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## **Study of endoscopic transnasal trans-sphenoidal approach in pituitary macroadenoma**

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**Abstract**---Introduction: Pituitary Adenomas account for approximately 10-15% of all intracranial tumors. They are classified according to their secretory activity, presenting with varied hormonal and visual symptoms. The aim of treatment of pituitary adenomas is reversal of endocrine dysfunction with preservation of normal pituitary function, along with decompression of nervous structures and control of tumor growth in large tumors. Aims and Objective: The aim of this study was to report the efficacy and safety of Trans- Sphenoidal surgery. Material and Methods: 30 cases were included in the study. All patients were assessed clinically for visual symptoms, endocrine signs and symptoms, headache and others. Clinical and radioimaging preoperative assessment was done in all patients. Reassessment was done accordingly in postoperative period and in follow up examination. Immediate postoperative outcome (course), complications, postoperative radiotherapy or medical therapy results were assessed. Results: Most common age group was 41-50 years, with male:female incidence 1:1.3. Headache followed by Visual disturbance were the most common clinical symptoms observed. Commonest field defect observed was bitemporal hemianopia. Increased GH level (33%) followed by hyperprolactinemia (13%) were

the most common endocrinologic abnormalities. Post operative complications of CSF leak and Diabetes insipidus were observed. Conclusion: Trans-Sphenoidal surgery is the primary treatment of choice for pituitary tumors, with the surgical objectives of elimination of mass effect, and preservation and restoration of pituitary functions. The aggressive surgical resection undertaken when attempting cure must be balanced by understanding the potential surgical morbidity. Preservation of function of pituitary stalk, optic apparatus and hypothalamus is essential in attaining desirable postoperative result.

**Keywords**--pituitary macroadenoma, endoscopic transnasal trans-sphenoidal, hormone secretion, bitemporal hemianopia.

## **Introduction**

Pituitary Adenomas, which account for approximately 10-15% of all intracranial tumors in surgical series, usually are classified according to their secretory activity as growth hormone secreting adenomas, prolactin secreting adenomas, AdrenoCorticotropin secreting adenomas, Thyrotropin secreting adenomas and clinically non secreting adenomas(NFPA) <sup>1-4</sup>. Clinical manifestations of pituitary adenomas are the result of excess hormone secretion (acromegaly, hyperprolactinemia, hypercortisolism, hyperthyroidism) and/or to compression of surrounding structures (hypopituitarism, headache, visual disturbances, oculomotor palsy).

The Trans-Sphenoidal midline route represents the standard approach to the pituitary and sellar area and is used for more than 95% of surgical indication in the region <sup>5,6</sup>. This is because of the versatility of the Transsphenoidal approach for a variety of lesions in sellar area and is based on solid foundation. It is the least traumatic route to sellaturcica; it avoids brain retraction and provides excellent visualization of pituitary gland and lesions related to that structure. As a result of this advantage, it is usually more effective and offers lower morbidity and mortality rates when compared with Transcranial procedure <sup>7-9</sup>.

## **Aims and Objectives**

To study various endoscopic trans nasal transsphenoidal approaches and their outcome in surgical resection of pituitary macroadenoma, and to study the recovery and improvement in follow-up of patients operated for these tumors.

## **Materials and Methods**

All patients were assessed clinically for visual symptoms (acuity, field of vision, colour vision and fundoscopy), endocrine signs and symptoms, headache and others. Perimetry, hormonal assays and C.T. scan/MRI (brain and sellar region) were done in all cases preoperatively, and reassessed accordingly in postoperative and later, in follow up period. Immediate postoperative outcome (course), complications, postoperative radiotherapy or medical therapy results were assessed. All patients were followed up for various period of time from 3 months

