A 57-year-old woman with a history of childhood radiation therapy to her neck for tonsillear enlargement underwent right upper parathyroid gland excision in 2003 for primary hyperparathyroidism. The left upper and lower parathyroid glands were found to be eutopic and of normal size. The right lower parathyroid gland was not identified. Postoperatively, the patient had persistent primary hyperparathyroidism and was referred for remedial parathyroid exploration. Preoperative imaging with a technetium Tc 99m sestamibi scan suggested uptake in the right lower thyroid region. This was corroborated by magnetic resonance imaging (MRI) and thyroid ultrasound, which showed a fully intrathyroidal hypervascular hypoechoic mass in the right inferior thyroid pole (Fig. 1A and 1B, arrow pointing to posterior margin). An ultrasound-guided fine-needle aspiration of the lesion revealed an intact parathyroid hormone (PTH) level of 2330 pg/mL, confirming the presence of parathyroid tissue within the thyroid lobe. Based on this finding, the patient underwent minimally invasive parathyroid surgery (1). Under cervical block anesthesia the inferior aspect of the right thyroid lobe was resected. A rapid intraoperative PTH assay indicated a 50% decrease in plasma PTH levels after resection (2). Pathologic examination of the gross specimen demonstrated a fully intrathyroidal parathyroid adenoma measuring 1.2 cm (Fig. 2, normal size 5–7 mm). Histologic examination of the mass demonstrated a hematoxylin-eosin stained parathyroid adenoma embedded within the right thyroid gland (Fig. 3). The patient was discharged home on the day of the surgery. Follow-up serum calcium and PTH levels were within normal limits at 9.8 mg/dL and 9 pg/mL, respectively.

Most individuals have four parathyroid glands located in eutopic positions along the posterior surface of the thyroid gland. However, as a result of embryologic variance, parathyroid glands can localize anywhere between the angle of the jaw and the pericardium. Occasionally, a gland will become encased within the thyroid. Of the intrathyroidal parathyroid glands that have been reported, the vast majority span the thyroid capsule and are only partially intrathyroidal (3). Very rarely, the gland will become fully encased within the thyroid parenchyma. The detection of intrathyroidal parathyroid adenomas frequently involves several imaging techniques, including radionuclide imaging, high-resolution ultrasonography, computed tomography, MRI, arteriography, and venous sampling. The novel use of the rapid PTH assay for an ultrasound-guided tissue fine-needle aspiration is described to localize an intrathyroidal parathyroid adenoma in preparation for reexploration subsequently performed using minimally invasive techniques.

References


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