Supplementary Online Content

Graff-Baker AN, Bridges LT, Chen Q, Faries MB, Said M. Parathyroidectomy for patients with primary hyperparathyroidism and associations with hypertension. *JAMA Surg*. Published online October 9, 2019. doi:10.1001/jamasurg.2019.3950

eMethods. Propensity Score Matching Description

eTable 1. Number of Antihypertensive Medications Prescribed for Parathyroidectomy Patients

eTable 2. Patient Characteristics After Propensity Score Matching

eTable 3. Estimated Effects of Parathyroidectomy on Change in Antihypertensive Medication Use (Matched Cohort)

This supplementary material has been provided by the authors to give readers additional information about their work.

eMethods. Propensity Score Matching Description

The propensity score was defined as the probability that a patient would undergo surgery conditional on the observed covariates: age, gender, number of antihypertensive medications, mean arterial pressure, body mass index, parathyroid hormone level, calcium level, and Charlson comorbidity index. Propensity scores were generated using logistic regression modelling based on above covariates. Following propensity score generation, each subject who underwent parathyroidectomy was paired with a subject in the no surgery group based on the similarity of their propensity scores (+/-0.01) using greedy matching. The covariates in the matched sample were more balanced across the parathyroidectomy and no surgery groups and therefore allows a stronger statement of association between surgery and outcome. To test the balance of the two groups, the standardized difference was estimated. A standardized difference of 0.2 or greater in absolute value is considered imbalance, and above 0.1 is considered meaningful. All covariates were adjusted in subsequent conditional logistic regression to remove the residual bias due to small imbalances that persist after matching.

eTable 1. Number of Antihypertensive Medications Prescribed for Parathyroidectomy Patients

	At diagnosis	At surgery	Difference (95%CI)	*P* Value[a]
No. of antihypertensive medications, mean (SD)	1.22 (1.04)	1.24 (1.07)	0.026 (-0.04, 0.10)	0.47

[a] P-value is based on paired t-test.

eTable 2. Patient Characteristics After Propensity Score Matching

	No surgery (N=438)	Parathyroidectomy (N = 438[a])	Standardized difference
Age (years), mean (SD)	67.0 (9.98)	66.1 (9.45)	-0.10
<65, n (%)	185 (42.2)	184 (42)	
65-75, n (%)	177 (40.4)	170 (38.8)	0.05
≥75, n (%)	76 (17.4)	84 (19.2)	
Sex, n (%)			
Female	338 (77.2)	346 (79)	0.04
Male	100 (22.8)	92 (21)	
Race/Ethnicity, n (%)			
Asian, non-Hispanic	20 (4.6)	25 (5.7)	
Black, non-Hispanic	81 (18.5)	85 (19.4)	
Hispanic	102 (23.3)	97 (22.1)	0.08
White, non-Hispanic	2 (0.5)	4 (0.9)	
Other, non-Hispanic	233 (53.2)	227 (51.8)	
Length of follow-up (years), mean (SD)	1.9 (0.33)	1.9 (0.32)	0.02
BMI, mean (SD)	30.3 (6.81)	30.0 (6.54)	-0.04
Normal (<25), n (%)	101 (23.1)	95 (21.7)	
Overweight (25-30), n (%)	154 (35.2)	155 (35.4)	0.03
Obese (≥30), n (%)	183 (41.8)	188 (42.9)	
Median MAP, mean (SD)	94.6 (9.77)	93.8 (8.17)	-0.09
No. of antihypertensive medications, mean (SD)	1.3 (1.19)	1.3 (1.06)	0.02
PTH level[b], mean (SD)	125.8 (86.78)	133.5 (78.08)	0.09
Calcium level[b], mean (SD)	10.9 (0.50)	10.9 (0.63)	-0.03
Charlson comorbidity index, n ,(%)			
0	168 (38.4)	151 (34.5)	
1 to 2	162 (37)	170 (38.8)	0.08
3 or more	108 (24.7)	117 (26.7)	

Abbreviations: SD, standard deviation; BMI, body mass index (calculated 1 as weight in kilograms divided by height in meters squared); MAP, mean arterial pressure; PTH, parathyroid hormone.
[a] 63 patients in the parathyroidectomy group had no matched control
[b] Baseline PTH and calcium were derived as median PTH or calcium within 6 months prior to index date.

eTable 3. Estimated Effects of Parathyroidectomy on Change in Antihypertensive Medication Use (Matched Cohort)[a]

	6 months		1 year		2 years	
	AOR (95% CI)	*P* Value	AOR (95% CI)	*P* Value	AOR (95% CI)	*P* Value
Medication increase (n=876)						
No surgery	Ref		Ref		Ref	
Parathyroidectomy	0.49 (0.31, 0.80)	.004	0.44 (0.27, 0.70)	<.001	0.61 (0.39, 0.96)	.03
Medication decrease (n=638)						
No surgery	Ref		Ref		Ref	
Parathyroidectomy	1.18 (0.74, 1.86)	.50	1.61 (1.05, 2.46)	.03	1.13(0.78, 1.63)	.52

Abbreviations: AOR, adjusted odds ratio; Ref, reference.
[a]Adjusted for age, gender, medication, MAP, BMI, PTH, calcium, and Charlson comorbidity index