



Hormonal Remission Post TNTS Resection of Functional Pituitary Adenomas in a Tertiary Care Centre in South India - An Institutional Experience

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Abstract

Introduction: Pituitary adenomas are usually benign and present in two ways – either as an increase in the secretion of hormones or the tumor causing a mass effect on nearby structures. These presentations can include Acromegaly/gigantism, hyperprolactinemia, and Cushing's syndrome. Transsphenoidal surgery is the first-line treatment for most pituitary adenomas and this study attempts to highlight the extent of functional remission in patients operated on at St John's Hospital Bangalore for over one year.

Methodology: A retrospective review of patients' records who have undergone a trans-sphenoidal trans-nasal approach for pituitary tumors from April 2021 to April 2022 was performed. Hormone levels of functional pituitary adenomas were documented pre- and post-operatively to check for remission. All patients also underwent a CT or an MRI postoperatively to assess residual or recurrent disease and for those patients with hormonally active tumors, hormonal studies were also followed up.

Observations: A total of 28 transsphenoidal surgeries were performed during this study period. From a total of 27 pituitary adenomas, 10 (33.3%) were hormonally active, while 18 (66.5%) were non-functioning. The most common presenting complaint was visual field deficits, namely bitemporal hemianopia (76.2%) along with functional presentations like acromegaly (66.6%), Cushing's disease (22.2%), and hypothyroidism (18.9%). All cases were done under general anesthesia. The average length of hospital stay was 10 days. As is seen in the graphs provided, the post-operative measurements of functional parameters showed a significant drop when complete excision of the lesion was performed, with an average drop of 91% in growth hormone levels, 95.8% in cortisol levels, and 78% in TSH. The most common indication for longer hospitalization was diabetes insipidus which required extended monitoring and correction in liaison with the Endocrinology department.

Conclusion: The Transnasal-Transsphenoidal (TNTS) hypophysectomy approach represents the basic approach by which most pituitary adenomas are surgically resected. This report suggests and demonstrates that this procedure can result in improved rates of complete tumor removal, functional remission of hormonal parameters, and a reduced rate of complications.

Keywords: Hormonal Remission; TNTS; Pituitary Adenomas

Introduction

Pituitary adenomas comprise 16% of all primary cranial neoplasms. Although some incidentally discovered microadenomas that do not cause symptoms may be followed clinically and with repeated MRI, patients usually need medical or surgical intervention. Pituitary adenomas may present either with manifestation

suggestive of mass effect by the lesion or excess hormone secretion. The common syndromes include Cushing's disease, acromegaly/gigantism, and hyperprolactinemia. The goals of treatment would include

- Improved quality of life and survival
- Elimination of mass effect and reversal of symptoms

- Normalization of hormonal hypersecretion
- Recovery of normal pituitary function
- Prevention of recurrence of the pituitary tumor.

Trans-sphenoidal surgery is the first-line treatment for most pituitary adenomas.

Objective

This study attempts to highlight the extent of functional remission in patients operated at St John’s Hospital Bangalore for over one year.

Methodology

- Preoperative: An initial assessment was performed on all patients including an MRI or CT to image the lesion. They also underwent an endocrine assessment, and hormone excess or deficiency was established based on published guidelines. An ophthalmological consult was also sought for visual acu-

ity and perimetry assessment. A decision was then taken to opt for a total resection or a debulking only and a thorough discussion with the patient was done to set expectations.

- Intraoperative: All surgical procedures were performed by 2 neurosurgeons who used the “3-hand technique,” in which one neurosurgeon handled the instruments while the other held the endoscope.
- Postoperative: All patients were closely monitored for complications in the postoperative ward. Routine follow-up entailed a visit to the outpatient clinic 4-5 weeks after surgery. Full hormonal panels were repeated for an assessment of pituitary function. An MRI was done at 6 months to check for tumor remnants and to assess regrowth. Endocrinological remission was defined as postoperative GH/Cortisol/TSH or prolactin levels at or below the age- and sex-normalized values.