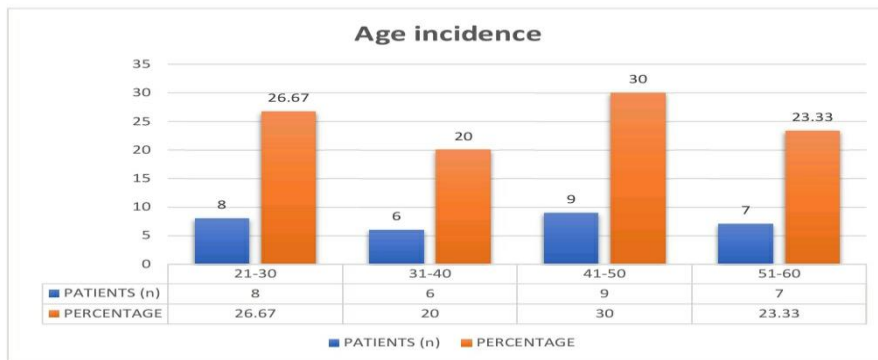
to 2 years on out patient department or by correspondence. Observations were compared with results and findings of various studies.

All patients with sellar&suprasellar pituitary tumors treated by transsphenoidal surgery were included in the study. Conservatively treated sellar&suprasellar lesions, cases operated by transcranial route. Sellar, parasellar or suprasellarmeningiomas, craniopharyngiomas or others were not included in the study.

**Results**

**Age incidence**

Youngest patient in our series was 21 years and oldest was 60 years. Maximum number of patients were between 41-50 years of age (30%), followed by 21-30 years (26.67%). in our series there was no patient above 60 years of age.

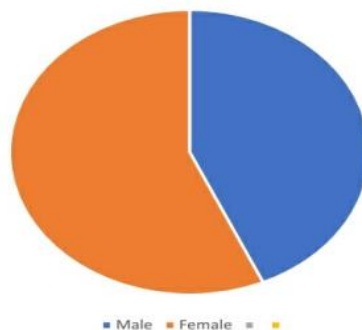


**Sex incidence**

Sex incidence shows female preponderance. in our series 56.67% were females, males contributing 43.33 .

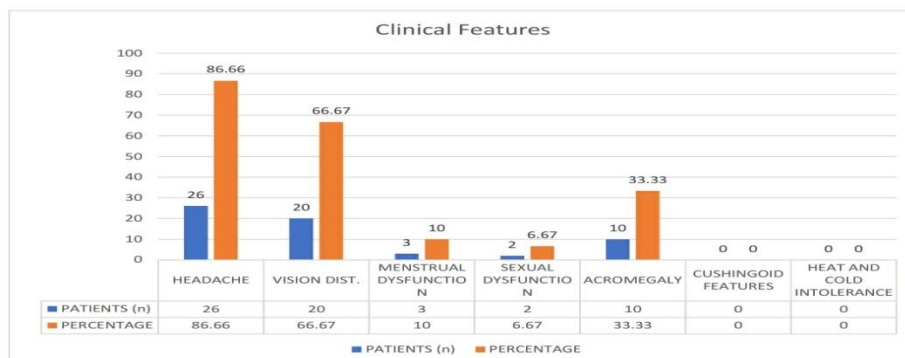
TABLE 2: SEX INCIDENCE

INCIDENCE



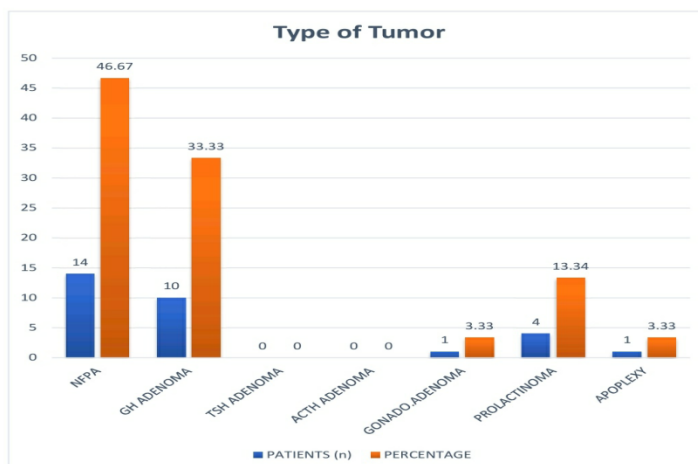
### Clinical features

Approx. 87% of the patients presented with symptom of Headache followed by Visual Disturbance (67%) and Acromegaly (33%).



