갑상선 전절제술 후 부갑상선 기능 저하증의 발생률 및 예측

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Abstract

Incidence and Prediction of Hypoparathyroidism after Total Thyroidectomy

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INTRODUCTION : Hypocalcemia caused by hypoparathyroidism is the most common postoperative complication after total thyroidectomy. The aim of this study is to determine the incidence of hypoparathyroidism and the time course of recovery from hypoparathyroidism.

MATERIALS and METHODS : 105 patients who underwent total thyroidectomy with central compartment dissection from Jan 2011 to June 2012 in Jeju national university hospital were reviewed retrospectively. Serum PTH and calcium levels tested before and after surgery were analyzed.

RESULTS : Transient hypoparathyroidism was found in fifty-one patients (48.6%) at seond postoperative days. But most of them recovered with the course of time (15.2% in 8 weeks, 6.7% in 5 months, 2.9% in 9 months after surgery), and persistent hypoparathyroidism was remained in only one patient at one years after surgery. Preoperative PTH level showed a significant positive correlation with the PTH levels at POD#2 (Pearson r=0.277; p<0.004), but it was not a good predictor for the postoperative hypoparathyroidism in ROC curve analysis (AUC=0.507).

CONCLUSIONS : About half of patients undergoing total thyroidectomy developed hypoparathyroidism, but most of them recovered within several months. The preoperative PTH was correlated with postoperative hypoparathyroidism significantly, but it was not appropriate to predict postoperative hypoparathyroidism. (J Med Life Sci 2014;10(3):229-232)

Key Words : Hypoparathyroidism, Total Thyroidectomy, Parathyroid Hormone, Hypocalcemia

Introduction

Hypocalcemia is the most common postoperative complication after total thyroidectomy[1].

Surgical hypoparathyroidism can occur after thyroid, parathyroid or radical neck surgery for head and neck cancer. It may be transient, with recovery in days, weeks or months; permanent. Transient hypoparathyroidism occurs up to 20 percent of patients after surgery for thyroid cancer and permanent hypoparathyroidism occurs in 0.8 to 3.0 percent of patients after total thyroidectomy[2][3]. The aim of this study is to determine the incidence of hypoparathyroidism and the time course to resolution of hypoparathyroidism after total thyroidectomy.

Materials and Methods

The subject of the present study included 105 patients who underwent total thyroidectomoy with central neck node dissection by a single surgeon in Jeju national university hospital between Jan 2011 and June 2012.

We retrospectively reviewed the medical records of these 105 patients; operation records, laboratory results of PTH, serum and ionized calcium levels before and after 2nd day, 2nd, 5th, 9th and 12th months of surgery.

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Statistical analysis was performed using Pearson' s chi-square test, and logistic regression test. The predictive ability of the laboratory methods were tested with receiver operating characteristics (ROC) curves constructed using SPSS statistical software. The significance level chosen was $p < 0.05$.

Results

Most patients were female (82.9%) and the mean age was 50.0±13.4 (range 18~86) years. All patients were underwent total thyroidectomy with central neck node dissection(level Ⅵ), and modified radical neck dissection was performed in selected 8 patients who had diagnosed nodal metastasis in lateral cervical compartments(level Ⅱ~Ⅴ). All patients were diagnosed as papillary carcinoma, and the tumor size was 0.9±0.6cm (range 0.3~4.5cm). Multifocal papillary carcinoma was found in 47 patients (44.8%). Nodal metastasis in central compartment was detected in 64 patients (61.5%), and the number of nodal metastasis was 2.4±1.5 out of retrieved LN(8.0±0.7). The extrathyroidal tumor extension was found in about half patients (50.5%).

The mean PTH levels was decreased (15.3±15.3pg/㎖) at second postoperative day and fifty-one patients (48.6%) developed hypoparathyroidism (intact PTH < 15pg/㎖) (Fig. 1). But most of them recovered with the course of time(15.2% in 2 months, 6.7% in 5 months, 2.9% in 9 months after surgery). Permanent hypoparathyroidism was remained in only one patient at one years after surgery (Table 1).

There was no significant correlation between postoperative hypoparathyroidism and clinicopathologic factors such as patients' age, sex, tumor size, multifocality, nodal metastasis and extrathyroidal extension. The preoperative PTH level was significantly correlated with the PTH levels at second postoperative day (Pearson r=0.277; p<0.004, n=105), but it was not a good predictor for the postoperative hypoparathyroidism in ROC curve analysis (AUC=0.507).

