

Association of Women Surgeons

Ambulatory bilateral neck exploration for primary hyperparathyroidism: is it safe?



Colleen M. Kiernan, M.D., M.P.H.^{a,*}, Cameron Schlegel, M.D.^a,
Chelsea Isom, M.D.^a, Sandra Kavalukas, M.D.^a,
Mary F. Peters, C.R.N.A.^b, Carmen C. Solórzano, M.D., F.A.C.S.^c

^aDepartments of Surgery and ^bAnesthesiology and ^cDivision of Surgical Oncology and Endocrine Surgery, Vanderbilt University, Nashville, TN, USA

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Abstract

BACKGROUND: We sought to determine if bilateral neck exploration (BNE) for hyperparathyroidism could be performed safely in an ambulatory setting (same-day discharge) when compared with focused parathyroidectomy.

METHODS: A retrospective review of 503 patients who underwent parathyroidectomy from 2010 to 2015 was performed. Focused parathyroidectomy was compared with BNE. Only patients with positive localization and no prior operations were included.

RESULTS: Forty-nine percent of patients underwent focused parathyroidectomy and 51% had BNE. BNE patients were more likely to have 1 or more glands removed (35% vs 14%, $P < .01$) and longer operative times (median 50 vs 41 minutes, $P < .01$). There were no differences in the rate of same-day discharge, transient hypocalcemia, emergency department visits, and readmissions.

CONCLUSIONS: In this study, BNE for hyperparathyroidism was associated with excision of more parathyroid glands and slightly longer operative times. However, BNE had equal rates of same-day discharges and safety profile.

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Bilateral neck exploration (BNE) is considered the gold standard operation for primary hyperparathyroidism (HPT).¹ However, with improvement in preoperative imaging and utilization of intraoperative parathyroid

hormone monitoring (IPM), focused parathyroidectomy is now used at an increasing rate.²⁻⁴ Greene et al² reported a major switch in parathyroidectomy practice in the United States between 1998 and 2003, when the majority of surgeons adopted focused parathyroidectomy as the preferred surgical approach to HPT.

Multiple studies have shown equivalent short- to mid-term success rates of focused parathyroidectomy guided by intraoperative parathyroid hormone (ioPTH) when compared with BNE.⁵⁻¹³ If both operative approaches have equal success rates, then the major reported reasons surgeon's currently prefer the focused approach are its relative ease of completion, lesser dissection, potential for smaller incisions, shorter operative times, avoidance of overnight stay, and potential cost containment.¹³⁻¹⁵

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* Corresponding author. Tel.: +1-815-603-5228; fax: +1-615-322-0689.

E-mail address: colleen.m.kiernan@vanderbilt.edu

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Recent studies have shown that in an era when preoperative radiologic localization studies are pervasive regardless of focused versus BNE approach, a major driver of cost in parathyroidectomy is the use of BNE. The increased cost is solely attributed to the assumed overnight stay when BNE is utilized. These studies suggest that the use of multiple preoperative localization studies is more cost effective due to avoidance of the overnight hospital stay associated with BNE and to potentially shorter operating times.^{16–18} Few studies have compared BNE with focused parathyroidectomy in patients with a localized parathyroid,⁵ and to our knowledge, none have evaluated the safety of same-day discharge in this setting.

This study examines our experience utilizing both operative approaches in a consecutive fashion in patients with HPT and preoperatively localized parathyroid glands. We sought to determine if BNE could be performed safely in an ambulatory setting.

Methods

After Institutional Review Board approval, a retrospective review of the records of 503 patients undergoing parathyroidectomy by a single surgeon over a 5-year period was performed.

Patients with secondary, tertiary, lithium induced, or familial HPT were excluded ($n = 55$). Patients with a history of previous parathyroid surgery ($n = 35$) and those requiring a concurrent thyroid procedure were also excluded ($n = 59$). Parathyroidectomy was offered to symptomatic and asymptomatic patients who met 2008 or 2014 consensus criteria or to patients who desired the operation and could tolerate it. Only patients with at least one positive imaging study were included. Surgeon-performed ultrasound was carried out in all patients to evaluate the thyroid and localize the parathyroid. Sestamibi scans were obtained if the gland was not localized by ultrasound or had been already ordered by the referring physician. Computed tomography scans were rarely ordered. The imaging study was considered positive if the radiologist and/or surgeon documented the presence of an abnormal parathyroid gland after review of imaging.

During the first 2.5 years of the study period (June 2010 to December 2012) focused parathyroidectomy was preferentially performed. In this focused cohort, conversion to a BNE was performed when the abnormal gland was not localized intraoperatively where the localization study predicted or when the ioPTH failed to decrease by more than 50% from baseline 10 minutes after gland removal, or when the ipsilateral gland appeared abnormal. During the latter 3 years of the study period (January 2013 to March 2015), BNE with an effort to visualize all parathyroid glands was preferentially performed. In this BNE cohort, exploration began on the side of the localized gland and ioPTH was obtained after removal of the imaged gland. Exploration of the remaining ipsilateral and contralateral

glands was carried out and any additional abnormally enlarged gland(s) was removed (even when ioPTH decreased appropriately). Failure of ioPTH to decrease by more than 50% from baseline after removal of the imaged gland signaled additional exploration for re-evaluation of the already visualized glands or supernumerary glands. All patients underwent general or laryngeal mask airway anesthesia. On average, a 3-cm incision was utilized and occasionally the incision was extended depending on the patient body habitus. All patients were offered ambulatory surgery. Patients were discharged home when they met postoperative anesthesia care unit criteria and after the surgical site was evaluated by the resident or attending surgeon. Calcium carbonate 1,000 mg three times a day for 2 weeks is prescribed to all patients undergoing parathyroidectomy regardless of approach. Calcitriol .25 μg daily for 2 weeks is added when subtotal parathyroidectomy is performed. All patients are seen in surgical clinic 2 weeks after parathyroidectomy. Patients were grouped into 2 cohorts for comparison by intention to treat: the focused era and the BNE era.

Preoperative variables

Patient demographics including age and sex as well as American Society of Anesthesiologists (ASA) classification, preoperative laboratory values, and imaging findings were recorded. Preoperative laboratory values included calcium, PTH, and vitamin D 25-OH levels.

Perioperative variables

The ultimate surgical approach, number of parathyroid glands removed, recurrent laryngeal nerve injury, operative time, postoperative hematoma, and same-day discharge were documented. For the purpose of analysis, the number of glands removed was dichotomized into one or more than 1 gland removed. Recurrent laryngeal nerve injury was defined as vocal cord paralysis documented by postoperative laryngoscopy that was persistent for more than 6 months. At our institution, indirect laryngoscopy or transcutaneous vocal cord ultrasound¹⁹ is performed selectively when a patient experiences voice changes pre- and postoperatively. Operative time was defined as the time from skin incision to skin closure including ioPTH wait times. Reasons for overnight stay were variable and included postoperative nausea, concern for hypocalcemia, lack of transportation/patient request (5%), comorbid conditions, and concern for bleeding.

Outcome variables

Postoperative emergency department (ED) visits, hospital readmissions, transient and permanent hypocalcemia, normocalcemic postoperative PTH elevation, and operative success were documented. Transient hypocalcemia was

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