

INTRODUCTION

- Unplanned readmission to the hospital after discharge following surgical procedures is an important patient care concern, health economics metric, and health care quality measure.
- Despite the widespread use of transsphenoidal surgery as a standard neurosurgical procedure for symptomatic pituitary tumors, there have been very few studies exploring unplanned readmissions.
- The primary objective of this study was to analyze the causes of 30-day unplanned readmission after transsphenoidal surgery for pituitary tumors.

METHODS

- Patients who underwent endoscopic transsphenoidal resection of pituitary adenoma over 12 year period at a single tertiary center were selected.
- Inclusion criteria:**
Any readmission within 30 days from date of discharge of initial surgery.
- Exclusion criteria:**
Hospital encounters and emergency visits that did not result in admission
- All causes of readmission were divided into 3 categories – directly related to pituitary adenoma resection, indirectly related and unrelated.
- Indirect causes included causes accentuated by the surgical procedure (Ex: Venous thrombosis) while unrelated causes included readmission due to co-existing comorbidities (Ex: liver disease, renal failure etc).
- Statistical analysis:**
Pearson Chi-square test and t-test was utilized to calculate level of significance. Logistic regression and cross tables used to perform univariate analysis for odds ratio.

RESULTS

- 631 patients underwent 676 surgeries during the study period.
- Males accounted for 53% and mean age was 53.77 ± 15.3 years
- 30-day readmission was seen in 9.6% of all surgeries (N = 65).
- Majority (66%) of unplanned 30-day readmissions occur within the first 10 days.
- Directly related causes accounted for 57%, indirectly related causes were 20% and the remaining were either unknown or unrelated causes.
- 48% of the directly related causes were due to hormonal imbalance namely SIADH (29%), diabetes insipidus (14%) and hypocortisolemia (5%).
- 90% of SIADH occurred within first 7 days of discharge

- The most frequent (60%) indirectly related cause was deep vein thrombosis (N = 9).
- Mean days after date of discharge (after initial surgery) for SIADH was 4.66 ± 2.05 days while, for deep vein thrombosis, it was 15.44 ± 9.27 days.

RISK FACTORS FOR 30-DAY READMISSION

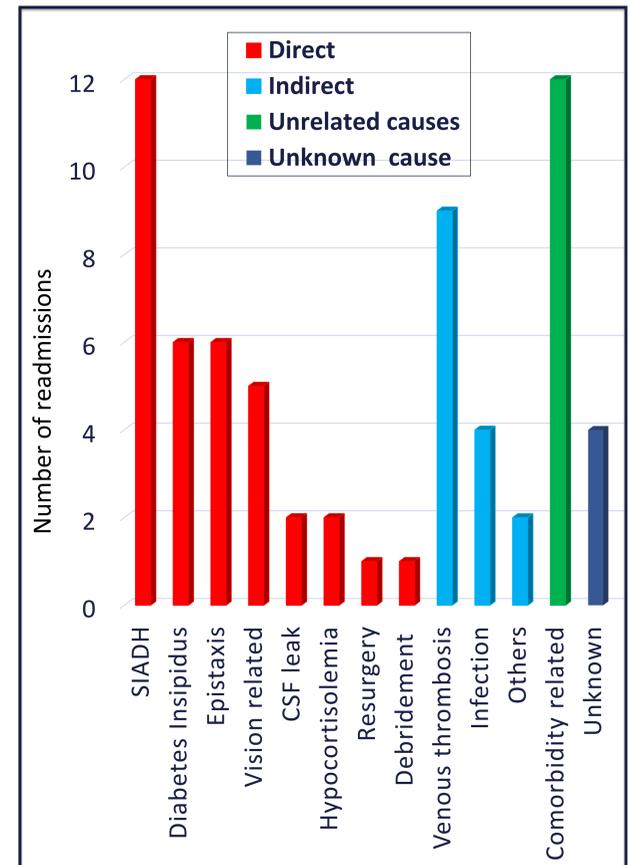
PREOPERATIVE PATIENT RELATED FACTORS	P VALUE	OR (95% CI)
Thromboembolism	<0.0001	8.9 (4.0-20.2)
Body mass Index	0.004	1.05 (1.01-1.09)
Atrial fibrillation	0.06	
COPD	0.14	
Hypertension	0.15	
Gender	0.32	
Myocardial infarction	0.36	
Congestive heart failure	0.39	
Obstructive sleep apnea	0.5	
Age	0.77	

INTRAOPERATIVE TUMOR RELATED FACTORS	P VALUE	OR (95% CI)
Apoplexy	0.005	2.69 (1.31-5.52)
Dural reconstruction (Nasoseptal flap had highest risk)	0.04	2.47 (0.98-6.19)
Dural reconstruction (Surgicel™ vs. Dural substitute)	0.10	
Intraoperative CSF leaks	0.12	
Cavernous sinus invasion	0.14	
Extent of resection (Complete vs. Partial)	0.30	
Macroa vs. Microadenoma	0.48	
Optic Nerve (Compressed vs. No involvement)	0.64	
Tumor volume	0.76	
Clinical tumor type (Primary vs. Recurrent)	0.77	
Invasiveness (Dural & Bony)	0.83	
Secretory vs. Non-secretory	0.85	
Optic Nerve (Abuts nerve vs. No involvement)	0.95	
Tumor size (based on largest diameter)	0.97	

COMPARISON BASED ON CAUSE OF READMISSION

VARIABLES	ALL CAUSES	DIRECT CAUSES	INDIRECT CAUSES
Number of readmissions	74	42 (57%)	15 (20%)
Mean number of readmissions	1.12 ± 0.4	1.05 ± 0.3	1.25 ± 0.62
Hospital stay during readmission	4.6 ± 4.3d	4.9 ± 4.07d	4.31 ± 4.6d
Days after discharge from initial surgery	9.9 ± 8.4d	7.8 ± 7.3d	11.8 ± 8.6d

CAUSES OF 30-DAY READMISSION



(Others included logistic issues and gastritis)

CONCLUSIONS

- Clinical risk factors including preoperative thromboembolism, higher BMI, apoplexy and usage of nasoseptal flap for dural reconstruction are significantly associated with higher risk of 30-day readmission.
- Endocrine disturbance (mainly SIADH) and deep venous thrombosis are the most common causes of unplanned readmission.
- Majority of the 30-day readmissions occur within the first 10 days while, SIADH mainly occurs within first 7 days of discharge. Deep venous thrombosis usually occurs after 14 days of discharge.
- Based on our data, we recommend strict post-discharge surveillance for hormonal imbalance (sodium and cortisol levels) and venous thrombosis in order to reduce unplanned hospital readmissions.

REFERENCES

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- Rizvi ZH, Ferrandino R, Luu Q, Suh JD, Wang MB. Nationwide analysis of unplanned 30-day readmissions after transsphenoidal pituitary surgery. Int Forum Allergy Rhinol. 2018.

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