

Risk Factors for Prolonged Length of Hospitalization in Transsphenoidal Excision of Benign Pituitary

Tumors

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Introduction

There is conflicting literature on what factors affect outcomes for patients undergoing pituitary surgery. We wished to determine what peri-operative factors are associated with adverse outcomes in patients undergoing transsphenoidal procedures for excision of benign pituitary tumors.

Methods

We identified 501 adult patients who underwent transsphenoidal excision of benign pituitary tumors from 2006-2012 at hospitals participating in the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP), a prospectively-collected, national clinical database with established reproducibility and validity. Univariate logistic regression identified baseline factors associated with adverse 30-day outcomes; all factors identified were incorporated into the final multivariate models.

Results

Table 1: Univariate analyses of baseline characteristics of patients who underwent transsphenoidal procedures for excision of benign pituitary tumors and 30-day outcomes (N = 501)

Baseline characteristics	Prevalence	Outcomes		
		Prolonged length of stay (>4 days)	Any complications†	Discharged with continued care‡
Age, years, mean ± SD (per 10 years)	54 ± 16	1.1 (0.9-1.2)	1.8 (1.1-2.8)	1.0 (0.8-1.3)
Female	51.5%	1.3 (0.8-1.9)	0.9 (0.5-1.7)	0.9 (0.3-2.7)
Minority race	40.3%	1.7 (1.2-2.6)	0.9 (0.5-1.9)	0.3 (0.1-1.4)
Transfer status				
Admitted from home	96.4%	Reference	Reference	Reference
Transferred from outside facility	3.6%	17.0 (4.8-59.6)	2.6 (0.7-9.6)	10.2 (2.3-45.2)
Smoking status				
Never	74.3%	Reference	Reference	Reference
Current	14.3%	1.2 (0.7-2.2)	1.3 (0.6-3.2)	4.1 (1.3-13.7)
Previous	11.5%	0.6 (0.3-1.2)	0.4 (0.1-1.9)	1.5 (0.2-13.0)
>2 alcoholic drinks per day	1.3%	0.8 (0.1-7.5)	NA	NA
Dependent functional status	3.0%	2.7 (1.0-7.6)	2.0 (0.4-9.1)	121 (12-1-NA)
ASA classification				
1 + 2	44.7%	Reference	Reference	Reference
3 + 4	55.3%	2.4 (1.6-3.8)	2.1 (1.0-4.5)	2.5 (0.7-9.1)
BMI, kg/m ² , mean ± SD (per 5 kg/m ²)	31.3 ± 7.1	1.0 (0.9-1.2)	1.3 (1.1-1.6)	0.8 (0.5-1.3)
Type II insulin requiring medication	46.9%	1.0 (0.6-1.5)	1.0 (0.5-1.9)	1.3 (0.4-3.9)
Diabetes mellitus	15.0%	1.9 (1.1-3.2)	1.4 (0.6-3.2)	3.3 (1.0-10.6)
Cerebrovascular comorbidities*	2.3%	2.7 (0.72-10.4)	3.3 (0.7-16.5)	4.3 (0.4-43.1)
Cardiopulmonary comorbidities*	12.8%	1.8 (1.1-3.2)	1.1 (0.4-2.9)	1.5 (0.3-6.9)
Renal comorbidities*	23.0%	1.3 (0.81-2.1)	0.9 (0.4-2.1)	1.1 (0.3-4.2)
Cancer comorbidities†	2.4%	0.6 (0.1-2.8)	NA	NA
Bleeding risk factors*	6.6%	2.4 (1.2-4.9)	1.3 (0.4-4.4)	1.2 (0.1-9.7)
Steroid use for chronic condition	8.4%	1.2 (0.6-2.5)	1.0 (0.3-3.3)	1.9 (0.4-9.3)
Preoperative anemia	31.3%	1.8 (1.2-2.8)	1.4 (0.7-2.7)	0.7 (0.2-2.6)
Sepsis or SIRS	1.4%	4.1 (0.9-18.7)	10.1 (2.2-46.9)	14.6 (2.2-96.5)
Prior operation within 30 days	1.1%	10.1 (1.1-98.5)	3.7 (0.4-36.7)	NA
Abnormal WBC count	21.4%	1.4 (0.8-2.3)	2.2 (1.0-4.5)	0.9 (0.2-4.4)
Abnormal LFT*	11.4%	2.5 (1.4-4.4)	2.3 (1.0-5.4)	3.2 (0.9-10.8)
Abnormal sodium	20.6%	0.5 (0.3-0.9)	0.7 (0.3-1.8)	1.7 (0.5-5.8)
Length of surgery, mins, mean ± SD, (per 60 min)	146 ± 67	1.8 (1.5-2.3)	1.3 (1.0-1.6)	1.0 (0.6-1.5)
Perioperative transfusion	1.4%	18.9 (2.3-158.4)	5.2 (1.0-28.0)	NA
Emergency	2.8%	4.2 (1.4-12.4)	2.2 (0.5-10.0)	3.3 (0.4-29.7)
Resident in OR	66.9%	0.6 (0.4-1.0)	1.5 (0.7-3.5)	2.3 (0.3-20.6)
Multiple CPTs	39.9%	1.1 (0.7-1.7)	0.6 (0.3-1.3)	2.1 (0.6-6.9)

Table 2: 30-day post-operative outcomes in patients who underwent transsphenoidal procedures for excision of benign pituitary tumors and 30-day outcomes (N = 501)

Outcomes	Prevalence
Total length of hospital stay, days	
mean ± SD	4 ± 6
median	3
Prolonged length of stay (>4 days)	25.0%
Minor complications‡	3.4%
Superficial site infection	0.2%
Urinary tract infection	2.0%
Deep venous thrombosis or thrombophlebitis	1.6%
Major complications§	6.2%
Deep incision surgical site infection	0.2%
Organ or space surgical site infection	0.2%
Pneumonia	0.6%
Unplanned intubation	1.6%
>48 hour ventilator-assisted respiration	1.0%
Pulmonary embolism	0.4%
Renal insufficiency or failure	0.2%
CVA with neurological deficit	1.0%
Coma of > 24 hours	0.2%
Cardiac arrest or MI	0.4%
Sepsis or septic shock	1.2%
Any complications¶	7.4%
Return to the OR within 30 days	3.4%
Discharged with continued care*	5.1%
Readmission within 30 days	7.7%
30-day mortality	0.6%

Conclusions

Commonly-available pre- and intraoperative factors are predictors of prolonged LOS and discharge destination, but not adverse outcomes in patients undergoing transsphenoidal excision of benign pituitary tumors. Given the cost and changing reimbursement patterns for LOS, it is important to identify and correct modifiable risk factors prior to surgery.

Table 3: Multivariate model for prolonged length of hospital stay (LOS) (N = 501)

Baseline characteristics	Prolonged length of stay (>4 days)
Minority race	2.1 (1.3-3.4)
Transferred from outside facility	18.5 (4.9-70.1)
ASA classification	
1 + 2	Reference
3 + 4	2.2 (1.4-3.6)
Length of surgery, mins, mean ± SD, (per 60 min)	1.8 (1.4-2.2)
Perioperative transfusion	11.5 (1.3-102.5)
Emergency	3.6 (1.1-11.9)