Online Case Report

Minimally invasive parathyroid surgery for recurrent intrathyroid multiple endocrine neoplasia (MEN)

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A case of recurrent multiple endocrine neoplasia-related hyperparathyroidism treated by minimally invasive parathyroid surgery is discussed.

Key words: Minimally invasive surgical procedures – Multiple endocrine neoplasia

A 52-year-old lady with hypercalcaemia (Ca 2.77 mmol/l) was seen in the endocrine surgery clinic in May 2002 to discuss parathyroid surgery for recurrent primary hyperparathyroidism. Her previous history was as follows.

She was first diagnosed with hypercalcaemia (Ca 2.79 mmol/l) secondary to primary hyperparathyroidism in October 1976 after presenting to her GP with left renal colic and depression. In February 1977, she underwent bilateral neck exploration with removal of two enlarged parathyroid glands (left inferior and left superior). Histology of the excised glands confirmed an adenoma in one and hyperplasia in the other. Postoperatively, she made a good recovery and the depression improved.

In 1980, she was noted to have persistent mild hypercalcaemia with serum calcium just above the upper limit of normal (2.61 mmol/l) and histological review of the previously excised glands confirmed chief cell hyperplasia in both. She remained symptom-free until 1989 when her depression recurred and the calcium was found to have risen further (Ca 2.7 mmol/l). She was treated with ECT for her depression, with only partial improvement, and continued to have regular calcium monitoring. By the end of 1993, the depression worsened

and calcium levels rose to 2.87 mmol/l. She was seen by the same endocrine surgeon who undertook a second

Figure 1 Early (15 min) and delayed (2 h) images taken after intravenous administration of 600 MBq ^{99m}Tc-Sestamibi show delayed tracer washout at the lower pole of the right lobe of thyroid. These findings accurately localised a parathyroid adenoma.

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neck exploration at which time only one gland (right superior) was found and removed. Although her symptoms improved, her calcium levels remained high and further monitoring showed the calcium to be steadily rising.

In April 2001, a diagnosis of multiple endocrine neoplasia I (MEN I) was confirmed by polymerase chain reaction (PCR) and direct sequencing demonstrating heterozygosity for a missense mutation of codon 241 in exon 4 of the MEN I gene. Investigations at this time revealed a raised parathyroid hormone (PTH, 108 pmol/l) and calcium (2.71 mmol/l). A parathyroid scintigram (^{99m}technetium-Sestamibi) was requested and this showed increased uptake of tracer at the lower pole of the right lobe consistent with a parathyroid adenoma (Fig. 1).

In June 2002, she underwent day-case parathyroidectomy, under general anaesthesia, using a minimal invasive technique. The operation lasted 40 min and the parathyroid gland was identified within the thyroid tissue. Postoperatively, she was started on oral vitamin D and calcium for 2 weeks prior to review in the out-patient clinic. The patient was asymptomatic with normal PTH (6 pmol/l) and calcium (2.47 mmol/l). Histology confirmed parathyroid hyperplasia.

Discussion

The classical surgical approach to the management of MEN-related hyperparathyroidism describes total or subtotal parathyroidectomy and cervical thymectomy.¹ This would normally be performed via a collar incision with bilateral neck exploration.² In patients who have had previous bilateral neck surgery, the tissue planes are less well defined, making identification of the parathyroid glands more difficult, and increasing the risk of recurrent laryngeal nerve injury.³ Since patients with MEN-related hyperparathyroidism are prone to develop recurrent disease, the potential benefits of repeat bilateral neck exploration must be balanced against the increased risk of complications.

In this particular case, a 2-cm incision was made lateral to the medial border of the right sternomastoid, 1.5 cm above the lateral end of the previous collar incision. The lateral approach⁴ develops the plane between sternomastoid and the strap muscles, giving an excellent view of the retro-thyroid space, and allowed scar tissue from previous surgery

to be avoided. After routine right neck exploration failed to reveal any parathyroid tissue, the parathyroid gland was identified within the right thyroid lobe at the site of delayed tracer washout on ^{99m}Tc-Sestamibi scanning (Fig. 1). This scan has a sensitivity and specificity of 90% and 98%, respectively⁵ and facilitates unilateral neck exploration for primary hyperparathyroidism.

The postoperative PTH fell from 108 pmol/l to 6 pmol/l and, as the PTH is still detectable, the authors fully accept that there is a risk of further recurrence in the future. This approach is in no way intended to replace conventional bilateral neck exploration for initial surgery or indeed for a first recurrence. It has, however, provided a simple approach to an extremely difficult problem for this particular patient.

Conclusions

The use of pre-operative localisation has allowed focused, unilateral surgery to treat a difficult case of recurrent MEN-related hyperparathyroidism successfully. Despite the intrathyroid position of the parathyroid gland, it was detectable using this approach. This minimally invasive approach is extremely suitable for day-case surgery, provides a favourable cosmetic outcome, and may provide an alternative approach to patients with recurrent hyperparathyroidism that have already had bilateral neck surgery and where conventional neck exploration may prove difficult.

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