

# Parathyroid incidentalomas: case report and literature review

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## Abstract

We report the case of a 60-year-old woman with a multinodular goitre who underwent total thyroidectomy and was found intraoperatively to have a parathyroid 'incidentaloma'. The surgical approach to the management of patients with incidental parathyroid disease is discussed and a review of the literature is presented.

## Keywords

Parathyroid incidentaloma; thyroidectomy; normocalcaemia.

## Case report

A 60-year-old woman presented to the outpatient clinic with a swelling in the neck, pressure symptoms and biochemically euthyroid (t4 12.8 pmol/l and TSH 0.22 munits/l).

She underwent an ultrasound of the thyroid gland which confirmed the presence of a multinodular goitre. No other separate nodules were seen on ultrasound. The right lobe of the thyroid measured 24 × 19 × 49 mm and the left lobe was 28 × 29 × 59 mm. A dominant nodule measuring 25 mm in maximum diameter was demonstrated in the lower pole of the left lobe. The dominant nodule was aspirated and the material obtained was sent for cytology, which revealed peripheral blood cells and colloid only, and no malignant cells.

The patient was scheduled for a total thyroidectomy because of her pressure symptoms and the pre-operative adjusted calcium, albumin, and creatinine were all within normal range. Parathyroid hormone was not measured as there was no indication. During the procedure, one parathyroid gland appeared enlarged and after careful consideration it was excised. The remaining parathyroids were all normal in size.

The histology results confirmed a multinodular goitre and a parathyroid adenoma. The parathyroid measured 17 × 7 × 5 mm and weighed a bit less than 1 g. Sections of parathyroid gland showed a well-circumscribed nodular lesion composed of chief cells and oxyntic cells, with minimal fat. At one edge of the nodular lesion was the remainder of the compressed gland parenchyma with entrapped adipose tissue.

Post-operatively, she developed transient moderate hypocalcaemia (adjusted calcium 1.80 mmol/l), which was treated with oral calcium supplements and calcitriol. She was seen in

the outpatient clinic a few weeks later and she was normocalcaemic, and no longer required calcium supplements.

## Diagnosis

Multinodular goitre with co-existing asymptomatic parathyroid adenoma ('incidentaloma').

## Clinical evidence and unusual features

Primary hyperparathyroidism is a relatively common disease which has an incidence between 1 in 1000 and 1 in 200<sup>[1]</sup>. Patients are diagnosed with clinical hyperparathyroidism because they are found to have high calcium levels or, less frequently, because they are symptomatic. However, a small group of patients who do not exhibit any biochemical or clinical manifestations of the disease are thought to have 'subclinical' hyperparathyroidism because of the appearance of the parathyroid glands. These patients are only discovered by chance during surgery involving exploration of the neck usually for thyroid disease or, less frequently, during pre-operative sonography of the thyroid<sup>[1-3]</sup>. Further evidence for the presence of 'subclinical' hyperparathyroidism is provided by autopsy studies which have reported enlarged parathyroid glands in patients without clinical or biochemical abnormalities<sup>[4]</sup>.

Although incidental tumours of other endocrine glands, in particular adrenals, thyroid and pituitary are well documented, parathyroid incidentalomas are less common. The first case was reported in 1937 and since then there have been less than 50 cases reported worldwide<sup>[2]</sup>. The incidence of parathyroid incidentalomas (hyperplasia or adenoma) during thyroid surgery varies between 0.2% and 4.5%<sup>[1,2,5]</sup>. In our experience the incidence is close to 1% since this was the only incidentaloma discovered after 140 thyroid operations. Parathyroid incidentalomas appear to be more common in women with a ratio between 3:1 and 5:1<sup>[1,5]</sup>.

Radiation appears to play a role in the development of parathyroid disease. Tisell *et al.*<sup>[6]</sup> reported that 11 out of 100 patients treated with radiation for tuberculous cervical adenitis developed hyperparathyroidism and four had asymptomatic hypercalcaemia<sup>[6]</sup>. In the same study only four patients had thyroid cancer illustrating that parathyroid disease was three times more prevalent than thyroid disease after exposure to radiation. Katz and Kong<sup>[1]</sup> reported that out of the 36 patients who had parathyroid incidentalomas, 13 had a previous history of radiation. Consequently, parathyroid pathology should be suspected in patients who are scheduled to undergo thyroidectomy and have a history of exposure to radiation.

Patients undergoing thyroid surgery should have their calcium levels checked pre-operatively. In a study published by Denizot *et al.*<sup>[7]</sup>, 748 patients scheduled for thyroid surgery were screened for primary hyperparathyroidism by measurement of their calcium levels pre-operatively. Patients with serum calcium <2.5 mmol/l were not investigated further. Patients with serum calcium  $\geq 2.5$  mmol/l had their serum calcium repeated and the parathyroid hormone level measured. Patients with two serum calcium levels  $\geq 2.5$  mmol/l and a serum parathyroid hormone  $\geq 50$  pg/ml were positively screened. All other patients were defined as negatively screened. Nine patients were positively screened and were all found to have a parathyroid adenoma during surgery. Patients in the positive screening group had their parathyroids carefully inspected before excision of any thyroid tissue. The adenoma was found to be easily accessible in six patients but required specific dissection in three of them. In the negatively screened group of 739 patients, the surgeon looked for the parathyroid glands near the thyroid but not any further if they were not seen. In this group, 12 patients (1.6%) had one or more visibly enlarged parathyroid gland and 2 (0.3%) were found to have hyperparathyroidism after surgery. This study demonstrates that screening for primary hyperparathyroidism before thyroid surgery benefits a small number of patients, especially those who are positively screened, and in whom the parathyroid pathology is unlikely to be detected intraoperatively.

Several studies have supported the excision of an enlarged parathyroid gland found incidentally during the course of a thyroid operation even though one cannot predict that it will lead to clinical hyperparathyroidism. Interestingly, the article published by Carnaille *et al.*<sup>[5]</sup> implies that the parathyroid incidentalomas may represent the early stage of a hyperfunctioning parathyroid gland. In their study, Carnaille *et al.*<sup>[5]</sup> reported that the parathyroid glands removed for primary hyperparathyroidism were heavier, more active and occurred in older patients when compared to parathyroid incidentalomas discovered during thyroid surgery.

The rationale behind excising incidentalomas is mainly based on three parameters. First, the risk of recurrent hyperparathyroidism after removal of a parathyroid incidentaloma is extremely low<sup>[1,2,5]</sup>. Second, the risk of permanent post-operative hypocalcaemia is again very low and it can be easily treated with calcium supplements. Third, and more importantly, even though one cannot predict what percentage of parathyroid incidentalomas will lead to clinical hyperparathyroidism, a subsequent neck dissection would be difficult and carries an increased risk of complications.

### Teaching point

The incidence of parathyroid incidentalomas may be as high as 4.5%. All patients undergoing thyroid surgery should have pre-operative calcium levels measured. If calcium levels are high/borderline high or if there is a history of radiation exposure, parathyroid hormone levels should be measured. Pre-operative normocalcaemia does not preclude parathyroid disease so inspection of the parathyroids during thyroid surgery is recommended, especially since it does not prolong the operation significantly and may assist in avoiding subsequent neck exploration which has well-documented morbidity. If a parathyroid incidentaloma is found, it should be removed since simultaneous thyroidectomy and parathyroidectomy can be performed safely in the hands of an experienced surgeon.

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