Impact of central neck dissection on postoperative parathyroid hormone levels

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Background

It has been suggested that the rate of postoperative hypocalcemia increases with the addition of central compartment neck dissection at the time of initial total thyroidectomy. The indications for and extent of routine central compartment neck dissection in well-differentiated thyroid cancer remain controversial. Our study objective was to evaluate change in postoperative rapid parathyroid hormone levels with the addition of central compartment neck dissection compared to total thyroidectomy alone and to determine the impact of central compartment neck dissection on postoperative parathyroid hormone levels and long-term hypocalcemia.

Methods

Eighty-four consecutive patients undergoing primary total thyroidectomy were included and divided into three study groups: 35 patients with well differentiated thyroid carcinoma (WDTC) who underwent central neck dissection (C+/CND+), 13 patients with WDTC without central neck dissection (C+/CND−), and 36 patients with benign disease (C−/CND−). Rapid parathyroid hormone (PTH) levels were measured immediately prior to surgery and four hours after specimen removal. The percent reduction in PTH values and percentage of patients with PTH <10ng/ml postoperatively were calculated. Statistical significance was determined using ANOVA and chi-square analyses. Relative risk (RR) for each group was determined.

Results

In our study, the mean percent reduction in PTH in the central compartment neck dissection group was 56.7%, compared to 47.0% in the carcinoma patients that did not undergo central neck dissection and 50.5% in those with benign pathology (p=0.21). Patients who underwent central neck dissection were significantly more likely to have very low postoperative PTH, for which supplemental calcium and vitamin D were initiated immediately after surgery. Postoperative PTH level <10ng/ml was found in 40%, 30.8%, and 11.8% in the C+/CND+, C+/CND−, C-/CND− groups, respectively (p=0.02). The relative risk of PTH < 10ng/ml in the C+/CND+ group was 3.6 [95%CI 1.31-9.88, p=0.007], compared to RR 2.7 [95%CI 0.81-9.50, p=0.18] in the C+/CND− group, using the C-/CND− group as reference. Only one C+/CND+ and C-/CND− patient each had prolonged hypocalcemia (>2months).

Discussion

A linear regression showed a weak association between thyroid weight and percent reduction in postoperative PTH levels. All patients with thyroid weight >40g had PTH reductions of >80%. There were no patients with permanent hypocalcemia. Typical for most thyroid neoplasms, there was a female predominance in the study group. Benign tumors were larger than malignant ones, in accord with gater as an indication for thyroidectomy.

Conclusions

Our findings suggest that patients who undergo central neck dissection during total thyroidectomy for WDTC have an elevated risk for low postoperative PTH levels in comparison to those undergoing thyroidectomy for benign disease. Measuring rapid PTH levels in the postoperative period may help guide the use of calcium supplementation to prevent short-term hypocalcemia. In our study group, the addition of central neck dissection did not have an impact on prolonged or permanent hypocalcemia.

References


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