

Analysis of the incidence and factors predictive of inadvertent parathyroidectomy during thyroid surgery

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Dear Editors,

We recently came across the article titled ‘Analysis of the incidence and factors predictive of inadvertent parathyroidectomy during thyroid surgery’, by Hone *et al.*,¹ in your esteemed journal. Firstly, we would like to commend the authors on a well thought out and well written article. While the article addresses many important issues regarding the relatively common problem of inadvertent parathyroidectomy, we would like to add a few points which we feel could further enrich the content of the paper.

Preservation of all parathyroid glands decreases transient hypoparathyroidism compared with when three or fewer glands are preserved, but does not affect permanent hypoparathyroidism. A study by Song *et al.* showed that during total thyroidectomy, preserving at least one parathyroid gland with an intact blood supply appeared to be sufficient to prevent permanent hypoparathyroidism when autotransplantation was not performed.² Yet, even if the single preserved parathyroid appears to be viable, it may become non-functioning, leading to post-operative hypoparathyroidism. Paek *et al.* found that lack of experience was a statistically significant risk factor for permanent hypoparathyroidism on multivariate analysis,³ and this point should be kept in mind during post-graduate training.

Various studies have shown that estimation of post-operative parathyroid hormone (PTH) levels on the day following a total thyroidectomy is an effective strategy to detect hypoparathyroidism, and that a low PTH level on day 1 is associated with a high risk of permanent hypoparathyroidism.⁴ However, intra-operative PTH levels are not monitored routinely in thyroid surgery, although they are used widely during parathyroidectomy as an indicator of parathyroid gland function. Quiros *et al.* studied the use of intra-operative PTH levels as a predictive factor for post-operative hypoparathyroidism and found that an intra-operative PTH level of less than 10 pg/ml at closure was a strong predictor.⁵ The authors suggested that these patients should be placed on vitamin D supplementation after surgery to avoid anticipated symptomatic hypocalcaemia.

Lastly, we would like to add a few words on the use of pre-operative serum vitamin D levels as a predictive factor for post-operative hypocalcaemia. A study by Tripathi *et al.*, published in 2014, found that pre-operative serum vitamin D levels have a positive correlation with serum calcium levels in the early post-operative period.⁶ The study also showed that patients with serum vitamin D levels of less than 20 ng/ml were likely to develop early post-operative hypocalcaemia. Hence, it might be worthwhile for surgeons to consider the use of pre-operative serum vitamin D levels and intra-operative PTH levels as predictive factors for post-operative hypoparathyroidism in patients undergoing thyroid surgery.

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Authors' reply

Dear Editors,

The authors would like to thank Prof K Padmanabhan and Dr D Pulimoottil for their interest and comments in relation to our article¹ and the *Journal of Laryngology & Otology* for the chance to respond. Our study aimed to address factors that may be associated with parathyroid removal, rather than directly investigating the effect of incidental parathyroidectomy on post-operative hypocalcaemia.

The authors appreciate that preservation of the parathyroid glands is likely to influence calcium levels; however, the cause of post-operative hypocalcaemia is multifactorial. Furthermore, the theory that parathyroid injury or devascularisation leads to hypocalcaemia cannot be reliably assessed based on review of histological specimens. The study by Song *et al.* showed a statistically significant increase in transient hypocalcaemia following incidental parathyroidectomy on multivariate analysis,² and is supported by other literature.^{3,4} However, other studies have not found an association between inadvertent parathyroidectomy and hypocalcaemia.^{5–8} A systematic review and meta-analysis may help to develop understanding of the relationship between incidental parathyroidectomy and hypocalcaemia.

All surgeons in our study were in the first half of their careers and routinely supervised training surgeons. Surgical experience is a well-recognised factor affecting surgical outcomes and this should be considered when assessing any post-operative complication.

Intra-operative and early post-operative serum parathyroid hormone (PTH) levels are an established but expensive (although potentially cost-effective) method of attempting to predict post-operative hypocalcaemia following total or completion thyroidectomy. Low levels may encourage early calcium supplementation to prevent hypocalcaemia.^{9–13} In the UK, rapid PTH measurement is not routinely available in many centres, and therefore is not recommended by the