

Learning curve in progression from microscopic to endoscopic technique in transsphenoidal surgery for pituitary adenomas – A surgical audit.

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Introduction

Improvement in intraoperative and postoperative parameters for 3 experienced neurosurgeons was analysed, as they shift from microscopic to endoscopic approach for pituitary adenomas.

Methods

Retrospective analysis of 110 consecutive patients who underwent endoscopic endonasal binostril transsphenoidal surgery for pituitary adenomas at AIIMS was done. Patients were evaluated for preoperative symptoms, tumor size, hormonal deficits and visual status. Intraoperative CSF leak, blood loss, operative time, sinus/ICA injury and conversion to microscopic technique were evaluated. Postoperative visual status, neurological status, hormonal imbalance, electrolyte imbalance, meningitis were evaluated along with percentage of tumor excision. All cases were divided into two equal groups, early and late, and early results were compared with later results to look for learning curve. Additionally learning trend of 3 surgeons was individually analysed and compared with overall trends.



Sellar floor drilling



Dural incision





Results

half.

110 cases were operated by 3 surgeons; each with experience of 7+ years and operated >100 pituitary cases microscopically. Comparing first 55 cases operated with second 55, mean postoperative stay decreased from 8.67 to 5.5 days(p=0.002). Operative time decreased from 145.5 minutes to 135.5 minutes. There was significant improvement in gross total resection with 16 (29%) in first half and **37 (67%)** in second half (p=0.000). Despite mean preoperative tumor size being marginally larger in the second half(6.59 v/s 6.38cc), mean postoperative size of residual tumor reduced from **1.32cc** to 0.72cc(p=0.085). Most significant difference was improvement in extent of resection from first half(85.03%) to second half(92.41%) (p=0.008). Visual improvement was seen in 6 patients(10.9%) in first group, and 10 patients(18.2%) in second group(p=0.279). 3 patients(5.5%) had postoperative meningitis and 1 (1.8%) had mental status deterioration in first half while there were none in second



Characteristics	First half	Second half	p Value
Visual Improvement	6 (10.9%)	10 (18.2%)	0.279
Electrolyte Imbalance	10 (18.2%)	10 (18.2%)	1
Meningitis	3 (5.5%)	0	1.079
GCS Deterioration	1 (1.8%)	0	0.315
Death	0	0	1
Redo Surgery			0.517
Trans-sphenoidal	3 (5.5%)	3 (5.5%)	
Trans-cranial	1 (1.8%)	0	
Mean Post-operative stay (days)	8.67	5.55	0.002
Mean Pre-op Size (ml)	6.38	6.59	0.851
Mean Post-op Size (ml)	1.32	0.72	0.085
Mean Percentage Excision	85.03%	92.41%	0.008
Gross Total Excision	16 (29.1%)	37 (67.3%)	0.000

Conclusions

- Endoscopic transsphenoidal approach for pituitary adenomas is novel technique and requires technical expertise.

- Our results demonstrate that there is definite learning curve to master its subtle nuances, but with more case experience, operative outcomes show marked improvement.

- In a multi-surgeon unit, overall improvement in outcomes was replicated in individual surgeons' internal audits.



प्रागेग्माहां खल धर्मसाधन

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