Thyroid and parathyroid dysfunctions after Total laryngectomy

HEGAZY M.A. (MD), MOHAMED S. HASSOUNA M.S. (MD), Farouk A.. (MD), HASSAN O. (MD)

Department Of Otorhinolaryngology, Faculty Of Medicine, Cairo University, Egypt

ABSTRACT

**Background:**

The proximity of the thyroid and parathyroid glands to the larynx puts them at risk in treatment of squamous cell carcinoma of this region. Hypothyroidism and hypoparathyroidism are of the complications that follow treatment of various head and neck cancers.

**Aim of work:**

To assess the incidence, and risk factors of hypothyroidism and hypoparathyroidism after total laryngectomy.

**Patients and Methods:**

Parathyroid and thyroid gland functions were evaluated in 40 patients who were diagnosed as T3, T4 cancer larynx who were treated with total laryngectomy with or without postoperative radiotherapy. It is a prospective analytic study. Serum T3, T4, TSH, and total calcium levels were performed in those patients before and after laryngectomy and were repeated one month later. The association of hypothyroidism and hypoparathyroidism was analyzed.

**Results:**

This study included 40 patients who were treated with total laryngectomy with thyroidectomy with or without postoperative radiotherapy. Twenty five patients (62.5%) had hypothyroidism proved by hypercalcemia 1 week postoperative. While 4 patients (10%) had hypothyroidism one week postoperative. Six cases need lifelong hormonal replacement.

**Conclusion:**

Thyroid and parathyroid dysfunction are common complications after total laryngectomy specially if combined with radiotherapy. They should be anticipated and treated promptly. Thyroid and parathyroid dysfunction are common complications after total laryngectomy specially if combined with radiotherapy. They should be anticipated and treated promptly.

**Keywords:** Hemithyroidectomy - cancer larynx - hypothyroidism - hypoparathyroidism

BACKGROUND

- The close anatomical and developmental relation between thyroid, and parathyroid glands and the larynx make them vulnerable in cancer larynx treatment (1).
- Resection of part of the thyroid gland for oncological reasons may injure the vascular supply of the remaining gland. Also local or proximal lymph node dissection may contribute to the devascularization of the gland (2).
- Radiotherapy cause thyroid dysfunction by parenchymal damage or microvascular endarteritis obliterans (3).
- The incidence of hypothyroidism following surgery and radiotherapy for laryngopharyngeal cancer is reported to vary from 54 to 81% (5).

OBJECTIVE

- Assess the incidence, and risk factors of hypothyroidism and hypoparathyroidism after total laryngectomy.

PATIENTS AND METHODS

A prospective study performed at faculty of medicine, Cairo University from 2011 to 2014

**Inclusion criteria:** Forty patients T3- T4 laryngeal carcinoma & candidates for total laryngectomy.

**Exclusion criteria:** T1- T2 - T4B cases, conservative laryngectomy, previous thyroidectomy, history of Iry cancer, distant metastasis.

**Surgical Techniques:**

- All cases had total laryngectomy with Thyroidectomy (hemi/ subtotal or total) preserve ≥ 1 PT gland.
- Histopathological examination of the specimens
- Statistical analysis was carried out
- Follow up by history taking & examinations, CT scan and thyroid & PTH function tests one week and one month after surgery

RESULTS

- This study included 40 patients presented with Laryngeal carcinoma T3 or T4. There were 37 males (92.5%), and 3 females (7.5%) with the mean age 61.1 years.
- There were 18 cases T3 (45%), and 22 cases were T4a (55%).
- Eight patients had previous radiotherapy treatment. 10 cases (25%) had preoperative tracheotomy.
- 33 cases (82.5%) had been subjected to hemithyroidectomy, 4 cases (10%) had subtotal thyroidectomy, 3 cases (7.5%) had total thyroidectomy, 19 patients received postoperative radiotherapy (47.5%).
- There were 33 cases (82.5%) with thyroid gland free of any pathology. 2 Cases (5%) with colloid nodules. 1 Cases (2.5%) with follicular adenoma. 4 Cases (10%) with thyroid gland invasion by laryngeal carcinoma.
- During first week postoperatively 25 patients (62.5%) had hypoparathyroidism proved by hypocalcemia 1 week postoperative. While 4 patients (10%) had hypothyroidism one week postoperative and 3 patients (7.5%) had only high TSH.
- One month post surgery 6 patients (15%) continued to have hypoparathyroidism, and 8 patients (20%) had hypothyroidism.
- Among the 8 cases that had hypothyroidism after one month; there were three cases subglottic carcinoma & 3 cases with transglottic carcinoma. Also three cases received preoperative radiotherapy. Six of them were stage T4. Three of them had total laryngectomy and three had subtotal thyroidectomy, and two had hemithyroidectomy. Three cases were poorly differentiated SCC, three were moderate differentiated SCC, and one case was adenoid cystic carcinoma of the larynx. None of them had invaded thyroid gland. Four cases 50% developed postoperative complications. Six cases need lifelong hormonal replacement.
- We founded that 2 cases (50%) with TGI developed hypocalcemia 2yr to hypoparathyroidism. There were no hypocalcemia after 1 month. There were no hypoparathyroidism either 1 week or 1 month postoperatively.
- Regarding the risk factors of developing thyroid and parathyroid gland dysfunction after cancer larynx treatment with total laryngectomy are post operative radiotherapy, and hemi or total thyroidectomy
- Also, other variables such as sex, age, neck dissection, or timing of radiotherapy were not significant risk factors. Some studies in patients with head and neck carcinoma demonstrated that hypothyroidism was more common in women (10).

CONCLUSION

Hemithyroidectomy and advanced stages of cancer larynx were risk factors in the development of hypothyroidism in treating cancer larynx patients. We need high clinical suspicion and periodic evaluation of thyroid function to diagnose post treatment hypothyroidism. Thyroid function should be periodically evaluated in total laryngectomy patients. Hypoparathyroidism is common in laryngopharyngeal carcinoma patients treated with radiotherapy alone or with radiotherapy and surgery.

For additional information please contact: [Osama Hassan - MD]
[Osama Hassan - MD]

[Department Of Otorhinolaryngology, Faculty Of Medicine, Cairo University, Egypt]