



Introduction

The trans-sphenoid approach for the recurred or residual pituitary adenoma after microscopic resection is challenging. We reported the outcomes of endoscopic endonasal approach (EEA) for the recurred or residual pituitary adenomas.

Methods

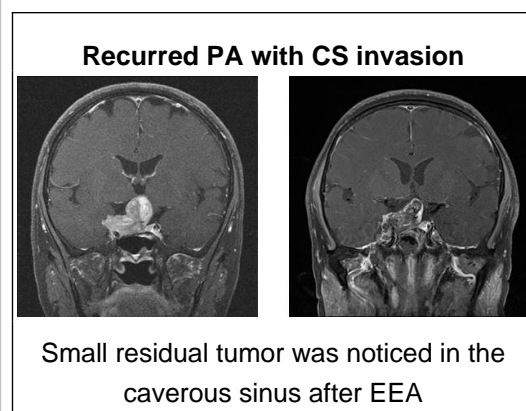
From February 2010 to February 2013, EEA was performed for 6 recurred and 24 growing residual pituitary adenomas (male:female = 9:21) after microscopic trans-sphenoid resection. Twenty seven (90%) patients had a clinically non-functioning pituitary adenoma. A residual pituitary adenoma was defined as a pathologically proven pituitary adenoma with evidence of residual tumor growth on serial MRIs by volumetric analysis. We have a policy of recommending revision surgery only for recurrent or growing residual tumors with clear clinical evidence of a mass effect. Twenty four (80%) patients suffered from the visual disturbance related with the tumor growth. The visual status was analyzed according to the guidelines of the German Ophthalmological Society, which assess bilateral visual acuity and field using the visual impairment scale (VIS). The VIS ranges from 0 (best) to 100 (worst).

An early morning basal hormone study was performed in all patients, and the adrenocortical axis was evaluated by a cocktail test or a rapid adrenocorticotrophic hormone-stimulating test before and 3 months after surgery. In cases with a growth hormone-secreting tumor, disease control was determined by the following criteria from the 2010 consensus guidelines. Remission of Cushing’s disease was defined as adequate suppression of serum cortisol in the morning after administering 1 mg of dexamethasone and normalization of urinary free cortisol excretion . The volumetric analysis was performed in all cases based on the pre- and post-operative MRIs in order to calculate the resection rate of tumor.

Results

Tumor control

The tumor volume ranged from 0.1 to 41.8 ml (mean, 11.7 ml). All three tumors less than 1 ml were functioning pituitary adenomas.



The gross total resection was achieved in a half of patients. Complete removal was possible in one (17%) of six recurrent tumors and fourteen (58%) of twenty-four residual tumors, respectively. The tumor resection rate ranged from 52% to 100% (mean, 90%, median 99%). Resection rates of over 90% and 70% were achieved in 20 (67%) and 28 (93%) patients, respectively.

Knosp Grade and Resection Rate		
Knosp Grade	n	Resection rate (%)
0	11	100
I	1	100
II	3	100
III	5	88.4
IV	7	79.3

Ophthalmological outcomes

The mean pre- and post-operative VISs were 43.1 and 26.8, respectively. The visual symptom was improved in 19 (79%) out of 24 patients with subjective visual symptoms and no visual deterioration was reported in all patients. The mean pre- and post-operative VIS scores in patients with tumor-related visual deterioration were 48 and 28, respectively.

Endocrinological outcomes

The endocrinological cure was achieved in all three functioning pituitary adenomas.

The post-EEA follow-up endocrinological examination revealed a new endocrinological deficit in any patients.

Complications

Two patients required the antibiotics management for the post-operative meningitis. There was no CSF leakage after surgery.

Conclusions

The tumor resection rate in EEA for recurred or growing residual pituitary adenomas was closely related with the degree of cavernous sinus invasion. The ophthalmic and endocrinological outcomes of revision EEA were comparable with those of microscopic TSA for virgin cases. Therefore, the EEA could be the valuable treatment option for the recurred or growing residual pituitary adenomas after microscopic trans-sphenoid approach with the acceptable outcome.

Learning Objectives

Advantages and risks in the surgical management of recurred or residual pituitary adenomas