



## Acute Hypocalcaemia with Hypoparathyroidism after Pharyngeal Cauterization for Bleeding Several Days after a Tonsillectomy

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### Abstract

A 28-year-old female started bleeding several days after an uncomplicated tonsillectomy. After cauterization, she developed symptomatic acute hypocalcaemia with hypoparathyroidism. This resolved with calcium and vitamin D supplementation and she did not require any long-term vitamin D or calcium. This case is interesting because while hypoparathyroidism is a common complication of parathyroidectomy or other neck surgery, it is not typically associated with tonsillectomy. Moreover, rat's post-parathyroidectomy has been demonstrated to have survival benefit after implantation of differentiated human mesenchymal stem cells obtained from the tonsils [1-3], so this report may support a common origin of tonsil and parathyroid mesenchyme.

### Background

Tonsillectomy and adenoidectomy are among the most commonly performed surgeries, with 400,000 tonsillectomies being performed annually in the European Union [4]. While the procedure is more common in the Pediatric age group, it is also quite common in the adult population for problems such as recurrent acute pharyngitis and chronic tonsillitis, suspicion of malignant disease, and refractory halitosis. There are many well-known adverse outcomes of tonsillectomy. However, hypocalcaemia and hypoparathyroidism are not well described.

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### Case Presentation

A 28-year-old female presented to emergency department with a chief complaint of bleeding coming from her pharynx eight days after having an uncomplicated tonsillectomy. Her hemoglobin level was 84 g/L, likely indicating significant blood loss (there was no preoperative hemoglobin for comparison, as the patient was healthy and did not receive a preoperative or postoperative blood count). The patient was not coughing or vomiting any blood, was not bleeding anywhere else, and did not have any fever. The patient was taken to operating room, where a pumping vessel was visualized between the right-sided oropharyngeal muscles and subsequently cauterized with suction. Several sutures of 3-0 vicryl and 3-0 chromic were placed in a figure-of-eight. Besides minor blood lost during the procedure, 200 mL of swallowed blood was aspirated from the stomach *via* nasogastric suction.

Two hours postoperatively, the patient complained of new-onset tingling in her fingers. She did not have any other symptoms of hypocalcaemia such as perioral tingling or numbness. Her serum calcium level returned at 6.9 mg/dL (reference 8.5 to 10.5 mg/dL). The patient received one gram of calcium gluconate intravenously which resolved her symptoms. Twelve hours post-operatively, more complete labs were drawn which showed a serum calcium level of 8.3 mg/dL, phosphate 2.6 mg/dL (reference 2.5 to 4.5), magnesium 1.5 mEq/L (reference 1.3 to 2.1), total 25-hydroxy vitamin D 12.2 ng/mL (reference 25.0 to 80.0), parathyroid hormone level 9.5 pg/mL (reference 14 to 55.7 pg/mL), thyroid stimulating hormone 0.25 IU/mL (normal 0.35 to 4.01), free T3 2.6 pg/mL (reference 2.8 to 4.4), and free T4- 0.83 ng/mL (reference 0.61 to 1.37). The patient had not been transfused any blood at any time (as her hemoglobin was always above 85 g/L), nor did she receive any intravenous fluids other than Ringer's lactate, which at our hospital, contains 200 mg (2.7 mEq) of calcium chloride per liter and would be expected to forestall any hypocalcaemia.

### Outcome and Follow-Up

The patient was discharged two days afterwards and did well without any further symptoms. At

the time of discharge, total serum calcium level was 8.11 mg/dL. One month after discharge, her serum ionized calcium level was checked in lieu of the total calcium, and it returned 1.13 mMol/L (normal 1.1 to 1.3). TSH was normal 1.17  $\mu$ IU/mL, and hemoglobin level was marginally low at 11.9 g/dL.

## Discussion

Include a very brief review of similar published cases:

Although about 1.5% of adults are reported to have bleeding after tonsillectomy and 20% of adults have some other complication such as pain, postoperative nausea and vomiting, delay to oral intake, or airway obstruction [5], to the best of our knowledge, hypocalcaemia following tonsillectomy is not typical. It is quite common for physiological stress to cause thyroid hormone abnormalities, but this hasn't been as recognized with parathyroid hormone levels. We suspect that the bleeding and cauterization in the proximity of the parathyroid glands may have interfered with parathyroid function and resulted in hypocalcaemia.

Studies showed that rats post-parathyroidectomy have demonstrated survival benefit after implantation of differentiated human tonsil-derived mesenchymal stem cells [1-3]. So, putting these two things together, tonsil and parathyroid mesenchyme may have related origins.

## Learning Points

- Hypocalcaemia occurs oftentimes after neck surgery and can have many etiologies, such as blood transfusions (blood

anticoagulants such as citrate may chelate calcium), volume repletion with intravenous fluids which do not contain calcium (such as sodium chloride), and sepsis.

- The most common cause of chronic hypoparathyroidism is an injury to the parathyroid glands, such as head and neck surgery.
- This case is unusual because tonsillectomies are not typically associated with acute hypocalcaemia or hypoparathyroidism.

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