



# Is there enough evidence to recommend preoperative calcium and vitamin D in patients who undergo total thyroidectomy?

**Hyoung Shin Lee**

*Department of Otolaryngology-Head and Neck Surgery, Kosin University College of Medicine, Busan, Korea*

See “Effectiveness of prophylactic calcium and vitamin D supplementation for preventing post-thyroidectomy hypocalcemia: a meta-analysis” by Hyecheon Moon, Ju Won Seok, Keunyoung Kim, Hye Young Kim, Mi Kyoung Park, In Joo Kim, Kyoungjune Pak, Sunghwan Suh.

Hypoparathyroidism or hypocalcemia after total thyroidectomy occurs in up to 46% of patients temporarily and in 6.6% permanently [1,2]. It may be caused by inadvertent removal or devascularization of the parathyroid gland during surgery [3]. Therefore, surgeons should identify the parathyroid gland and preserve its vasculature to preserve the function. Even for experienced surgeons, post-thyroidectomy hypoparathyroidism is unavoidable in some cases, and the incidence may be higher for less experienced surgeons [4]. Management of post-thyroidectomy hypoparathyroidism includes supplementation of calcium and vitamin D, perorally or intravenously [5].

There have been several studies demonstrating the advantages of prophylactic calcium and vitamin D supplementation before surgery to prevent post-thyroidectomy hypocalcemia [6-9]. In a retrospective study of 65 patients who underwent total thyroidectomy, Maxwell et al. [7] presented that preoperative calcium and calcitriol supplementation for 5 days, in addition to routine postoperative supplementation, was associated with reduced incidence

of symptomatic hypocalcemia, length of hospital stays, and overall charges. In the study, patients were divided into two groups; one with preoperative as well as postoperative supplementation with calcium carbonate, 1,000 to 1,500 mg, three times daily and calcitriol, 0.25 to 0.5 µg, twice daily; and the other receiving only postoperative supplementation. The authors reported that the prophylactic medication led to savings of 2,819 US dollars per patient due to lesser amount of postoperative intravenous calcium gluconate and shorter hospital stay (0.9 days). While there are limitations in its retrospective design and relatively small number of enrolled patients, this may be a representative study demonstrating the advantage of prophylactic calcium and vitamin D supplementation before total thyroidectomy. While Rowe et al. [9] reported that high dose pre-thyroidectomy vitamin D (cholecalciferol) did not reduce the overall rate of postoperative hypocalcemia, we are curious whether both calcium and vitamin D have a role in prevention of post-thyroidectomy hypocalcemia.

In this issue of *Kosin Medical Journal*, Moon et al. [10]

**Received:** August 9, 2022; **Revised:** August 15, 2022; **Accepted:** August 15, 2022

**Corresponding Author:** Hyoung Shin Lee, MD, PhD

Department of Otolaryngology-Head and Neck Surgery, Kosin University College of Medicine, 262 Gamcheon-ro, Seo-gu, Busan 49267, Korea  
Tel: +82-51-990-6470 Fax: +82-51-990-3257 E-mail: [sego78@hanmail.net](mailto:sego78@hanmail.net)

© 2022 Kosin University College of Medicine

© This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

support using preoperative prophylactic calcium and vitamin D supplementation with routine postoperative supplementation for patients who undergo total thyroidectomy. They concluded that such supplementation led to lower incidence of symptomatic hypocalcemia. It seems reasonable to agree that the policy may be cost-effective and relatively safe in most cases. However, I believe that we need more evidence to recommend this policy for every patient who undergoes total thyroidectomy. As the authors have insisted in their article, a small number (four) of studies enrolled for this meta-analysis and the heterogeneous characteristics between the studies seem to be critical bias. In fact, incidence of post-thyroidectomy hypocalcemia may be related to the body mass index of the patient, pathology or size of thyroid tumor, presence of diffuse parenchymal disease, and extent of surgery whether neck dissection is included or not [8,11]. Duration, amount or dosage of medication, criteria for postoperative hypocalcemia, protocols for management such as intravenous calcium infusion have not been described in the review within the article. Outcomes may have great differences related to the protocols of management of hypocalcemia other than prophylactic calcium and vitamin D supplementation itself.

