Early and Safe Management of Hypocalcemia after Thyroidectomy

Abdalla Y Bashir*
Adjunct Professor of Surgery, George Washington University, NW Washington, United States
Professor, Department of Surgery, Jordan Hospital, Amman, Queen Noor Street, Jordan

Short Communication

Hypoparathyroidism (hypoPT) hypocalcemia is the most common complication of total thyroidectomy (TT). Therefore, it is critical for the thyroid surgeon to promptly identify patients at risk and employ early strategies to control symptoms, avoid long-term consequences, and contain cost [1-4]. Various management strategies are employed including serial monitoring of post-operative serum calcium, routine, or selective calcium supplementation, and recently iPTH monitoring [5-7]. The normal short half-life of iPTH (3-5 min) along with the fragile nature of the parathyroid gland can lead to hypoPT within minutes of surgical treatment and can precede a drop in serum calcium which may take 48-72 hrs., to reach its minimum leading to increased hospitalization, cost [1-3, and 8] and serial investigations.

A prospective study [9] was done in two phases to define the optimal iPTH cut-off threshold after TT predictive of hypoPT hypocalcemia to allow prompt timely therapy of patients at risk and safe 24 hrs., discharge. Phase I included 175 patients. Predictors of symptomatic hypocalcemia were analyzed. Univariate analysis showed that post-operative iPTH was the only significant variable that can predict symptomatic hypocalcemia, (P > .001), while post-operative 24-hour serum calcium level was not (P=.059), in addition to age gender, etiology of thyroid disease, neck dissection, or inadvertent parathyroid removal.

Using Receiver Operator characteristic curve (ROC) and Youden index the confirmed optimal cut-off threshold predictive of hypocalcemia was iPTH 19.95 pg/mL with AUC of 0.903 (CI 0.852-0.954) 100% sensitivity and negative predictive value and highest Youden index, while iPTH 15 and iPTH 10 considered optimum by others [1,2 and 10] were less optimal.

Patients with iPTH below the cut-off threshold (19.95 pg/mL) were considered high risk for postoperative hypocalcemia, while patients above the threshold were considered low risk.

Patients in phase I who developed hypocalcemia (serum calcium > 8.1mg /L) (1) or symptoms (1) were given promptly selective supplementation that include oral calcium carbonate 1500 mg (Caltrate - Pfizer- providing 600mg elemental calcium) and Alfacalcidol (a potent vit D3 analog) 0.5 mcg twice daily (One alpha Leo by Leo Pharmaceuticals).

Phase II included 178 patients with protocol implementation that included patient and family education about hypocalcemia, immediate iPTH assay (third generation) after TT, serial calcium level at 6 and 23 hrs., after surgery, and prompt oral calcium carbonate and Alfacidal supplementation as stated above to patient who had iPTH > 19.95 pg/mL, the calculated cut-off threshold.

Patients in both phases were evaluated on the morning of postoperative day one (at 24 hrs.) to ensure stable clinical condition and fulfillment of discharge criteria. All patients were discharged at 24 hrs. Any return to the ED, need for IV calcium, or readmission was recorded.

Low-risk patients in phase I (64%) and phase II (63%) were discharged with no supplementation. None of them developed symptoms, returned to the ED, or required any intervention later.

In high-risk patient’s symptomatic hypocalcemia occurred in 30% in phase I cohort who received selective supplementation versus 3% in phase II cohort who received prompt prophylactic supplementation (P-value 0.0003). Return to the ED and need for IV calcium were also significantly better in phase II (P=0.01).

*Correspondence to: Abdalla Y Bashir, Professor, Department of Surgery, Jordan Hospital, Amman, Queen Noor Street, 520248, Jordan; E-mail: aymbash@gmail.com


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This strategy of immediate iPTH assay after TT and prompt supplementation to high-risk patients allowed safe management with 24 hrs., discharge and can replace other strategies requiring more investigations and hospitalization. This satisfies the medico-economic concerns of patients and health care providers.

**Conflict of interest**

Authors do not have any financial interest to disclose.

**References**


