

Transoral Excision of a High Retropharyngeal Parathyroid

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ABSTRACT

In patients with renal failure, hypocalcemia leads to multiglandular parathyroid growth and parathyroid hypersecretion. Parathyroidectomy has been shown to decrease cardiovascular events and mortality in these patients. One of the challenges of surgery for secondary hyperparathyroidism is the high reported incidence of supernumerary and ectopic glands. This in conjunction with reported low sensitivity of preoperative imaging studies in multigland disease and unclear criteria for intraoperative PTH in 2HPT may lead to incomplete parathyroidectomy and need for reoperation. We report a case of recurrent 2HPT from an ectopic supernumerary gland in the high retropharyngeal region found by CT imaging. Due to the patient's obesity, short neck and history of prior neck surgery, we elected to excise the gland transorally using intraoperative EUS.

Keywords: Parathyroid adenoma, Transoral, EUS.

INTRODUCTION

In patients with renal failure, hyperphosphatemia and decreased alpha-1 hydroxylase activation of vitamin D can lead to hypocalcemia. The hypocalcemia in turn stimulates multiglandular parathyroid growth and hypersecretion characteristic of secondary hyperparathyroidism (2HPT). Correction of the underlying disease stimulus with renal transplantation is the only definitive treatment for 2HPT. Prior to transplantation, patients are managed medically with dialysis, phosphate binders, active vitamin D and calcimimetics. The goal being to maintain normal calcium and phosphorus levels and parathyroid hormone (PTH) levels that are three times normal value.¹ Indications for surgery in patients with 2HPT include medically refractory disease (PTH > 500 pg/ml, calcium > 10.0 mg/dl or phosphate > 6.0 mg/dl), symptomatic disease (bone pain, pruritus) and systemic disease manifestations (renal osteodystrophy, ectopic calcification, erythropoietin-resistant anemia, dilated cardiomyopathy).² Some authors advocate ultrasonography to estimate parathyroid gland size and thereby the likelihood that PTH hypersecretion will no longer respond to medical management.² The overall mortality rate is increased 25% in patients with 2HPT and PTH levels greater than 495 pg/ml,³ thus, the need to control the disease state surgically if necessary. Parathyroidectomy in patients with 2HPT has been associated with a reduction in cardiovascular events and overall mortality.⁴ Since patients with primary hyperparathyroidism (PHPT) most often have single gland disease, preoperative localization studies and intraoperative PTH monitoring (IOPTH) are frequently used in an effort to perform a directed

parathyroidectomy. In contrast, the multiglandular involvement characteristic of 2HPT precludes minimally invasive parathyroidectomy. In addition, the low sensitivity of imaging studies in the detection of multigland disease is well documented.^{5,13} Though important in the reoperative setting, the role of preoperative imaging for localization is unclear in patients with 2HPT undergoing initial surgery.⁵ Likewise, the IOPTH criteria predictive of curative surgery in 2HPT are not well-established.⁶ Surgical options for 2HPT include subtotal or 3.5 gland parathyroidectomy and total parathyroidectomy with forearm autotransplantation. Regardless of procedure choice, thorough exploration is essential due to the high reported incidence of supernumerary and ectopic glands.^{3,7,8} Despite careful surgery, recurrence rates of 25 to 30% following initial surgery for 2HPT have been reported.⁹

CASE REPORT

Our patient is a 61-year-old female with end-stage renal disease due to hypertension who had been on hemodialysis for the last 15 years. The patient was managed medically at an outpatient dialysis center and subsequently referred for surgery at an outside institution due to medically refractory disease. Initial operation included total parathyroidectomy with forearm autotransplantation. Approximately 1 year later, a significant rise in her PTH level prompted reevaluation at the same outside institution and subsequent excision of her transplanted parathyroid tissue. After an initial decrease, the PTH level again rose less than 1 year later. Sestamibi scintigraphy showed remaining functional parathyroid tissue at the site of autotransplanted tissue as well as abnormal uptake in the midline

at the region of the base of tongue. Computed tomography of the neck showed a nodular density in the upper neck posterior to the pharynx and anterior to the spine at the base of tongue (Fig. 1). The estimated distance from the mucosa and left carotid artery was 4 mm and 1.5 cm respectively. At this time, the patient was referred to The University of Texas Southwestern Medical Center for recurrent 2HPT due to a presumed ectopic, supernumerary parathyroid. The patient had no aerodigestive compressive symptoms, and flexible laryngoscopy did not show any bulge in the posterior pharyngeal wall. Due to the anatomic location of the gland, the patient's prior neck surgery, and most notably her body habitus with a short broad neck and BMI of 49.10, we elected to proceed with transoral excision aided by intraoperative endoscopic ultrasound localization.

