



Risks of Diabetes Insipidus Following Endoscopic Transssphenoidal Surgery

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Introduction

Diabetes Insipidus (DI) after endoscopic transnasal transssphenoidal surgery (ETSS) can lead to increased morbidity, longer hospital stays, and increased medication requirements. Predicting which patients are at risk for developing DI can help direct services to ensure adequate care and follow-up. Our objective of was to review our experience with ETSS and determine which variables can predict DI. This represents one of the largest North American series of this type.

Methods

We performed a retrospective review of a series of consecutive patients who had undergone ETSS for resection of sellar and parasellar lesions from 2006 to 2011. We examined patient and tumor characteristics and their relationship with developing DI.

Results

There were 172 patients total, mean age of 50 (range, 8-88). Ninety-seven (56%) patients were female, 75(44%) were male. One-hundred-twenty (70%) patients had adenomas, 21 (12%) had either Rathke’s cleft cyst (RCC) or craniopharyngioma. Overall 29 (17%) patients developed DI requiring medication (14 permanent and 15 transient). Average tumor volume was 6.4cc (5.5cc in non-DI group vs. 10.8cc in DI group [p<0.05]). Average immediate post operative sodium was 144.7 mEq/L in the DI group vs. 139 mEq/L in the non-DI group (p<0.05). Average change in sodium for DI group was 4.0mEq vs. -.3mEq for non-DI group (p<0.05).Thirty-one percent of DI patients had either an RCC or craniopharyngioma vs. only 7% of the non-DI group. Average urine output/hr for DI group was 322ml/hr prior to DDAVP vs 149.6ml/hr in non-DI group (p<0.05). Twenty-eight percent of permanent DI patients had a CSF leak vs. 10% of patient without DI.

Table 2

	No DI	Transient DI (<6 mo)	Permanent DI (>6 mo)	Overall DI	P value (Overall vs No)
Pre-op Na	139.3	140.5	140.6	140.5	>.05
Post-op Na	139	144.6	144.8	144.7	<.05
Δ Na	-0.3	4.1	3.8	4.0	<.05
Urine output proir to DDAVP	149.6	305.2	347.7	322.7	<.05
Total urine output / hr	149.6	237.0	232.0	234.9	<.05

Table 1

	Total no.	NO DI	Transient DI (<6 mo)	Permanent DI (>6 mo)	Overall DI	P value
Sex						
M	75	61	7	7	14	0.560
F	97	82	8	7	15	0.560
Adenoma size		5.5cc	12.9cc	8.4cc	10.7cc	0.016
CSF Leak	22	17	1	4	5	0.426

Table 3

	OR (T-DI vs No-DI)	95% CI (T-DI vs No-DI)	P-value (T-DI vsNo-DI)	OR (P-DI vsNo-DI)	95% CI (P-DI vs No-DI)	Pvalue (P-DI vsNo-DI)	OR (Overall vsNo-DI)	95% CI (Overall vsNo-DI)	Pvalue (Overall vsNo-DI)	
Rathke cleft cyst	3.75	0.89-15.73	0.071	4.09	0.97-17.34		0.056	3.94	1.28-12.12	0.017
Craniopharyngioma	3.36	0.33-34.47	0.308	7.83	1.20-51.53		0.032	5.42	1.04-28.35	0.045
Adenoma (Nonfunctioning)	0.42	0.14-1.30	0.133	0.63	0.21-1.92		0.421	0.52	0.23-1.17	0.114
Adenoma (ACTH)	1.99	0.22-18.22	0.544	2.14	0.23-19.71		0.502	2.06	0.38-11.17	0.402
Adenoma (PRL)	1.21	0.14-10.43	0.860	1.31	0.15-11.29		0.807	1.26	0.26-6.26	0.778
Adenoma (GH)	4.25	1.00-18.16	0.051	0.55	0.03-10.10		0.690	1.96	0.49-7.89	0.343
Adenoma (TSH)	10.21	0.61-172.34	0.107	3.30	0.13-84.73		0.471	5.11	0.31-84.09	0.254

Conclusions

Identifying perioperative risk factors for DI after ETSS will help physicians care for patients postoperatively. Pre-operative risk factors for the development of DI included histology, tumor size, post-op sodium, change in sodium, and urine output. Immediate post-operative sodium was predictive for develop permanent DI. These findings are consistent with other reports from microscopic surgical series. These data can help plan treatment algorithms, ICU stays and increase vigilance in at risk patients.

Learning Objectives

- By the conclusion of this session, participants should be able to:
- 1) Describe the important risk factors that may predict Diabetes Insipidus in a post operative setting after endoscopic transphenoidal surgery
  - 2) Discuss, in small groups what steps can be taken to minimize this complication after surgery
  - 3) Identify an effective treatment algorithm if/when this condition develops

References

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