DOI: https://doi.org/10.47275/2332-4864-112
Volume 6 Issue 1
Short Communication

Scholit Publishers

Journal of Clinical & Anatomic Pathology

Early and Safe Management of Hypocalcemia after Thyroidectomy

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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 $\geq$ 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 $\geq$ 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).

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Citation: Bashir AY (2021) Early and Safe Management of Hypocalcemia after Total Thyroidectomy. J Clin Anat Pathol, 6(1): 112. DOI: https://doi.org/10.47275/2332-4864-112

Received: April 07, 2021; **Accepted:** April 21, 2021; **Published:** April 28, 2021

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

1. Stack BC Jr., Bimston DN, Bodenner DL, Brett EM, Dralle H, et al. (2015) American association of clinical endocrinologists and american college of endocrinology disease state clinical review: postoperative hypoparathyroidism--definitions and management. Endocr Pract 21: 674-685. https://doi.org/10.4158/ep14462.dsc
2. Orloff LA, Wiseman SM, Bernet VJ, Fahey III TJ, Shaha AR, et al. (2018) American thyroid association statement on postoperative hypoparathyroidism: diagnosis, prevention, and management in adults. Thyroid 28: 830-841. https://doi.org/10.1089/thy.2017.0309
3. Yunes Filho EB, Machry RV, Mesquita R, Scheffel RS, Maia AL (2018) The timing of parathyroid hormone measurement defines the cut-off values to accurately predict postoperative hypocalcemia: a prospective study. Endocrine 61: 224-231. https://doi.org/10.1007/s12020-018-1601-9
4. Galy-Bernadoy C, Lallemant B, Chambon G, Pham HT, Reynaud C, et al. (2018) Parathyroid hormone assays following total thyroidectomy: is there a predictive value? Eur Thyroid J 7: 34-38. https://doi.org/10.1159/000484689
5. Roh JL, Park CI (2006) Routine oral calcium and vitamin D supplements for prevention of hypocalcemia after total thyroidectomy. Am J Surg 192: 675-678. https://doi.org/10.1016/j.amjsurg.2006.03.010
6. Wang TS, Roman SA, Sosa JA (2012) Postoperative calcium supplementation in patients undergoing thyroidectomy. Curr Opin Oncol 24: 22-28. https://doi.org/10.1097/CCO.0b013e32834c4980
7. Landry CS, Grubbs EG, Hernandez M, Hu MI, Hansen MO, et al. (2012) Predictable criteria for selective, rather than routine, calcium supplementation following thyroidectomy. Arch Surg 147: 338-344. https://doi.org/10.1001/archsurg.2011.1406
8. Noordzij JP, Lee SL, Bernet VJ, Payne RJ, Cohen SM, et al. (2007) Early prediction of hypocalcemia after thyroidectomy using parathyroid hormone: an analysis of pooled individual patient data from nine observational studies. J Am Coll Surg 205: 748-754. https://doi.org/10.1016/j.jamcollsurg.2007.06.298
9. Bashir AY, Al-Zubidie AN, Bashir MA, Obed AH, Zakarneh RK, et al. (2021) The optimal parathyroid hormone cut-off threshold for early and safe management of hypocalcemia after total thyroidectomy. Endocr Pract. http://doi.org/10.1016/j.eprac.2021.02.014.
10. Carr AA, Yen TW, Fareau GG, Cayo AK, Misustin SM, et al. (2014) A single parathyroid hormone level obtained 4 hours after total thyroidectomy predicts the need for postoperative calcium supplementation. J Am Coll Surg 219: 757-764. https://doi.org/10.1016/j.jamcollsurg.2014.06.003