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Original Research Article.

Surgical Outcome of Endoscopic Endonasal Surgery for Non-Functional Pituitary Adenoma

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ABSTRACT

Background: Pituitary adenomas are the third most common intracranial neoplasm, accounting for 10%–25% of intracranial neoplasms with a prevalence of 16.9%. Recently for treating pituitary adenomas two important endoscopic approaches are used: a uninostril endonasal transsphenoidal approach and a binostril endonasal transsphenoidal method.

Objective: Main goal is to identify most suitable approaches and evaluate the efficiency rate of uninostril and, endoscopic binostril method for treating pituitary adenomas.

Method: In this retrospective study, 54 consecutive patient (Group A: binostril-34, Group B: uninostril-20) underwent endoscopic transsphenoidal binostril and uninostril surgery.

Results: Uninostril endonasal approach provided the less amount of surgical freedom because axial plane freedom was limited by the nasal speculum than binostril method and surgery with uninostril approach patients visual acuity was 80% which was 6% lower than binostril approach.

Conclusion: Binostril endoscopic approach is one step better for treatment of Pituitary adenoma. For measuring better outcome need further quantitative and qualitative data.

Keywords: Pituitary Adenomas, Uninostril, Binostril Transsphenoidal Method.

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INTRODUCTION

Pituitary adenomas are tumors that occur in the pituitary gland. Pituitary adenomas are generally divided into three categories dependent upon their biological functioning: benign adenoma, invasive adenoma, and carcinomas. Most adenomas are benign, approximately 35% are invasive and just 0.1% to 0.2% are carcinomas.[1] Pituitary adenomas represent from 10% to 25% of all intracranial neoplasms and the estimated prevalence rate in the general population is approximately 17%.[1,2] Endoscopic endonasal pituitary surgery become increasingly more common for treating Pituitary adenomas. The endoscopic endonasal transsphenoidal approach (eTSS) allows more panoramic visualization and wider access to the skull base. In this approach a neurosurgeon or an otolaryngologist, using an endoscope that is entered through the nose, fixes or removes brain defects or tumors in the anterior skull base. There different endoscopic endonasal transsphenoidal approaches were used recently for treating pituitary adenomas where one of the most two important endoscopic approaches are used: a uninostril endonasal transsphenoidal approach and a binostril endonasal transsphenoidal approach. In Uninostril Endoscopic Endonasal Transsphenoidal Approach doctor use the right nostril to approach the nasal cavity, and the middle turbinate was out-fractured. The sphenoid ostia were identified bilaterally and opened widely with a mushroom punch or Kerrison rongeurs. The posterior third of the bony septum was resected, along with a piece of the vomer. The sphenoid rostrum was then opened wide with a drill or punch, and bilateral posterior ethmoidectomies were performed. In the case of binostril endoscopic endonasal, this method is very much similar with binostril method but the contralateral posterior septal mucosa was removed, and the left middle turbinate was out-fractured so that the endoscope could be inserted through the right naris and the dissector could be inserted through the left naris. In this study our main goal is to identify most suitable approaches and evaluate the efficiency rate of uninostril and endoscopic binostril method for treating pituitary adenomas.