### Incidence of different tumors

Non functioning pituitary adenomas are most common tumours in our series (46.67%) followed by GH adenomas (33.33%) and prolactinomas (13.34%).



### Pre-op neuroimaging (CT/MRI)

Sellar mass was found in all patients 30 (100%) with suprasellar extension in 17 patients (56.67%) with Parasellar extension in 04 (13.33%) patients .

	N	PERCENTAGE
SUPRASELLAR EXTENSION	17	56.57
PARASELLAR EXTENSION	04	13.33

### Hardy & Wilson Grade

In our series, most commonly encountered grades were 3A & 3B (36.67% & 26.67% respectively) followed by 4B (21%) and one patient each in 0,2A, 2B,2E & 4D.

GRADE		N	PERCENTAGE
0		1	3.33
1		0	0
II	A	1	3.33
	B	1	3.33
III	A	11	36.67
	B	8	26.67
	C	0	0
	D	0	0
	E	1	3.33
IV	A	0	0
	B	6	21
	C	0	0
	D	1	3.33
	E	0	0
TOTAL		30	100

### Extent of tumour resection

Total/near total removal was done in 27 patients (90%) and subtotal removal done in 3 patients (10%).

### Outcome and follow up

24 patients (80%) were discharge with total / near total removal. Adjuvant therapy was given in 6 patients, of which radiotherapy was given in 3 patients and medical treatment was given in 3 patients. All patients who had visual dysfunction preoperatively were assessed postoperatively in terms visual acuity and field of vision. 15 patients (50%) having improved visual function and it remained stationary in 15(50%) patients.

### Discussion

Most common age group to be affected by pituitary tumors falls between 41-50 years of age, similar age distribution pattern were seen in series by Minderman et al <sup>10</sup> . Male: female incidence of these tumors is 1: 1.3; similar sex incidence ratios shown in Kazumora et al <sup>11</sup>. Most common clinical symptoms in our series were Headaches followed by Visual disturbance. These symptoms of mass effect are much common than endocrinologic dysfunction of acromegaly and galactorrhea amenorrhea syndrome. Optic nerve involvement is other common clinical finding presenting in form of decreased vision or loss of vision, field defect or fundus changes. Commonest field defect is bitemporal hemianopia. Approximately half (47%) of the patients exhibited normal preoperative pituitary function in form of baseline hormone profile. Increased GH level (33%) followed by hyperprolactinemia (13%) are the most common endocrinologic abnormalities. MRI is the diagnostic investigation of choice in pituitary tumors to define extent, invasion and relationship to major vessels and nerves <sup>12</sup>. Total/near total removal was done in 27 patients (90%) and subtotal removal done in 3 patients(10%). Adjuvant therapies were given in 6 patients. Three patients were given radiotherapy and Three were given pharmacotherapy. The post operative

complications were CSF leak and Diabetes insipidus. Post operatively visual functions improved in 15 patients (50%) and it remained stationary in 15 (50%) patients, nearly similar to the findings of Salmi and Shone<sup>13-14</sup>. There was no incidence of worsening of visual function.

## Conclusion

The pituitary constitutes a unique class of neoplasia that in concept and in practice differs fundamentally from other tumors of intracranial origin. The diagnosis of these tumors is generally uncomplicated because of their unique clinical presentation involving visual apparatus and pituitary-hypothalamic axis. MRI is imaging procedure of choice in the evaluation of these tumors. Trans-Sphenoidal surgery is the primary treatment of choice for this class of tumors. The surgical objectives involve the elimination of mass effect, preservation and restoration of pituitary functions. Although gross total removal remains an intuitive and frequently achievable surgical goal for many tumors and should be attempted in the extent that it is safely possible it is neither a realistic expectation nor an absolute necessity. Preservation of function of pituitary stalk, optic apparatus and hypothalamus is essential in attaining desirable postoperative result. Subtotal resected tumors should be considered adjuvant therapy (Radiotherapy or Pharmacotherapy) on case-by-case basis. Careful follow up and optimization of pituitary hormone is important in long-term survival of the patients of pituitary tumors. The reduction of tumor size should be evident in 16 weeks of starting of the therapy, seldom does shrinkage occurs thereafter.

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