In June of 2008, the patient was taken to the operating room and general endotracheal anesthesia established with

some difficulty due to poor visualization of the larynx. Transoral endoscopic ultrasound was performed and a rounded 1.14×0.82 cm mass was localized posterior to the pharyngeal wall and adjacent to the left common carotid artery. The distance between the mass and the pharyngeal lumen was approximately 4 mm. Under endoscopic sonographic guidance, a 22-gauge needle was used to inject 1.5 cc of methylene blue into the mucosa to facilitate subsequent transoral excision (Fig. 2). The patient was then placed in microsuspension laryngoscopy and 1% xylocaine with epinephrine was injected into the posterior pharyngeal wall. The pharyngeal musculature was sharply incised and using careful blunt dissection, the abnormal parathyroid was identified in the posterior pharyngeal fat slightly to the left of midline. The gland was circumferentially dissected and excised (Fig. 3). The carotid arteries were not encountered during the procedure.

The gland measured $1.6 \times 1.0 \times 1.0$ cm and weighed 1200 mg. Intraoperative frozen sections were used to confirm the mass was composed of parathyroid tissue. Floseal was placed within the wound, the posterior pharyngeal wall was closed with 2-0 Vicryl, and a nasogastric tube was placed. We elected to perform a temporary tracheostomy in light of the operative site, large tongue base, narrow pharynx, obese body habitus, history of obstructive sleep apnea and difficult intubation. Intraoperatively, her PTH level dropped from 434.4 to 122.2 pg/ml and 71.8 pg/ml at 5 and 10 minutes following gland excision respectively. Postoperatively, she was monitored in the ICU for 1 day. Her PTH level on postoperative day 1 was < 2.5 , and she was managed with calcium and calcitriol supplements via the nasogastric tube. On POD10 after placement of a fenestrated tracheostomy, she passed a capping trial. In addition, she was able to pass a swallow study and her nasogastric tube was subsequently removed. On POD11, she was decannulated uneventfully and



Fig. 1: Contrast CT scan showing retropharyngeal parathyroid adenoma (arrow)

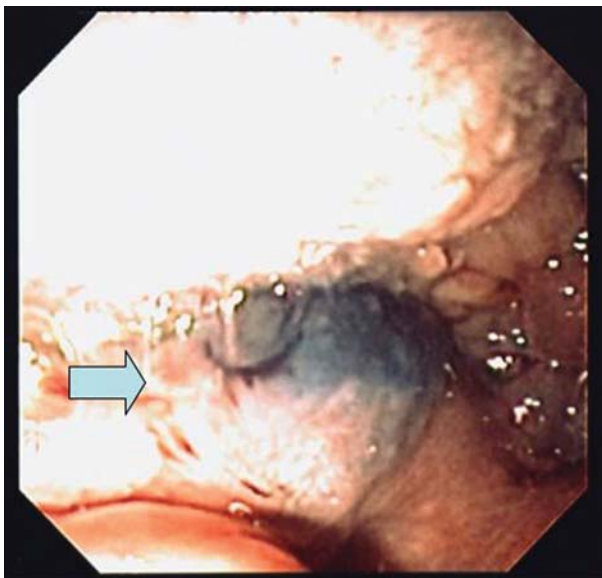


Fig. 2: Intraoperative view of pharynx after EUS injection of methylene blue



Fig. 3: Intraoperative view of parathyroid adenoma after dissection

discharged home. In outpatient follow-up, patient remained decannulated without issue and has no dysphagia or odynophagia.

DISCUSSION

We would like to focus on the higher degree of difficulty that reoperative cases pose and the need for various modalities to help with these difficult cases. This is the second reported case of a high retropharyngeal parathyroid adenoma in the literature; the previous was removed through a cervical incision.¹⁰ We present a novel approach to ectopic parathyroids in the neck. While modalities such as CT, MRI and Tc99m scans are essential for localization in redo parathyroid explorations, they may become increasingly important by helping to avoid missing supernumerary and ectopic glands in initial parathyroidectomy as techniques become more directed. 99mTc-sestamibi scans are reported to detect 83% of abnormal glands in 2HPT.¹¹ Presently, intraoperative Tc99m scans are being trialed for real-time localization in ectopic parathyroidectomies.¹² Imaging, such as SPECT/CT can be used to precisely localize abnormal glands, the anatomic detail can be particularly helpful in reoperative cases where neck anatomy may be distorted.¹³ Initial operative failures include limitations in preoperative localization, incomplete exploration and the natural history of the hyperplastic parathyroid tissue.³ Reoperation in these cases is technically challenging and nontraditional modalities, as in this case, may be required. With the advent of more precise imaging and the use of IOPTH, the incidence of recurrent/persistent 2HPT may decrease as well as the degree of difficulty in reoperative cases. Our case highlights:

1. An unusual location of an ectopic parathyroid adenoma.
2. A novel approach to surgical resection of an ectopic parathyroid adenoma.
3. The increasing reliance on imaging modalities for successful preoperative localization and adequate resection of parathyroid disease.

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