

Can we do away with intraoperative parathyroid hormone for primary hyperparathyroidism patients with concordant pre-operative imaging?

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Introduction

- Parathyroidectomy** is the definitive treatment for patients with primary hyperparathyroidism (PHPT)
- The use of intraoperative parathyroid hormone (IoPTH) assay has led to high clinical success rates but also resulted in longer operative duration, and high false negative rates.
- This is a retrospective study of operative cases of PHPT performed in our institution.
- Aim: To audit the turnover time and evaluate the feasibility of omitting routine IoPTH in selected cases.

Results

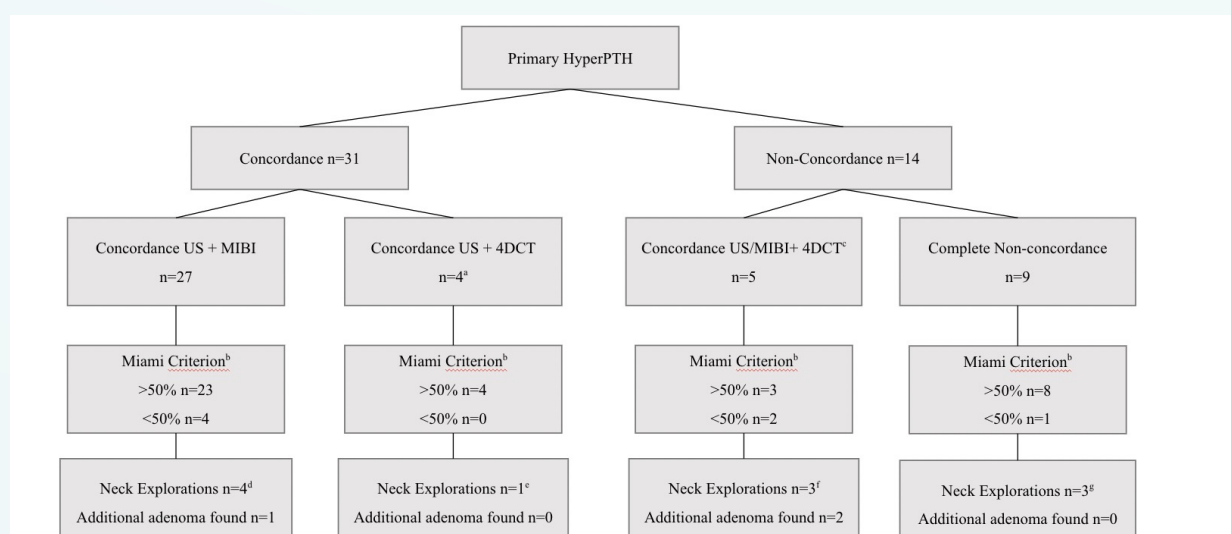
- 45 patients were included in this study
- 31 (68.9%) patients had **concordant** pre-operative imaging. 87.1% had adequate IoPTH reduction and only one case (2.22%) of dual parathyroid adenoma.
- 14 (31.1%) patients had **non-concordant** imaging, of which 36 (78.6%) had adequate IoPTH reduction in this group. There were 2 cases (14.3%) of dual parathyroid adenoma.
- For patients with concordant pre-op imaging, there were high rates of **false PTH failure**, where patients who not fulfill Miami's criterion AND did not find additional adenoma on neck exploration was 75%.
- Average additional wait time for IoPTH turnover: 36 minutes.

Materials and Methods

- All patients underwent parathyroidectomy for PHPT in Ng Teng Fong General Hospital (NTFGH) from August 2015 to February 2023.
- All patients had routine IoPTH assessment based on the the Miami criteria, and patients were stratified into groups based on the **concordance of pre-operative imaging**.

Table 3: Preoperative Imaging concordance status and respective False PTH failure results

Preoperative Imaging	IoPTH decline not fulfilling Miami's Criterion	Additional Adenoma found ^a	False PTH failure
Concordance n=31	4 (12.9%)	1 (3.2%)	3 (75%)
Non-concordance (concordance US/MIBI + 4DCT) n=5	2 (40%)	2 (40%)	0 (0%)



^aMIBI was not done for 4 patients as 2 patients had acute presentations, 1 patient was an emergency case, and 1 patient did not turn up for MIBI scan

^bMiami Criterion states that a >50% drop in intraoperative PTH level from the highest pre-incision or pre-excision hormone level at 10 minutes after excision indicates complete excision of all hyperfunctioning parathyroid gland(s)

^cThis group of patients have non-concordance between MIBI and US scans but have shown concordance between US and 4DCT or between MIBI and 4DCT

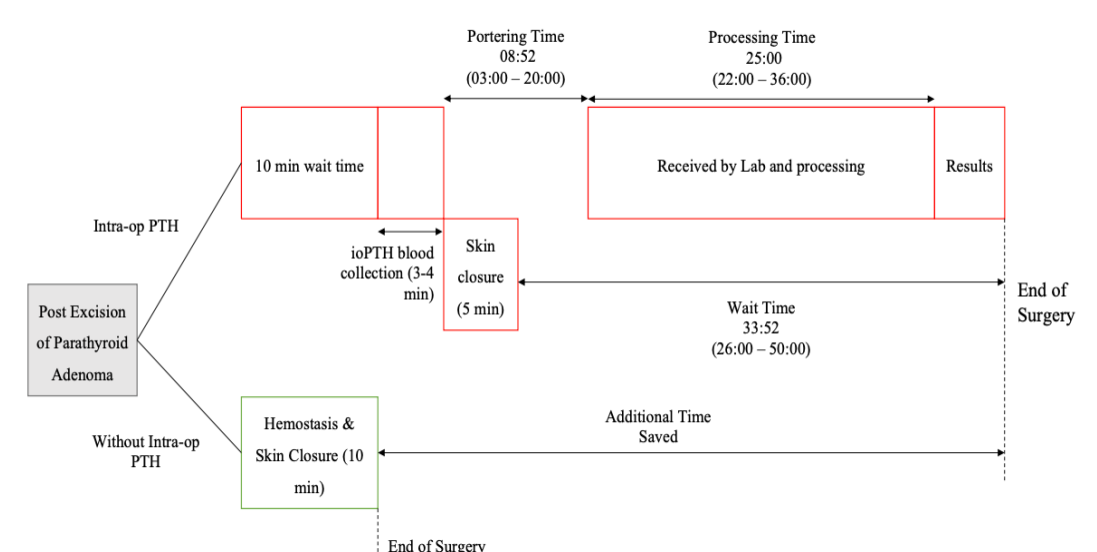
^d1 neck exploration was done for patient who fulfilled Miami Criterion as parathyroid was intra-thyroid. 1 neck exploration was not done for patient who failed Miami Criterion as IoPTH was within normal range and Vit D was deficient

^eNeck exploration was done for 1 patient due to concerns of MEN syndrome

^fNeck exploration was done for 1 patient as parathyroid was posterior to carotid sheath

^gNeck explorations planned for 2 patients due to possibility of multi-gland disease based on pre-op scans

Fig 2: Flowchart of processes and timings with and without intra-operative PTH measurements



Discussion/Conclusion

- IoPTH adds little value in patients with concordant imaging, with a rate of unsuspected Multi-Glandular Disease of 3.2%.
- However, the use of IoPTH remains useful when there is non-concordance in localization.
- Recommendation: For well-selected patients with concordant imaging, IoPTH may not be required, improving both operative time and overall cost effectiveness.