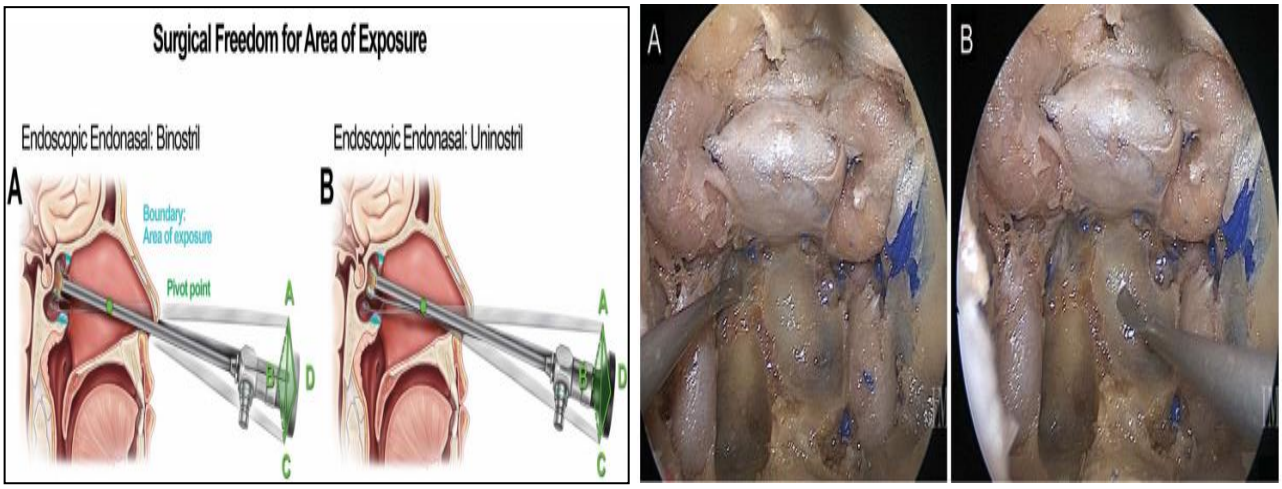

Figure 1a and 1b: Still images showing the surgical freedom and for the endoscopic uninostril (A), endoscopic binostril (B)[3]

OBJECTIVES

General Objective

- To detect most suitable approaches for pituitary adenomas

Specific Objective

- To evaluate the efficacy between uninostril and endoscopic binostril method.
- To identify Postoperative acuity, change after surgery of pituitary adenomas patients.

METHODOLOGY

Study Type: This study was a retrospective study

Study Place and Period: This study was conducted at a private hospital in Dhaka between January 2014 to January 2015.

Inclusion criteria:

- Patients diagnosed with nonfunctioning PA
- No previous surgical procedure for treatment of the lesions

Methods: In this retrospective study, 54 consecutive elderly patients with male and female (55.48 ± 14.802) underwent endoscopic transsphenoidal binostril and uninostril surgery where the clinical and radiological results were compared with 2 groups Where Group A: binostril-34 and Group B: uninostril-20. A facial CT scan was used in all patients to evaluate the paranasal sinuses (septal anatomy, turbinate anatomy, sphenoidal, and maxillofacial format) for surgical planning. There was no significant difference regarding the technique used for the treatment of elderly patients.

Statistical Analysis: All data are expressed as the mean ± SD. The statistical software SPSS version 16.0 (SPSS Inc.) was used for data analysis. The Fisher test was used for evaluation of categorical data, with $p < 0.05$ considered statistically significant.

RESULTS

In Table-1 shows preoperative characteristics of the patients where age range was 22–80.

In figure 2a and 2b shows gender demonstration for binostril and uninostril method where for binostril male percentage is 82% where as for uninostril method male percentage is 75%.

In Table-2 shows Two-Tailed t Test P Values for Each Approach Compared With a an endoscopic binostril approach and endoscopic uninostril approach where in Binostril approach EUN, endoscopic Uninostril p value represents a statistically significant superiority and in uninostril approach: EBN, endoscopic Binostril p value represents a statistically significant inferiority.

In figure-2 shows Postoperative acuity change where for uninostril approach patient's visual acuity was 6% lower than binostril approach.

In figure-3 shows complication after surgery where 12% for binostril approach and 15% patients for uninostril method faces sinusitis. In figure-4 shows length of hospital stay for uninostril and binostril approach where patients with binostril approach stay less in hospital than uninostril.

