The Management of Hypocalcaemia Following Total/Completion Thyroidectomy: A Completed Audit Cycle

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Background

Hypocalcaemia following total/completion thyroidectomy is a well-recognised complication due to damage to or inadvertent removal of the parathyroid glands.

There are potentially **fatal consequences** if hypocalcaemia is inadequately treated.

- Symptoms & signs of hypocalcaemia include:
- Tingling/pins & needles peri-oral & in the extremities
 - Skin petechiae
 - Latent tetany (positive Trousseau & Chvostek's sign)
 - Frank tetany of the limbs
 - Hyperactive tendon reflexes
 - Prolonged QT interval on the ECG
 - Cardiac arrhythmias
 - Laryngospasm

The British Association of Endocrine and Thyroid Surgeons¹ guidelines suggest post-operative calcium and PTH tests to help identify and predict hypocalcaemia so as to aid in the prevent of post-operative complications.

Results

The introduction of new local guidelines has helped to improve consistency in the management of post-operative hypocalcaemia.

Quality of documentation has improved. The re-audit demonstrated **100% of patients** got their PTH and calcium checked, compared to only **36%** previously for PTH. The guidelines were followed accurately in **100%** of patients in the re-audit compared to **40%** in the primary audit cycle.

First & second audit cycle results

	First Audit Cycle	Second Audit Cycle
Number of patients	11	8
% Total thyroidectomy	54.5%	87.5%
% Completion thyroidectomy	45.5%	12.5%
% patients with hypocalcemia	45.5%	25.0%
% requiring IV Calcium	18.0%	25.0%
PTH & Bone profile checked post-op	9.0%	100.0%
Guidelines followed for treatment?	40.0%	100.0%

Objectives

- To identify whether our management of post-operative hypocalcaemia in total/completion thyroidectomy patients is in keeping with the national guidelines.
- To improve the management of post-operative hypocalcaemia with the aim of enhancing patient safety and outcomes after surgery

Methods

An initial audit was performed evaluating post-operative hypocalcaemia management. Demographic information and data on post-operative complications, biochemical tests and management was collected.

Data was collected across a 3 month period on all patients undergoing **total or completion thyroidectomy**. Patients undergoing additional complex head and neck procedures e.g. neck dissection were excluded.

After the first audit demonstrated inconsistencies in management of post-operative hypocalcaemia, a **proforma** was created for patients' notes, in addition to new **local guidelines** accessible via the intranet. A treatment algorithm was created and implemented.

A re-audit was performed after a couple of months to evaluate whether the changes were successful and whether patient care was improved.

Post Total/Completion Thyroidectomy Hypocalcaemia Management Protocol

Lancashire Teaching Hospitals NHS Foundation Trust

Patient Name: _____

DOB: _____

Hospital No: _____

Procedure: Total / Completion Thyroidectomy

Surgeon: JDC / AC / AN

Procedure Date: _____

Discharge Date: _____

Date/Time	Adj. Ca ²⁺	PTH	Action Taken
Day of Op			
4-6h after			
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			

Daily 6am Bloods

Normal Ranges

Adj. Calcium [2.2 – 2.6 mmol/L]

PTH [1.5 – 7.6 pmol/L]

Calcium <1.8 or 1.8-2.0 & symptomatic

Follow the acute management hypocalcaemia guidelines

- 12-lead ECG
- Urgent Calcium check
- Large bore IV cannula

If severe symptoms/calcium <1.8:

- 10ml 10% IV Calcium Gluconate in 100ml 0.9% Saline over 1 hour
- Then 40ml 10% IV Calcium Gluconate in 100ml 0.9% Saline over 24 hours
- Commence Adcal D3
- Repeat Calcium in 24 hours
- Consider Endocrine referral if refractory

Calcium 1.8 – 2.0 & asymptomatic

- Commence Adcal D3
- Repeat Calcium check within 12 hours
- If asymptomatic after 72 hours but still 1.7 – 2.0 increase supplements & add Alfacalcidol 0.25mcg/day
- When Calcium >2.0 discharge with Calcium check in 7 days

Calcium >2.0

Recheck Calcium at 72 hours and if normal discharge

PTH

If PTH <0.5 then prescribe Alfacalcidol 0.5 micrograms BD

S&S of Hypocalcaemia

- Peri-oral/extremity tingling
- Paraesthesia
- Arrhythmias / prolonged QTc
- Laryngospasm
- Hyperactive reflexes
- Tetany – Chvostek's & Trousseau's sign

November 2017

Conclusion

This re-audit has demonstrated improvements in the management of post-operative hypocalcaemia following thyroid surgery.

It has highlighted the benefits of trainees being actively engaged with the creation of local guidelines.

It has improved patient safety and outcomes following thyroid surgery within the department.

References

1 – BAETS guidelines <http://www.baets.org.uk/guidelines/>

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