinolaryngology, Istanbul, Turkey; and [3]Bezmialem Vakif University, Faculty of Medicine, Department of Otorhinolaryngology, Istanbul, Turkey

ABSTRACT

Purpose: Our aim was to compare the effects of exposing the recurrent laryngeal nerve throughout its entire course with exposing the nerve only at its entry to the larynx in patients undergoing total thyroidectomy due to benign thyroid diseases, and to evaluate the effects of these methods on the risk for hypoparathyroidism.

Methods: The medical records of 437 patients who had undergone total thyroidectomy at the ear, nose, and throat clinic between 2001 and 2015 for benign thyroid diseases were evaluated retrospectively. Mean patient age was 46.7 years (range 18–79 years). Eighty-six patients were male and 351 were female. Patients were divided into 2 groups according to recurrent laryngeal nerve exposure during surgery. In the first group, the nerve was observed as it entered the larynx, and its course was not completely exposed. In the second group, the nerve was identified in the tracheoesophageal groove, and its course was fully exposed. Group 1 consisted of 256 patients (47 male and 209 female) and group 2 consisted of 181 patients (39 male and 142 female). There were no statistically significant differences between the groups in terms of age and gender, and the groups were homogeneously distributed.

Findings: Transient hypoparathyroidism was observed in 15 (5.8%) patients and permanent hypoparathyroidism was observed in 3 (1.1%) patients in group 1, and transient hypoparathyroidism was observed in 23 (12.7%) patients and permanent hypoparathyroidism was observed in 7 (3.8%) patients in group 2. The rates of both transient and permanent hypoparathyroidism were higher in the patients in group 2, and the difference was statistically significant ($P < 0.001$). Transient recurrent nerve palsy was seen in 1 patient in each group. Permanent recurrent nerve palsy occurred in 1 patient in group 2, although the difference between groups was not statistically significant ($P = 0.28$).

Implications: Transient and permanent hypoparathyroidism were less common in thyroidectomies that involved detection of the recurrent laryngeal nerve at the site of entry to the larynx and keeping its dissection minimal; this technique was also more reliable. (*Clin Ther*. 2018;40:762–767)

Key words: hypoparathyroidism, recurrent laryngeal nerve, thyroidectomy.

INTRODUCTION

Hypoparathyroidism is one of the most important and bothersome complications after thyroidectomy. Hypocalcemia, which occurs as a result of hypoparathyroidism and can develop after the removal of the parathyroid gland or as a result of a reduced concentration of the parathyroid hormone in the blood, leads to serious problems.[1]

In recent years, total thyroidectomies have been widely performed in patients with benign thyroid diseases (eg, multinodular goiter, Basedow Graves, and oversized diffuse goiter).[2] Superior and inferior laryngeal nerves and parathyroid glands are at risk during total thyroidectomy, and the potential complications could lead to severe morbidity.

Accepted for publication April 2, 2018.
https://doi.org/10.1016/j.clinthera.2018.04.004
0149-2918/$ - see front matter

Parathyroid dysfunction may develop due to damage to parathyroid glands during total thyroidectomy.

Unnecessary dissections around the thyroid capsule during total thyroidectomy pose a significant risk for damage to both the recurrent laryngeal nerve and the parathyroid glands, which, in turn, can lead to life-long conditions that impair patient quality of life. Therefore, significant effort must be made to avoid damage to these 2 anatomical structures during total thyroidectomy.[3,4] Yet, certain postoperative morbidities develop after total thyroidectomy, despite recent advances in surgical techniques aimed at avoiding damage to the parathyroid glands.

The aim of the present study was to compare a surgical approach that involves exposing the recurrent laryngeal nerve throughout its entire course within the tracheoesophageal groove with one that involves exposing the nerve only at its site of entry to the larynx in patients undergoing total thyroidectomy for benign thyroid diseases. The effects of these methods on the risk for hypoparathyroidism were also evaluated.

METHODS

This retrospective study was approved by the Acıbadem University Ethics Committee. All patients were verbally informed about the study details and provided written consent; the study was conducted in accordance with the Declaration of Helsinki. The study included patients who had undergone total thyroidectomy due to benign thyroid diseases, such as non-malignant multinodular goiter, plunging goiter, and Basedow Graves. Patients with parathyroid disease and a history of thyroid surgery, neck radiotherapy, hypocalcemia or hypercalcemia, and chronic kidney disease, as well as those who were pregnant (due to additional metabolic changes that can affect parathyroid hormone and calcium levels) were excluded from the study. Patients with other diseases that cause hypoparathyroidism (Autoimmune Polyglandular Syndrome (APS), hemochromatosis, Wilson disease, and magnesium deficiency) were excluded from the study. The inclusion criteria were complete medical records (operative reports, patient's laboratory results, and follow-up examinations), preoperative diagnosis, available thyroid hormone levels, vocal cord assessment with fiberoptic laryngoscopy, and postoperative pathologic evaluation. Patients with multinodular goiter were evaluated from the dominant nodules using fine-needle aspiration. In the preoperative assessment, no patients had malignant findings, therefore, central region lymph node dissection was not performed.

The medical records of 437 patients who had undergone total thyroidectomy at the tertiary ear, nose, and throat clinic between 2001 and 2015 for benign thyroid diseases were evaluated retrospectively. Mean patient age was 46.7 years (range 18–79 years). Eighty-six patients were male and 351 were female. The patients were divided into 2 groups according to recurrent laryngeal nerve exposure during surgery. In the first group, the nerve was observed as it entered the larynx, and its course was not completely exposed. In contrast, in the second group, the nerve was identified in the tracheoesophageal groove and its course was exposed completely. In group 1 patients, only the entrance of the inferior laryngeal nerve to the larynx was revealed, so less nerve dissection was done. In this way, the possibility of potential hypoparathyroidism was reduced. In group 2, the inferior laryngeal nerve was dissected in the tracheoesophageal groove and, therefore, a longer dissection was performed. This may increase potential hypoparathyroidism due to wider dissection.

All thyroidectomies were performed using the extracapsular dissection technique. Group 1 consisted of 256 patients (47 male and 209 female) and group 2 contained 181 patients (39 male and 142 female). There were no statistically significant differences between the groups in terms of age and sex, and the groups were homogeneously distributed.

The preoperative clinical disease was diffuse goiter in 76 patients and bilateral multinodular goiter in 361 patients. Thyroid ultrasonography, thyroid hormones (thyroid-stimulating hormone, free T4 and T4, and thyroid antibodies), serum calcium levels, parathyroid hormone, and vocal cord movements were evaluated preoperatively in all patients. Ionized calcium levels were controlled in all patients at 8 hours and 2 days postoperatively. Vocal cord movements were evaluated on the second day using fiberoptic laryngoscopy. Patients with defective vocal cord movements underwent monthly controls for 1 year. Patients with hypocalcemia were followed up in the endocrinology outpatient clinic at 3-month intervals; those requiring