Table 1: Preoperative characteristics of patients with binostril and uninostril method

Parameter	Value
Age (yrs.) mean ± SD	55.48 ± 14.802
Median	54
Range	22-80
Sex	
Male	20
Female	34
Endocrine dysfunction syndrome	40
Prior surgery	13
prior radiation	2
Prior Medical Management	
Yes	13
No	41
Visual Acuity Deficit	
Yes	33
No	21

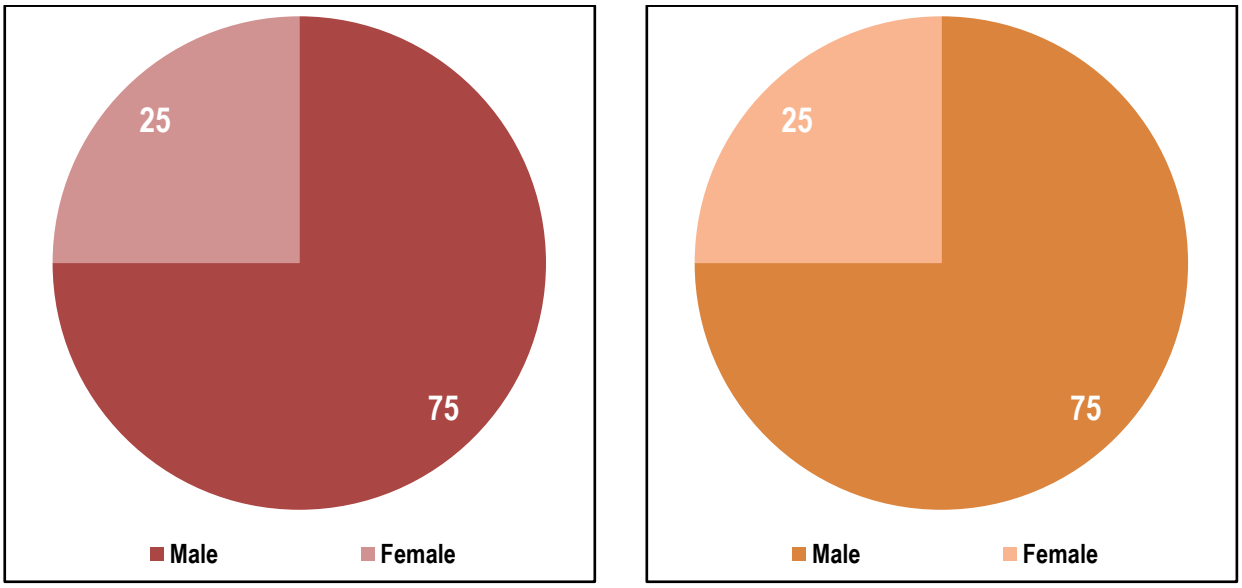

Figure 2a and 2b: Gender demonstration for binostril and uninostril method

Table 2: Two-Tailed t Test P Values for Endoscopic Binostril Approach and Endoscopic Uninostril Approach

Surgical Approach	Angle of Attack						Surgical Freedom			Exposed Area
	Axial			Sagittal			Anatomic Target			
	Pit I	IcICA	CcICA	Pit I	IcICA	CcICA	Pit I	IcICA	CcICA	
Endoscopic binostril approach: EBN	0.003[b]	0.09	0.3	0.0003[b]	0.0000003[b]	0.002[b]	0.0003[b]	0.02[b]	0.002[b]	0.0002[b]
Endoscopic uninostril approach: EUN	0.003[c]	0.09	0.3	0.0003[b]	0.0000003[c]	0.002[c]	0.0003[c]	0.01[c]	0.002[c]	0.0002[c]

***Source by: https://academic.oup.com/ons/article-abstract/11/1/69/2417292**

*Where C-cICA, contralateral cavernous internal carotid artery; EBN, endoscopic binostril; EUN, endoscopic uninostril; I-cICA, ipsilateral cavernous internal carotid artery; Pit, pituitary gland. Here [b] Represents a statistically significant superiority and [c]Represents a statistically significant inferiority.

