Diagnosis and Surgical Treatment of Parathyroid Adenoma (24 Case Report)

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OBJECTIVE To summarize the experience in diagnosing and treating parathyroid adenoma.

METHODS Twenty-four patients were diagnosed with parathyroid adenoma and received parathyroidectomy in our hospital. Sixteen of them presented with hyperparathyroidism. The patients received ultrasounography, CT or ⁹⁹⁷⁹Tc –MIBI to locate the tumor site. Serum concentrations of PTH and calcium were checked before the operation. All operations were performed under general anesthesia. The adenomas were resected and the four glands explored.

RESULTS All of the patients were cured and there was no mortality in our group. The symptoms of hyperparathyroidism remitted to various degrees after the operation. PTH dropped to the normal range 2 days after operation. Serum calcium concentrations declined to different levels from the first day after operation. Seven patients developed hypocalcemia post-operation but recovered by injection of calcium gluconate. Only one of the patients with parathyroid adenoma recurred 2 years after the operation and was found to have malignancy of the parathyroid adenoma.

CONCLUSION Not all the patients with parathyroid adenoma had clinical manifestations. The CT and ⁹⁹⁷⁹Tc –MIBI were more accurate than ultrasounography in locating the adenoma. The four glands should be explored during the operation. Protecting the recurrent laryngeal nerve from being injured and maintaining secure hemastasis were most important.

KEYWORDS: parathyroid adenoma, diagnosis, treatment.

Parathyroid adenoma is the most common reason for hyperparathyroidism. Twenty-four patients diagnosed with parathyroid adenoma received surgical treatment in our department from January, 1997 to June, 2004. We have summarized our experience in diagnosing and treating parathyroid adenoma in the following report.

MATERIALS AND METHODS

Clinical data
This group included 10 male patients and 14 female patients with an average age of 47.2 years. The average time from the onset of the disease was 1.1 years. Sixteen patients presented with
hyperparathyroidism. The manifestations included nephrolithiasis, chronic renal failure, osteoporosis, limb muscle weakness, myalgia and fatigue. These patients had relatively long medical histories. Six patients complained of finding a painless mass in the anterior cervical region, three of which were misdiagnosed as thyroid gland adenomas. Two patients were asymptomatic, however, a mass was found in the parathyroid region by ultrasonography in a routine physical examination. Twenty-two patients had a single nodule while the other two had multiple nodules. One patient had concurrent factor X deficiency.

Imaging examination
All the patients received an ultrasound examination before operation. Seventeen were diagnosed as parathyroid adenoma while seven were misdiagnosed as thyroid adenoma. Eleven patients received a CT scan and all but one had positive findings in the parathyroid region. $^{99m}$Tc-MIBI was performed in 15 patients with hyperparathyroidism. Accumulation of MIBI was found in all of the hyperfunctional parathyroid glands.

Laboratory examination
In those patients with manifestations of hyperparathyroidism, PTH concentrations were significantly higher than normal, with the highest one being 2500 pg/ml. However, only 11 of them were hypercalcemic, ranging from 2.67 mmol/L to 4.01 mmol/L (normal range 2.2 mmol/L-2.6 mmol/L). Interestingly, three patients without clinical manifestations were found to have slightly elevated serum calcium concentrations. The concentrations of serum phosphate were slightly lower than normal, ranging from 0.66 mmol/L-0.91 mmol/L (normal range 0.8 mmol/L-1.6 mmol/L). Urinary calcium excretion was determined to be elevated in five patients with hyperparathyroidism.

Operation
All the patients received surgical treatment under general anesthesia. A transverse supraclavicular incision was selected and exposure of the thyroid gland was the same as for thyroidectomy. According to the imaging locations, the involved parathyroid gland was initially explored after the inferior artery was ligated and the thyroid gland was pushed medially. The tiny blood vessels were ligated carefully and the parathyroid gland was freed from the thyroid gland and resected, making sure that the recurrent laryngeal nerve was not injured. The tumor was then sent for a frozen-section pathological examination. The other parathyroid glands were then explored so as to rule out the possibility of concurrent pathological processes. Meticulous hemostasis was mandatory throughout the procedure. The incision was closed and routine drainage applied. A re-checking of the serum concentrations of calcium and PTH was performed 1 and 2 days after the operation.

RESULTS
All the patients were cured without mortality or morbidity in our group. The final diagnoses were a single parathyroid adenoma. Two patients with multiple nodules were finally diagnosed as a parathyroid adenoma combined with thyroid adenomas. The diameters of the adenomas resected ranged from 1 to 3 cm. Three patients who were diagnosed with thyroid adenoma before operation were found to have a parathyroid adenoma according to the postoperative pathological reports. One patient was diagnosed with a benign lesion of the thyroid gland based on the frozen-section pathological examination, but was finally diagnosed as a parathyroid adenoma according to the paraffin-section report. The level of PTH in patients with hyperparathyroidism declined to a normal range just 2 days after the operation. Most patients with hypercalcemia before the operation showed different levels of decline in their serum calcium concentrations the first day after operation. However, seven patients developed symptoms of hypocalcemia such as acanthesis, deadlimb or even tetany, but recovered after injection of calcium gluconate. The symptoms of hyperparathyroidism remitted to various degrees after the operation based