



Treatment resistant hypocalcaemia linked to nasogastric administration of calcitriol.

Sarah A. Hitchen

Department of Pharmacy, Fiona Stanley Hospital

Email: Sarah.Hitchen@health.wa.gov.au

Case details

We present a 58-year-old female hospitalised for total laryngectomy for recurrent T4a Hurthle cell thyroid carcinoma.

PMHx: multiple prior thyroid resections, depression and dyslipidaemia.

Pre-surgery ionised calcium was 1.27mmol/L (reference range 1.12-1.32mmol/L).

No parathyroid tissue was visualised during operation.

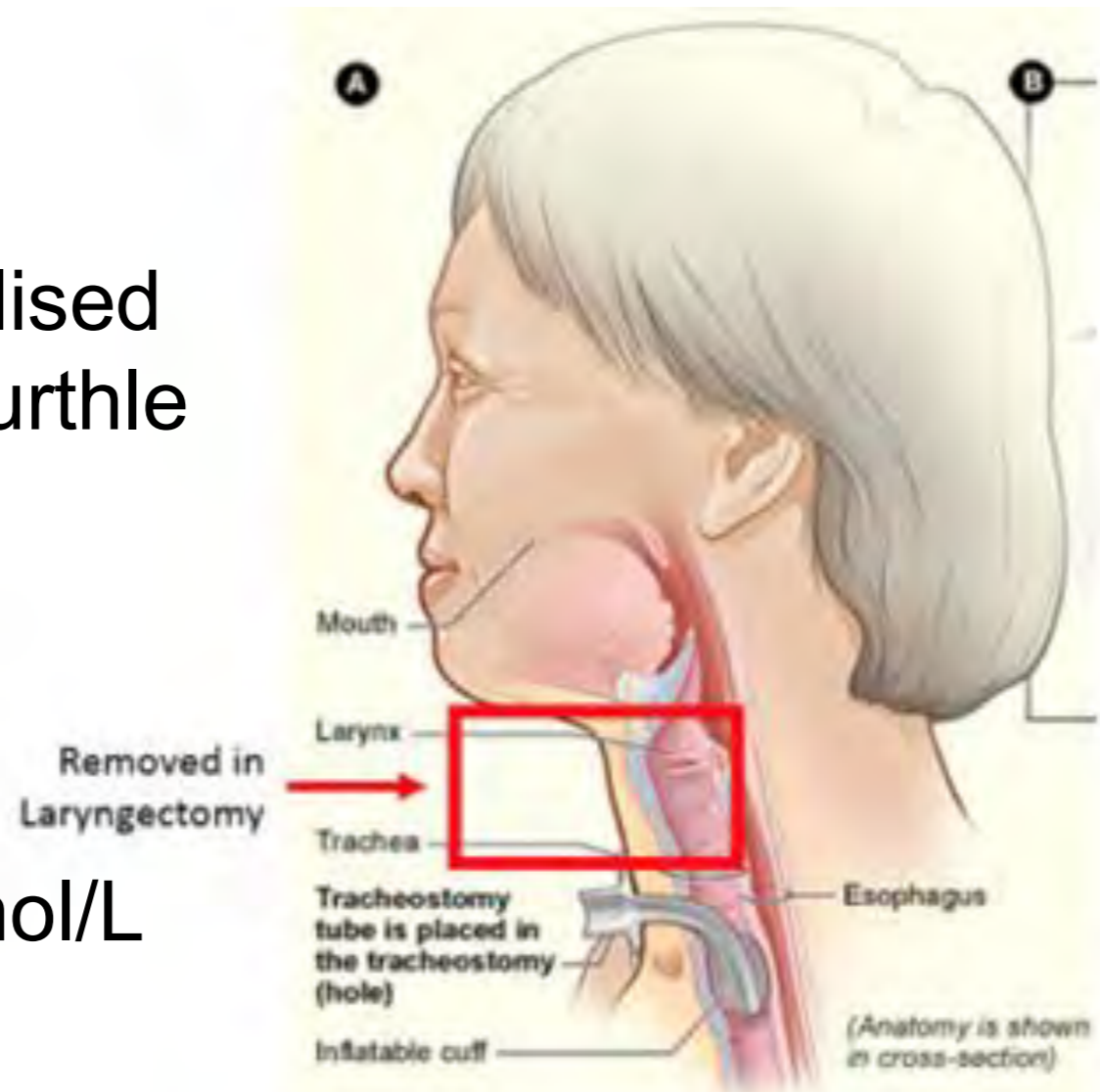
Post-operatively, routine calcium replacement was commenced, and a nasogastric tube placed for nutrition and medications.

