

Long-term results of pure endonasal endoscopic transsphenoidal resection of nonfunctioning pituitary macroadenomas in patients with a minimum of 5 year follow up

Robert Dallapiazza MD PhD; Robert M. Starke MD MSc; Edward R. Laws, Jr. MD FACS FAANS; John Jane, Jr

1.) University of Virginia Health System, Department of Neurosurgery, Charlottesville, VA

2.) Brigham and Women's Hospital, Pituitary/Neuroendocrine Center, Boston, MA



Introduction

Several studies report early results of endoscopic endonasal transsphenoidal surgery, however few discuss long-term outcome measures.

Nonfunctioning macroadenomas are often quite large at presentation and frequently have suprasellar extension and cavernous sinus invasion. Several groups have reported early results of endoscopic transsphenoidal surgery for NFPA. However, long-term outcomes including tumor recurrence and need for secondary procedures is not yet been reported. The purpose of this study is to report outcomes for patients who have undergone ETSS for NFPA with longer than 5 years of follow up.

Methods

This is a retrospective review of a prospectively collected database. All patients underwent endoscopic transsphenoidal resection of a nonfunctioning pituitary macroadenoma. Patients were included if they had at least 5 years of clinical and imaging follow up. Patient records were reviewed for neurological and endocrinologic outcomes, recurrences, and additional surgical procedures.

Table 1: Extent of resection and recurrences

	GTR, N (%)	Recurrence, N (%)*
Overall	57 (71)	18 (23)
Knosp score, N (%)		
0	7 (100)	0 (0)
1	16 (89)	1 (5.5)
2	18 (86)	3 (14)
3	7 (41)	8 (47)
4	0 (0)	4 (50)
Tumor Diameter, cm		
1-1.9	15 (88)	0
2-2.9	22 (76)	6 (21)
3-4	16 (73)	6 (27)
>4	1 (11)	6 (67)
Tumor volume, N (%)		
<10 cm ³	46 (84)	10 (18)
>10 cm ³	7 (35)	7 (35)
Previous MTSS	6 (35)	5 (29)

Table 2: Univariate predictors of recurrence or progression

Variable	No recurrence, N (%)	Recurrence, N (%)	Significance, P-value
Male sex	30 (71)	12 (29)	0.212
Age (>65 yr)	18 (82)	4 (18)	0.120
Visual deficit	28 (67)	14 (33)	0.043
Endocrinopathy	42 (78)	12 (22)	0.79
Knosp Score			
0-2	42 (91)	4 (9)	0.012
3,4	13 (52)	12 (48)	
Volume			
<10 cm ³	44 (80)	11 (20)	0.673
>10 cm ³	10 (59)	7 (41)	
Invasion			
MRI	22 (61)	14 (41)	0.013
Surgical	21 (60)	15 (40)	0.007

Results

Eighty patients met the study criteria. Seventy-one percent of patients had no residual on MRI at 1-year follow up. Patients with Knosp grade 0-2 tumors and tumor volumes <10 cm³ were significantly more likely to have received a gross total resection compared to patients with Knosp grade 3, 4 tumors or volumes >10 cm³. At long-term follow up, there were 7 (12%) recurrences in patients who had received grossly complete resections. In patients who had subtotal resections, 11 (61%) progressed radiographically and 3 (17%) had symptomatic progression. Knosp score, surgical and radiographic evidence of invasion, and preoperative visual deficits were predictive of recurrence in a univariate analysis. Five percent of patients had major surgical complications.

Conclusions

At long term follow up 12% of patients had recurrent tumors after gross total resection. Recurrent or residual tumors were treated with either repeat surgery or GKRS. Rates of complete resection, postoperative surgical and endocrinological complications, and additional surgical procedures are similar to previously published reports after microscopic transsphenoidal surgery.

Learning Objectives

- 1.) The incidence of tumor recurrence after a grossly total resection is 12%.
- 2.) The rate of radiographic progression after subtotal resection is 61% without further treatments.

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