Result

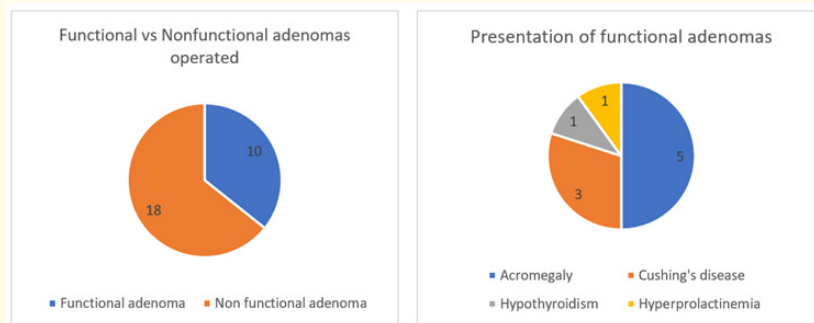


Figure a

Over one year, 28 cases of pituitary adenoma were operated upon, out of which 10 were diagnosed to be functional. Among the functional pituitary adenomas, 5 presented with acromegaly, 2 with Cushing’s disease, 1 with hypothyroidism, and 1 with hyperprolactinemia.

Remission was achieved in 8 of 10 operations (80%).

Among patients with acromegaly, we achieved functional remission in 80% of operations (4/5 operations). In one patient, post-

operative values remained in the same range as complete tumor resection was not achieved. This was because of intra-operative findings of adherence to the internal carotid artery.

Among patients with Cushing’s disease, remission was achieved in 66.7% of surgeries (2/3).

In prolactinomas, remission was achieved in 100% of surgeries (1/1).

Patient demographics and preoperative characteristics Demographic and Preop Characteristics	Value
Sex	
Male	6
Female	22
Mean age, in years	43
Clinical symptoms and signs	
Facial changes	5
Increased ring/feet size	5
Headache	23
Prognathism	5
Frontal bossing	4
Visual acuity loss	15
Visual field cuts	10

Table a

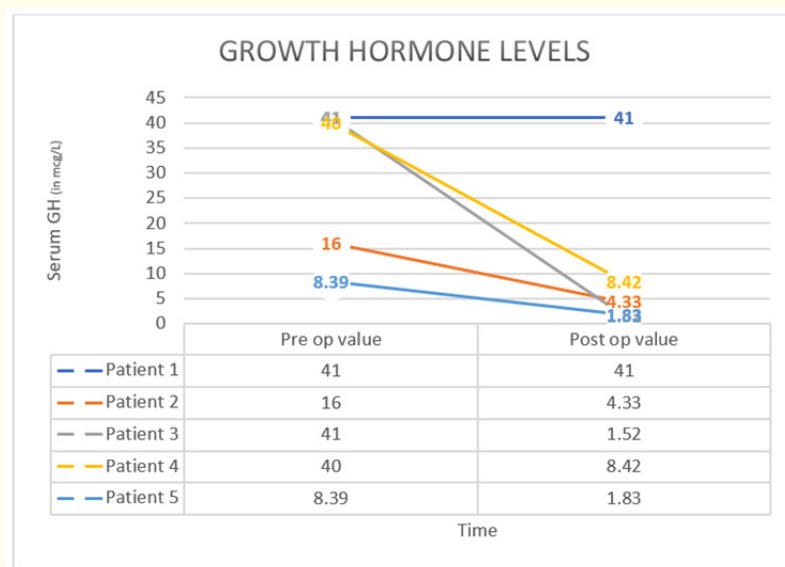


Figure b

Postoperative CSF leakage occurred in 2 patients, and none have complained of other complications like loss of vision, cranial nerve deficits, or vascular injuries. All patients are being followed up every 6 months and no recurrence has been reported until now.

