

Development and Validation of a Risk Score to Predict Visual Recovery in Patients with Pituitary Adenoma

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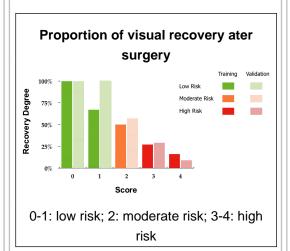
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Introduction

Previous attempts to search risk factors that predict visual recovery after transsphenoid pituitary adenoma resection were limited. A new risk score system based on preoperation ophthalmology examination, which could identify patients with poor post-operative visual recovery is built.

Methods

Risk score is developed from 35 patients with pituitary adenoma. The score is then applied to 30 additional patients in a validation group. Thorough ophthalmology and radiology examination was performed before the trans-sphnoidal operation. Following data are recorded for each patient: age, gender, visual acuity, pathology, tumor height on MRI, course of disease, static automated perimetry (SAP), multi-focal visual evoked potential (mfVEP), retinal nerve fiber layer (RNFL) and functional magnetic resonance image (fMRI). The risk score is constructed based on B-coefficients in logistic regression.



Conclusions

A clinical score is developed and successfully validated for predicting visual recovery after transsphenoidal pituitary adenoma resection.

	Variable	β-coefficient	Р	Score
SAP	<1			0
	≥1	1.16	0.012	1
RNFL (µm)	>75			0
	≤75	1.01	0.01	1
mfVEP	<0.5			0
	≥0.5 and <1.0	1.18	0.029	1
	≥1.0	1.81	0.002	2

Results

Predictors of poor visual recovery included SAP, RNFL and mfVEP. Low-, moderate-, and high-risk ranges are 0 to 1, 2, and 3 to 4 points, respectively. The score performes similarly in each data set, without loss of ovrall acuracy as measured by C statistic from training sets (0.786) to validation set (0.768). The similarity of the recovery rates in training and testing samples within each stratum reflects good calibration. The recovery degree of visual field ranged from 67% to 100% (low risk score), from 50 to 57% (moderate risk score) and from 9% to 29% (high risk score).

Learning Objectives

- 1) Describe the newly designed score,
- 2) Discuss the usage in clinical practice,
- 3) Identify a more efficient way to improve.

Score	Training Sample (131)			Validation Sample (110)		
	No. of recovery	No. at risk	Percentage	No. of recovery	No. at risk	Percentage
0	5	5	100%	7	7	100%
1	18	27	67%	16	16	100%
2	13	26	50%	12	21	57%
3	10	37	27%	6	21	29%
4	6	36	16%	4	45	9%

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