The patient experienced **persistent symptomatic hypocalcaemia** (ionised calcium 1mmol/L) despite efforts to:

- ☑ Space calcium from bolus feeds,
- ☑ Escalate calcium (6g/day) and calcitriol (2mcg/d) to maximum doses,
- ☑ Changing oral calcium to liquid formulation and,
- ☑ Administer IV calcium gluconate.



The endocrinology pharmacist was consulted for advice.



Literature review

Calcitriol is a crystalline compound, soluble in organic solvents and insoluble in water.



It is formulated as 0.25microgram of calcitriol dissolved in 0.17mL of medium chain triglycerides in a hard gelatin-glycerol capsule which cannot be opened.

The *method of extracting calcitriol (below) is complex* and requires suitably trained personnel. Medication loss can occur due to:

- ☑ Inadequate operator technique,
- ☑ Viscous/oily liquid inside capsule (difficult to draw into syringe),
- ☑ Poor water solubility (recommended to mix with water) and,
- ☑ Adsorption to the nasogastric tube.

Table 2: Don't Rush to Crush Handbook

CALCITRIOL
What to do for people with enteral feeding tubes
You will need: an enteral syringe, 2 small syringes, one with a needle attached.
1. Draw 5mL of water into the enteral syringe.
2. Remove the plunger from one of the small syringes, place the calcitriol capsule inside the barrel of the syringe and re-insert the plunger so that it is pressed against the capsule.
3. Use the syringe with the needle attached to carefully pierce the capsule through the tip of the syringe that contains the capsule and withdraw the liquid.
4. Add the calcitriol liquid to the water in the enteral syringe.
5. Shake the enteral syringe well and give into the feeding tube. Flush the tube well.

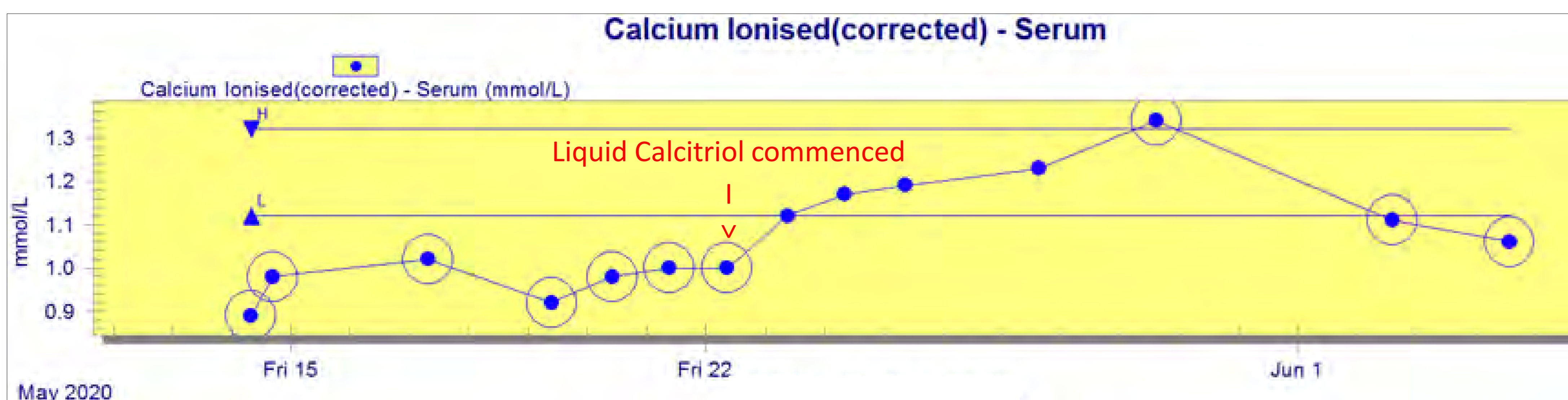


Pharmacist Interventions, Case Progress and Outcomes

The pharmacist reviewed medication suitability for nasogastric administration, interactions, biochemistry results and timing of doses to optimise absorption. Furthermore, different calcium formulations were trialed including elemental salts and liquid.

Failing this, the **manipulation of calcitriol capsules for nasogastric administration was suspected to be the cause of treatment failure.**

Locally compounded calcitriol 1microgram/mL liquid was sourced which immediately resolved the hypocalcaemia. Due to oedematous large pseudoepiglottis the patient was unable to swallow and discharged on liquid calcitriol coordinated by the pharmacist and speech therapist.



Discussion

1. Pharmacists offer a unique perspective to approaching treatment failure.
2. Consider medication manipulation for nasogastric administration as a confounding factor to treatment failure.