While prophylactic calcium and vitamin D supplementation may be considered as effective management to reduce post-thyroidectomy symptomatic hypocalcemia, recommendations to apply this policy in everyday cases of total thyroidectomy should be given with careful informed consent and monitoring. Dosage and duration of medication before surgery, as well as contraindications or risk factors for prescription should be decided with further well-designed studies. In addition, comparative studies showing a higher preventive effect of prophylactic calcium and vitamin D for post-thyroidectomy hypocalcemia over prophylactic vitamin D only may be required. Moreover, studies to evaluate whether the outcomes differ by level of preoperative serum calcium or vitamin D may be helpful for clinical decisions. Based on such studies, we may be able to suggest evidence-based guidelines for pre-thyroidectomy prophylactic supplementation of calcium and vitamin D.

## Article information

### Conflicts of interest

Hyoungh Shin Lee is an editorial board member of the jour-

nal but was not involved in the peer reviewer selection, evaluation, or decision process of this article. No other potential conflicts of interest relevant to this article were reported.

### Funding

None.

### Author contributions

All the work was done by HSL.

### ORCID

Hyoungh Shin Lee, <https://orcid.org/0000-0002-6200-1979>

## References

1. Bilezikian JP, Khan A, Potts JT Jr, Brandi ML, Clarke BL, Shoback D, et al. Hypoparathyroidism in the adult: epidemiology, diagnosis, pathophysiology, target-organ involvement, treatment, and challenges for future research. *J Bone Miner Res* 2011;26:2317-37.
2. Shoback D. Clinical practice. Hypoparathyroidism. *N Engl J Med* 2008;359:391-403.
3. Kim SW, Lee HS, Ahn YC, Park CW, Jeon SW, Kim CH, et al. Near-infrared autofluorescence image-guided parathyroid gland mapping in thyroidectomy. *J Am Coll Surg* 2018;226:165-72.
4. Kim SW, Song SH, Lee HS, Noh WJ, Oak C, Ahn YC, et al. Intraoperative real-time localization of normal parathyroid glands with autofluorescence imaging. *J Clin Endocrinol Metab* 2016;101:4646-52.
5. Kim DH, Kim SW, Kang P, Choi J, Lee HS, Park SY, et al. Near-infrared autofluorescence imaging may reduce temporary hypoparathyroidism in patients undergoing total thyroidectomy and central neck dissection. *Thyroid* 2021;31:1400-8.
6. Yu YR, Fallon SC, Carpenter JL, Athanassaki I, Brandt ML, Wesson DE, et al. Perioperative determinants of transient hypocalcemia after pediatric total thyroidectomy. *J Pediatr Surg* 2017;52:684-8.
7. Maxwell AK, Shonka DC Jr, Robinson DJ, Levine PA. Association of preoperative calcium and calcitriol therapy with postoperative hypocalcemia after total thyroidectomy. *JAMA Otolaryngol Head Neck Surg* 2017;143:679-84.
8. Jaan S, Sehgal A, Wani RA, Wani MA, Wani KA, Laway BA. Usefulness of pre- and post-operative calcium and Vitamin D supplementation in prevention of hypocalcemia after total thy-

- roidectomy: a randomized controlled trial. *Indian J Endocrinol Metab* 2017;21:51–5.
9. Rowe CW, Arthurs S, O'Neill CJ, Hawthorne J, Carroll R, Wynne K, et al. High-dose preoperative cholecalciferol to prevent post-thyroidectomy hypocalcaemia: a randomized, double-blinded placebo-controlled trial. *Clin Endocrinol (Oxf)* 2019;90:343–50.
  10. Moon H, Seok JW, Kim K, Kim HY, Park MK, Kim IJ, et al. Effectiveness of prophylactic calcium and vitamin D supplementation for preventing post-thyroidectomy hypocalcemia: a meta-analysis. *Kosin Med J* 2022;37:213–9.
  11. Huang T, Zhong X, He T, Zhang W, He Z. Establishing a predictive model of hypoparathyroidism after total thyroidectomy and central lymph node dissection for postoperative calcium supplementation selectively. *Ann Transl Med* 2022;10:678.