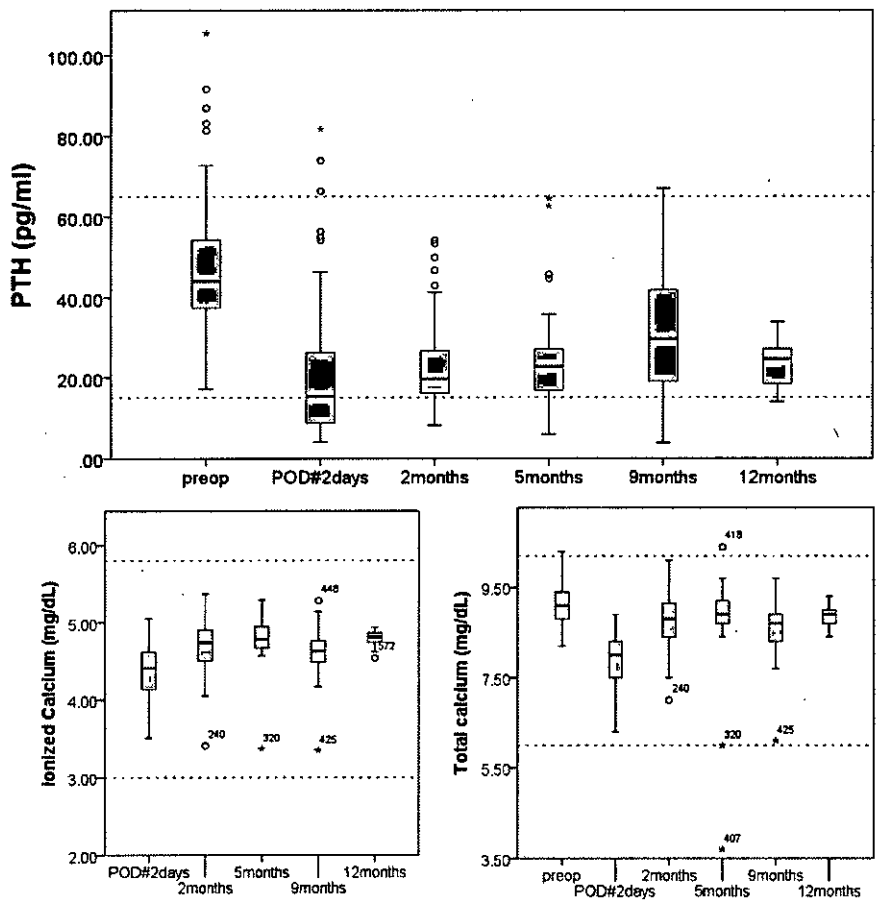

Figure 1. Laboratory findings of PTH, total and ionized calcium before and after thyroidectomy.

Table 1. Incidence of hypoparathyroidism after total thyroidectomy

Sample	POD 2 days	2 months	5 months	9 months	12 months
PTH (pg/㎖) (normal range 15~65)	20.5±15.4	22.9±10.6	24.3±12.3	32.5±16.9	22.8±6.1
No. of hypoPTH (n=105)	51 (48.6%)	16 (15.2%)	7 (6.7%)	3 (2.9%)	1 (1.0%)

Discussion

The optimal extent of nodal dissection in surgery of papillary thyroid carcinoma remains controversial. Many authors recommend central neck node dissection with total thyroidectomy, which can prevent local recurrence and reduce complication rates after surgery for local recurrence[4,5,10]. However, routine bilateral central neck node dissection is related to an increased incidence of postoperative hypoparathyroidism because of the risk of vascular compromise and inadvertent removal of parathyroid glands[7,8,9].

According to our results, about half of patients experienced the transient hypoparathyroidism, but almost patients recovered within several months. The incidence of permanent hypoparathyroidism after total thyroidectomy is less than one percent.

Routine use of oral calcium and vitamin D supplements not only reduces the incidence of hypocalcemia but also decreases the patients' hospital stays[10]. In our study, all patients routinely took oral calcium and vitamin D after total thyroidectomy and stop taking them after PTH level recovered over 15pg/㎖ during follow up. Therefore, the hypocalcemic symptoms were not found in most of patients and serum calcium levels remained within normal ranges.

We tried to find the predictive factors of the development of transient hypoparathyroidism to prevent hypocalcemia by early supplementation of oral calcium and vitamin D. The preoperative PTH level was the only factor correlated with postoperative hypoparathyroidism, but the others such as tumor size, retrieved number of lymph nodes, extrathyroidal extension were not.

In our results, the preoperative PTH level was correlated with postoperative hypoparathyroidism significantly, but we could not find the appropriate cutoff value of preoperative PTH levels to predict postoperative hypoparathyroidism. Probably many other factors which were not analyzed in this study affected and further investigation is needed to find out the appropriate predictive value for the postoperative hypoparathyroidism.

In conclusion, we found that about half of patients underwent total thyroidectomy developed hypoparathyroidism, but most of them recovered. Also we concluded that the value of preoperative PTH was correlated with postoperative PTH levels significantly, but preoperative PTH is not appropriate to predict the postoperative hypoparathyroidism.

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