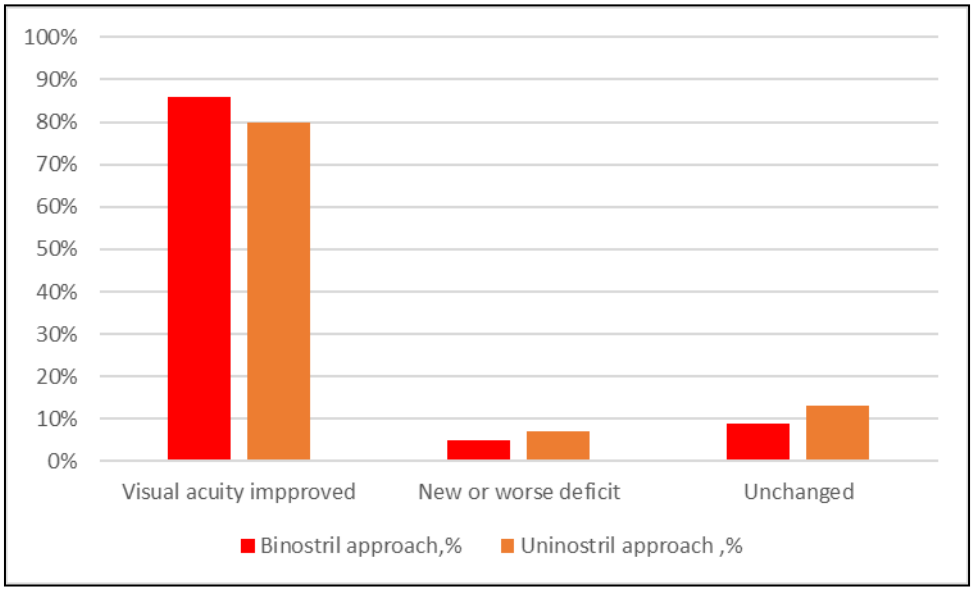

Figure 2: Postoperative acuity change

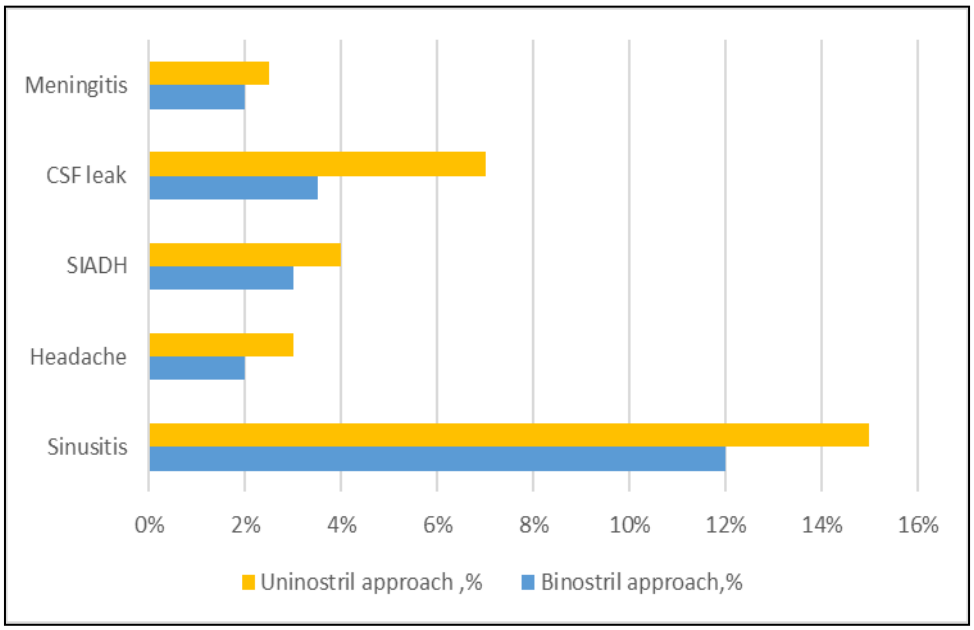

Figure 3: Complication after surgery

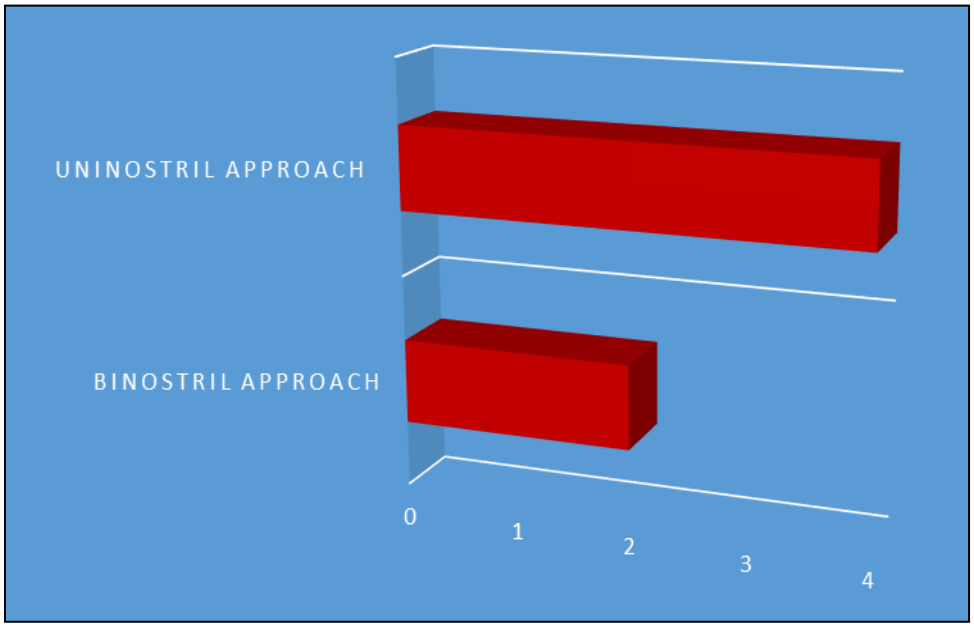

Figure 4: Length of hospital stay for uninostril and binostril approach

DISCUSSION

Pituitary adenoma accounts for almost 10–15% of all primary brain tumors and clinically non-functioning pituitary adenoma (NFPA) covers almost one third of pituitary adenomas.[4,5] The two most usually used endoscopic approaches for pituitary adenomas are the binostril and uninostril transsphenoidal approaches. Surgical outcomes, preoperative characteristics, postoperative quality of life, hospital stay rate are the four most significant principles that evaluate the efficiency of these two approaches. For general pituitary adenomas, some recent literature reported that the two methods had similar results. In table-2 shows that uninostril approach provided the less amount of surgical freedom because axial plane freedom was limited by the nasal speculum than binostril method. In many other reports also demonstrated same result.[6]

After surgery with uninostril approach patients visual acuity was 80% which was 6% lower than binostril approach and there was only 7% patients had no change for their visual acuity when they had binostril endoscopic surgery. After facing surgery with binostril approach 12% patients dealt with sinusitis where using uninostril method the percentage of sinusitis gets higher. In the case of hospital stay rate patients with binostril method stay only 2 days whereas for uninostril method this rate is a little bit high.

LIMITATIONS

- To standardize the methodology, we chose to use only straight instruments and 0▫ endoscopes.
- Small sample size and study period was short

CONCLUSION

The endoscopic binostril approach provides the greatest degree of sagittal surgical freedom and freedom at common anatomic targets within the sellaalsoon the basis of complication, quality of

improvement and hospital stay rate binostril approach is one step better for treatment of Pituitary adenoma. For measuring better outcome need further quantitative and qualitative data.

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