

CLINICAL FEATURES, DIAGNOSIS, AND OPTIMIZATION OF MANAGEMENT IN POST-THYROIDECTOMY HYPOPARATHYROIDISM

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Abstract. Post-thyroidectomy hypoparathyroidism (PH) is a common complication of thyroid surgery, often causing hypocalcemia and reducing quality of life. This study evaluated 60 patients undergoing thyroidectomy for incidence, clinical features, biochemical changes, and treatment outcomes of PH. Transient PH occurred in 18 patients (30%), and permanent PH in 5 patients (8.3%). The most frequent clinical manifestations were paresthesia (36.7%), muscle cramps (25%), tetany (6.7%), and positive Chvostek or Trousseau signs (16.7%). Mean serum calcium decreased from 9.3 ± 0.4 mg/dL preoperatively to 7.2 ± 0.6 mg/dL at 24 hours postoperatively ($p < 0.01$), while mean PTH dropped from 48 ± 15 pg/mL to 12 ± 6 pg/mL at 12 hours postoperatively in affected patients. Total thyroidectomy was associated with a higher PH rate (35%) compared to subtotal thyroidectomy (15%), and preservation of parathyroid glands significantly reduced hypocalcemia risk ($p < 0.05$). Intravenous calcium corrected acute hypocalcemia in 90% of patients within 24–48 hours, and oral calcium with active vitamin D maintained normocalcemia in 85% at 3 months. Individualized therapy reduced recurrent symptoms and hospital readmissions. Early diagnosis, careful surgical technique, and tailored postoperative management are crucial to optimize outcomes and prevent complications in PH patients.

Keywords: post-thyroidectomy hypoparathyroidism, hypocalcemia, parathyroid hormone, calcium supplementation, vitamin D, thyroid surgery complications, endocrine management.

Introduction. Thyroidectomy, widely performed for benign and malignant thyroid conditions, carries a risk of postoperative hypoparathyroidism due to inadvertent parathyroid injury, devascularization, or accidental removal. PH manifests as acute hypocalcemia, presenting with numbness, paresthesia, muscle cramps, tetany, and cardiac arrhythmias [1].

Chronic hypoparathyroidism may lead to basal ganglia calcifications, cataracts, nephrolithiasis, and reduced bone density. Early detection and individualized management are essential to prevent complications and optimize outcomes [2]. Current diagnostics include serum calcium, ionized calcium, phosphorus, magnesium, and PTH measurements, whereas treatment focuses on calcium and active vitamin D supplementation.

Objectives:

1. To evaluate the clinical features of PH after thyroidectomy.
2. To assess the effectiveness of biochemical markers for early diagnosis.
3. To propose optimized strategies for prevention and management of PH.

Materials and methods. A prospective study included 60 patients (48 females, 12 males, mean age 46 ± 12 years) undergoing total or subtotal thyroidectomy. Serum total calcium, ionized calcium, phosphorus, magnesium, and PTH levels were measured preoperatively, at 12 and 24 hours postoperatively, and at 1, 3, and 6 months follow-up. Clinical signs of hypocalcemia were recorded.

PH was classified as transient if calcium levels normalized within 6 months and permanent if hypocalcemia persisted beyond 6 months. Treatment protocols included intravenous calcium gluconate for symptomatic hypocalcemia, followed by oral calcium carbonate and alfacalcidol.

Statistical analysis evaluated correlations between PH incidence and surgical factors, PTH levels, and patient demographics.

Results. The incidence of post-thyroidectomy hypoparathyroidism in this study showed that transient hypoparathyroidism occurred in 18 patients, accounting for 30% of the cohort, while permanent hypoparathyroidism was observed in 5 patients, representing 8.3%. Clinically, the most frequent manifestations included paresthesia, which was reported in 22 patients (36.7%), followed by muscle cramps in 15 patients (25%).

Tetany was observed in 4 patients (6.7%), and signs such as Chvostek or Trousseau were present in 10 patients (16.7%). Biochemical assessment revealed that mean serum calcium levels decreased from 9.3 ± 0.4 mg/dL preoperatively to 7.2 ± 0.6 mg/dL within 24 hours postoperatively ($p < 0.01$). Concurrently, mean parathyroid hormone (PTH) levels dropped from 48 ± 15 pg/mL before surgery to 12 ± 6 pg/mL at 12 hours postoperatively in patients who developed hypoparathyroidism. Analysis of surgical factors indicated that total thyroidectomy was associated with a higher rate of hypoparathyroidism (35%) compared to subtotal thyroidectomy (15%).

Preservation of the parathyroid glands during surgery significantly reduced the incidence of postoperative hypocalcemia ($p < 0.05$). Regarding treatment outcomes, intravenous calcium administration corrected acute hypocalcemia in 90% of patients within 24–48 hours.

Subsequent oral supplementation with calcium and active vitamin D maintained normocalcemia in 85% of patients at the 3-month follow-up. Patients who received individualized therapy experienced fewer recurrent hypocalcemic symptoms and reduced rates of hospital readmission.

Discussion. PH remains a significant complication of thyroid surgery, with transient forms more common than permanent. Early biochemical monitoring using PTH and calcium levels enables rapid identification and treatment.

Surgical techniques emphasizing parathyroid preservation reduce PH risk. Individualized treatment protocols combining calcium and active vitamin D supplementation improve patient outcomes and minimize long-term complications. Recombinant PTH analogs may be considered in persistent cases.

Conclusion. Post-thyroidectomy hypoparathyroidism is frequent and potentially serious.

Early diagnosis using PTH and calcium monitoring, careful surgical technique, and individualized supplementation strategies optimize management, prevent acute complications, and improve quality of life. Future studies should focus on standardized treatment algorithms and novel therapeutic approaches.

References:

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