Peer Review File

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Reviewer A

Authors described the impact of all parathyroid gland detection in total thyroidectomy to prevent hypocalcemia. This topic is very important issue to endocrine surgeon and I think that authors conducted this study well. Some questions belows will be answered to build up their result.

1. Authors used the awkward unit for the PTH and Calcium level, pmol/L. General clinicians use the normal range of parathyroid hormone level as 14 to 65 pg/ml, and calcium level for 8.5 to 10.5 mg/dl, in scientific literature. It may be helpful to change the measurement unit to standard manner.
Reply: Thank you for your good comments! We have changed the measurement unit from pmol/L and mmol/L to pg/ml and mg/dl in main text, tables and figures, according to 1 pmol/L PTH = 9 pg/ml PTH and 1 mmol/L serum calcium = 4 mg/dl serum calcium.

2. During the January 2013 and June 2018, all of your surgical records have the right description about the numbers of saved parathyroid glands? There maybe missing or insincere description in some parts of the surgical documents. I think that is is the one of the reason for 6 times lower incidence of 3 parathyroid glands idenfication due to the doubt situation will be recorded as "all 4 glands were saved". And how's the incidece of 2 or only 1 parathyroid glands were identified?
Reply: Thank you for your constructive comments. As mentioned in our manuscript according to a previous study, it was reported that 78% of people had 4 of these glands, and about 15% had 3. However, the incidence of 4 parathyroid glands identification was 85.1% and the incidence of 3 parathyroid glands identification was 14.9% in our present study. On one hand, we believed that the difference of parathyroid glands identification incidence between our present study and the previous study was not great. On the other hand, we agreed that there may be missing or insincere description in some parts of the surgical documents, which resulted in lower incidence of 3 parathyroid

glands identification due to the doubt situation would be recorded as "all 4 glands were saved". We have described in the limitation about this. As for the second question “how's the incidence of 2 or only 1 parathyroid gland was identified”, no case of 2 or only 1 parathyroid gland was identified in our study because all the patients included in present were identified with 3 or 4 parathyroid glands.

3. In the similar context, how can authors insist that patients in 3 parathyroid groups are really have only 3 parathyroids. Possibility of unidentified or ectopic parathyroids are still present. It may be described in the limitation.
Reply: Thank you for your constructive comments. We have described it in the limitation.

4. Suppose that if there's a lobectomy patient with all 2 ipsilateral parathyroids were sacrificed. In this patient, we cannot meet the hypoparathyroidism, although this patient has only 2 parathyroids. Generally in thyroid surgery area, more important thing to prevent postoperative hypoparathyroidism is not the remained numbers of parathyroids but the vascularity to the parathyroids. Can the authors describe their surgical technique to save the vascularity of parathyroids?
Reply: we have described our surgical technique to save the vascularity of parathyroid in Line 106-112, Page 5-6.

Reviewer B

The authors investigated the impact of 1) identification of all PGs and 2) PG autotransplantation. Although this topic is interesting to me, I have some concerns.
1) Definition of hypoparathyroidism using on PTH level seems inappropriate. As shown in table 2, 3, and 4, PTH level can increase or decrease in the same patients group over time. Please refer the definition of hypoparathyroidism from the American Thyroid Association (DOI: 10.1089/thy.2017.0309).
Reply: Thank you for your helpful comments. We have modified the definition of hypoparathyroidism in present study referring to the American Thyroid Association (DOI: 10.1089/thy.2017.0309). Transient hypoparathyroidism was defined as occurring

for less than six months after surgery, while permanent hypoparathyroidism continued beyond six months after surgery. We defined postoperative hypoparathyroidism as a PTH level < 14 pg/ml, regardless of hypocalcemia symptoms. This consisted of biochemical and clinical hypoparathyroidism defined by American Thyroid Association.

2) In table 4, PG autotransplantation may decrease the risk of permanent hypoparathyroidism, although there was no statistical significance. It would be helpful to analyse the effect of PG autotransplantation in patients with 4 identified PGs.

Reply: Thank you for your constructive comments. Some studies have reported that PG autotransplantation may decrease the risk of permanent hypoparathyroidism. Therefore, we believed that it would be helpful to analyze the effect of PG autotransplantation in patients with 4 identified PGs. We have tried it according to your advice. However, no statistical significance was found, which might because of the small number of permanent hypoparathyroidism. The results were showed below. On another hand, the title of this study was “Surgical strategy when identifying less than four parathyroid glands during total thyroidectomy: A retrospective cohort study” and the aims of this study were to investigate the rule of parathyroid function in patients with three parathyroid glands and to provide evidence for the surgical strategy of patients with fewer parathyroid glands. Therefore, we thought the effect of PG autotransplantation in patients with 4 identified PGs was not the key point of this article and this was why we didn’t show the results about it.

Table Comparisons in patients with 4 identified parathyroid glands

	In situ preservation (N = 184)	Autotransplantation (N = 1028)	P
Permanent hypoparathyroidism	3(1.63%)	15(1.50%)	1.000

3) Multivariate logistic regression analysis including number of identified PGs, PG and autotransplantation can support your conclusion, as you have large cohort,

Reply: Thank you for your valuable comments! We have made univariate analysis and multivariate logistic regression analysis including number of identified PGs, autotransplantation, accidental resection, Hashimoto's disease, sex, capsule invasion, etc. The results were shown in the revised manuscript.

4) English proofreading is needed. There were some grammatical and typographical errors.

Reply: We have proofread and polished English with the help of a native speaker. Thank you!