Retrospective Analysis of Microscopic Versus Endoscopic Transsphenoidal Surgery for Nonfunctioning Pituitary Macroadenomas with Knosp Grade 0-2

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Objective

to compare surgical outcomes and complications in a contemporaneous series of patients undergoing either microscopic or endoscopic transsphenoidal surgery for nonfunctioning pituitary macroadenomas without imaging evidence of cavernous sinus invasion.

Table 1: Patient demographics

	Microscopic TSR	Endoscopic TSR	p Value
Patient Number	43	56	
Age at surgery, y +/- SD	56.7 +/- 16.9	56.2 +/- 12.8	p = 0.85
M/F	24/19	27/29	p = 0.45
Preoperative visual field defects, n (%)	22 (51)	22 (39)	p = 0.24
Compression of optic chiasm, n (%)	28 (65)	39 (70)	p = 0.63
Preoperative Endocrinopathy, n (%)	19 (44)	25 (45)	p = 0.96
Panhypopituitarism	3	4	
Hypogonadism	10	11	
Amenorrhea	4	3	
Other	2	7	

Methods

This is a retrospective analysis of a prospectively collected database from a single institution. Data were collected from patients whose surgery occurred from June 2010 to January 2013. Patients who underwent microscopic or endoscopic surgery for nonfunctioning pituitary macroadenomas that had Knosp scores 0, 1, and 2 were included. Patients who had clinically-secreting tumors, tumors with Knosp scores 3 and 4, and patients who were undergoing revision surgery were excluded. Eligible patient records were analyzed for outcomes and complications. Statistical analyses were performed on tumor volume, intraoperative factors, and postoperative complications. The results were used to compare the microscopic and endoscopic approaches.

Table 2: Tumor size

	Microscopic TSR	Endoscopic TSR	p Value
Knosp 0, n (%)	3	11	p = 0.04
Tumor volume Knosp 0, mm^3	21.5 +/- 7.7	22.8 +/- 6.7	p = 0.77
Knosp 1, n (%)	18 (42)	23 (41)	p = 0.93
Tumor volume Knosp 1, mm^3	30.2 +/- 12.3	27 +/- 9.6	p = 0.36
Knosp 2, n (%)	22 (51)	22 (39)	p = 0.23
Tumor volume Knosp 2, mm^3	32.9 +/- 7.9	34.6 +/- 9.4	p = 0.44
Ave Knosp score	1.44 +/- 0.63	1.20 +/- 0.75	p = 0.09
Ave Tumor volume, mm^3	31.0 +/- 10.2	29.2 +/- 10.2	p = 0.38

Table 3: Results by Knosp score

	Knosp 0	Knosp 1	Knosp 2	p Value
Microscopic extent of resection (%)				
Estimated at surgery	100	94	91	p = 0.81
MRI 2 months	100	88	84	p = 0.97
MRI 1 year	100	88	89	p = 0.86
Endoscopic extent of resection (%)				
Estimated at surgery	100	100	91	p = 0.20
MRI 2 months	91	91	90	p = 0.55
MRI 1 year	91	78	82	p = 0.87
Postoperative CSF leak (n)				
Microscopic	0	1	4	p = 0.40
Endoscopic	0	2	2	p = 0.69
New Endocrinopathy (n)				
Microscopic	2	6	12	p = 0.31
Endoscopic	5	12	8	p = 0.67

Conclusions

The microscopic and endoscopic techniques provide similar outcomes in the surgical treatment of Knosp grade 0-2 nonfunctioning pituitary macroadenomas.

Results

Forty-three patients underwent microscopic transsphenoidal surgery, and 56 patients underwent endoscopic transsphenoidal surgery. There were no statistical differences in intra-operative extent of surgical resection or endocrinological complications. There were significantly more intraoperative CSF leaks in the endoscopic group (58% versus 16%), but there was no difference in the incidence of postoperative CSF rhinorrhea (12% versus 7%, microscopic versus endoscopic). Length of hospitalization was significantly lower in patients undergoing an endoscopic approach (3.0 versus 2.4 days, microscopic versus endoscopic). Two-month follow up imaging was available in 88% of patients, and 42% of patients had 1-year follow up imaging. At 2-months, there was no evidence of residual tumor in 77% and 87% of patients in the microscopic (27/35) and endoscopic groups (45/53), respectively. At 1 year, 85% of patients had no evidence of residual tumor in the microscopic group (17/20) and 79% had no evidence of residual tumor in the endoscopic group (19/24).