

Endocrine and Surgical Complications in Pure Endonasal Endoscopic Transsphenoidal Surgery: Contemporary Single Surgeon Experience in 420 Cases

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Learning Objectives

By the conclusion of this session, participants should be able to:
1)Describe the major complications of endoscopic transsphenoidal surgery
2)Describe risk factors for major complications in endoscopic transsphenoidal surgery,
3)Understand strategies and be more prepared for minimizing major complications in endoscopic transsphenoidal surgery 4)Inform patients of the likelihood of a major complications prior to surgery

Introduction

Some authors report fewer major complications in endoscopic transsphenoidal pituitary surgery than microscopic surgery. Few have reported their experience with non-pituitary lesions and many inconsistently report endocrine complications. We report the major endocrine and surgical complications after pure endoscopic transsphenoidal surgery in a consecutive series of 420 cases by a single surgeon.

Methods

A retrospective review of all patients who underwent endoscopic endonasal transsphenoidal surgery from April 1, 2008 to August 1, 2012 at the Brigham and Women's Hospital was performed. Extended transsphenoidal approaches were included. We excluded cases with operating microscope use. We recorded all basic demographic and clinical characteristics as well as details of major complications. Basic statistical analysis and multivariate logistic regression was performed.

Results

There were 102 major complications (in 83 patients) among the 420 purely endoscopic transsphenoidal cases (24.2%). The mean age was 47.6 years old (10-80), and 57% were female. Pituitary adenomas accounted for 304 (72.4%) cases, and 82 (19.5%) were recurrences. New endocrine dysfunction occurred in 50 (11.9%) patients, with 4.1% developing new central adrenal insufficiency, 2.9 % permanent diabetes insipidus, and 5.0 %

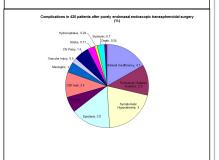
symptomatic hyponatremia requiring readmission. "Approach" related adverse events occurred in 22 (5.2%) patients: 3.8 % had epistaxis and 1.5 % sinusitis. Other complications included CSF leak (2.4%), vascular injury (0.5%), cranial nerve palsy (1.4%), and meningitis (1.0%). Extended transsphenoidal cases (p=0.003) and non-adenomas (p=0.01) were associated with higher risk of post-operative complication. Multivariate logistic regression revealed that an extended approach was the only independent risk factor for a major complication, OR 4.51 (CI 1.49 - 13.68).

Table 1: Demographics and Tumor Characteristics

	N = 420	complications	Group	
	patients	Group	N = 83 patients	
		N = 337 patients		
	47.3 (8-86) s.d	47.2 (8-86)	47.6 (10-80)	0.82
(range)	15.7	s.d. 16.0	14.6 s.d.	
Female, % (n)	227, (54.0)	179 (53.3)	48 (57.1)	0.07
Male, % (n)	(193) 46.0	158(47.7)	35 (42.9)	
Primary, %	338 (80.5)	267 (79.2)	71 (85.7)	0.17
(n)	82 (19.5)	70 (20.8)	12 (14.3)	
Recurrent, % (n)				
Extended, % (n)	29 (6.9)	17 (5.1)	12 (14.3)	0.003
Non- extended, % (n)	391 (93.1)	320 (94.9)	71 (85.7)	
Adenoma	304 (73.4)	252 (74.7)	52 (63.1)	0.01
Non-adenoma	116 (26.6)	85 (25.3)	31 (36.9)	
2D	342 (81.4)	274 (81.3)	68 (82.1)	0.85
3D	78 (18.5)	63 (18.7)	15 (17.9)	

Table 1: continued

	N = 420 patients	group N= 337 patients	group N = 83 patients	value
Pituitary Adenoma	304	252	52	
Macroadenoma	245 (80.6)	206 (81.7)	39 (75.5)	0.30
Microadenoma	59 (19.4)	46 (18.3)	13 (24.5)	
Functional	142 (46.9)	115 (45.8)	27 (50.9)	0.50
Non-functional	161 (53.1)	137 (54.2)	25 (49.1)	
Adenoma	304 (72.4)	252 (74.7)	52 (63.1)	
Rathke cleft cyst	41 (9.8)	28 (8.3)	13 (15.5)	
Craniopharyngioma	19 (4.5)	12 (3.6)	7(8.3)	
Other cyst	16 (3.8)	12 (3.6)	4 (4.8)	
Meningioma	1 (0.2)	1 (0.3)	0	
Chordoma	3 (0.7)	3 (0.9)	0	
Other	36 (8.6)	29 (8.6)	7 (8.3)	



Conclusions

Though endoscopic transsphenoidal surgery has its advantages, major complications still occur. Strategies to reduce complications are discussed. Recognition of these complications helps inform patients and better prepare surgeons, particularly in extended cases.

Discussion

Despite our inclusion of extended transsphenoidal cases and nonpituitary adenomas pathology (namely Rathke's cleft cysts and craniopharyngiomas), our results are comparable to other endoscopic series that focus on just pituitary adenomas, with respect to CSF leak, sinusitis, meningitis, vascular injury and CNS complications. Advances in anesthesia, imaging and neuronavigation and instrumentation have helped ensure low complication rates. We report higher than expected rates of epistaxis, however. In our most recent experience, we have utilized the rescue flap technique to ensure mucosal preservation of the sphenopalatine artery bilaterally in all cases and have noticed a dramatic decrease in epistaxis. Anterior and posterior pituitary deficiency has been reported inconsistently across all studies and SIADH is frequently not reported. Pituitary gland preservation and CSF leak prevention requires careful pre-operative planning, review of imaging and directed, careful dissection of the tumor or cyst. SIADH continues to be a difficult complication to predict, prevent and treat effectively; we limit intra- and post-operative fluid hydration up to 1 week post-operatively.

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