Discussion

In this study, we analyzed the clinical and surgical outcomes of 28 patients with pituitary adenomas who underwent endoscopic

transsphenoidal resection of their tumors. The mean age of patients was 43 years, and the male/female ratio was 1:3.66. We have found that excision of the tumor has been sufficient in bringing patients into hormonal remission, as defined by age- and sex-normalized hormone levels, in 80% of all patients, this is more than a meta-analysis that described a functional remission rate of 73% following endoscopic transsphenoidal resection. Patients who underwent a TNTS resection experienced a low rate of postoperative complications.

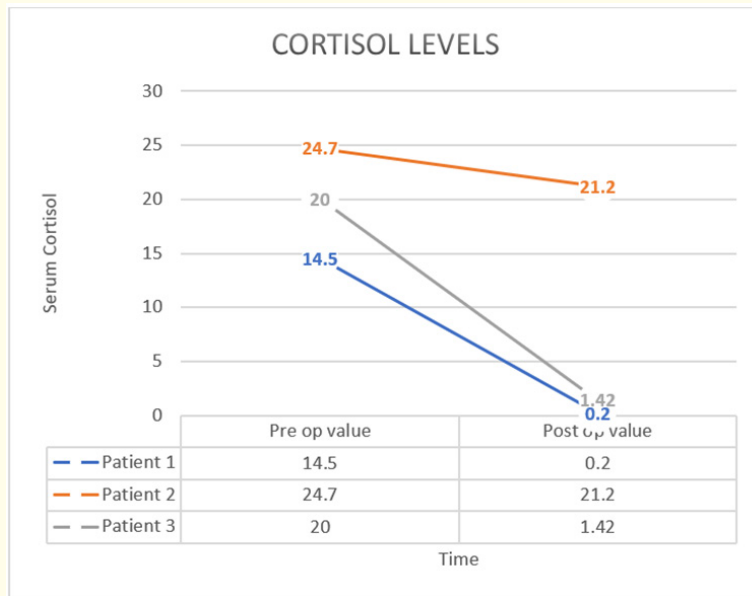


Figure c

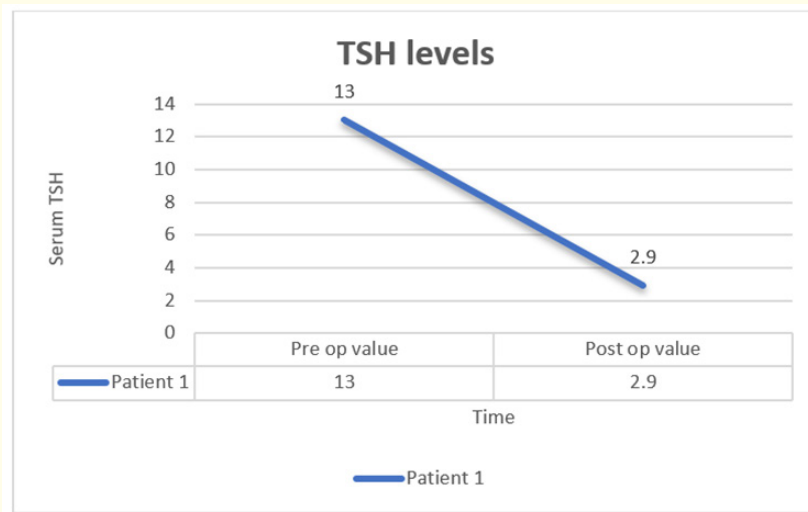


Figure d

Remission rates in our surgeries over the past year agree with recent meta-analyses (80% vs 59.8% for acromegaly, 66.8% vs 79.2% for Cushing’s disease, and 100% vs 67% for prolactinomas, with our results vs meta-analysis, respectively [1-5].

Conclusion

The Transnasal-Transsphenoidal (TNTS) hypophysectomy approach represents the basic approach by which most pituitary adenomas are surgically resected. This report suggests that this pro-

cedure can result in improved chances of complete tumor excision, functional remission of hormonal parameters, and a reduced incidence of complications. Challenges in this study would be related to criteria of cure and the need to standardize hormonal assays that define remission.

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