

INITIAL EXPERIENCE OF ENDOSCOPIC ENDONASAL TRANSPHENOIDAL SURGERY OF PITUITARY ADENOMAS

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Ключевые слова: аденома гипофиза, эндоскопический, трансфеноидальный, результаты

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Резюме: В статье представлены результаты хирургического лечения аденом гипофиза начинающим нейрохирургом. Оперировано 25 пациентов эндоскопическим трансназальным трансфеноидальным доступом. Цель исследования – изучить технику операции, процент тотального удаления опухоли, частоту послеоперационных осложнений, клинические результаты и критерии отбора пациентов.

Resume: This article is about an investigation conducted under the supervision of operating neurosurgeon to calculate the various aspects of the surgical intervention to clear the adenoma of hypophysis through transnasal transsphenoidal approach. Twenty five patients were operated. Our objective was to study the operational techniques, success rate, post operative complications, clinical outcomes and selection of patient.

Introduction

Pituitary adenomas make up 10 percent to 15 percent of all the accounted brain tumours. They are found in about 77 out of 100,000 people, although it is believed that they actually occur in as many as 20 percent of people at some point in their lives[8]. In the stereo tactical and advanced instrumentalised medical world endoscopic endonasal transphenoidal surgery(EETS) of adenoma of hypophysis has become one of the common problems in neurosurgery. The challenge lies in opting out this method for a particular patient. Moreover the amount of accuracy and approximation the neurosurgeon holds while operating the respective tumors make the hence named adenoma of hypophysis a challenging task for the modern neurosurgical world.[1,7]

Material and Methods

Twenty five patients were taken into consideration and were analysed through neurological examination, all the patients underwent for contrast-enhanced Magnetic resonance imaging (MRI) or Computed tomography (CT) depending on their previous medical status. The patients were tested for complete blood analysis, endocrinal profile and visual status. The diagnosis was confirmed by histological profiles post-operationally.

Results

Twenty five patients were considered for the EETS approach to clear the adenoma of hypophysis. The approach was binasal and with help of Rontgen controller (r-controller) 32%(8) and 68%(17) with frameless neuronavigation. Ages ranged from 24 to 55 years and 51 years being the average age. Out of these 12 were female and 13 were male. 24 of these patients were being operated for the first time and one was a revision case.

The cases of functional adenoma were 56%(14) out of which 78%(11) were



Table1. grouping of adenoma on basis hormonal activity

somatotropinoma and 32%(3) were prolactinoma and 44%(11) were non-functional.(Tab.1)

Visual defects:60%(15) of patients were having visual defect symptoms most affected with hemianopsia,and rest 40%(10) were not having such symptom.Postoperationthe visual status increased in all the patients with the mentioned problem.

Cavernous sinus invasion.According to Hardy's classification76%(19) patients were having grade III tumour while 24%(6) of them were in grade I.[4]

Surgical procedure.All the patients were operated only through transsphenoidal

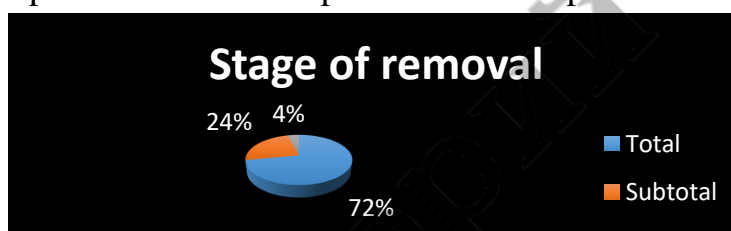


Table2.stages of tumour removal

approach and average time of operation being three hours.The average amount of blood loss was found to be 332 ml. In 72%(18) of cases the surgical procedure ended with total removal of the adenoma while in 24%(6) it was cleared subtotally,in one case i.e., 4% it was just for biopsy. (Tab.2)

Post operation all patients underwent a totalendocrine evaluation on the first postoperative day and a MRI scan within3 days after the surgery. The endocrine function was assessed inthe first,third,sixth month and each year after discharge.First MRI scan was advised time after sixth month for follow up.

Complications. Two patients had post operative leakage which was fixed conservatively using lumbar drainage. One patient had oculomotor palsy which disappeared spontaneously in a few days. One patient had transitory diabetes insipidus. Mortality rate was nil. Patients were discharged in 7-10 days.

Discussion:

Pituitary adenomas as mentioned one of the common brain tumours, slow growing tumours arising from cells of pituitary gland. The pituitary gland is located at the base of the brain, just behind the optic chiasma, so in many of the instances it's also noticed that these tumours impair the visual activity of the patient. [2,6]

Pituitary adenomas are classified into functional and non-functional on the basis of the serum markers of a respective hormones.

Surgery, radiotherapy and conservative treatment through medications are the ways of treatment for this problem. In surgery too there are variety of choices depending on the parameters and condition of the patient and the operating neurosurgeon. There open cranial approach, endoscopic transnasal transsphenoidal, and radio surgical intervention is also possible. [3]

Transnasal transsphenoidal approach is the most preferred type for neurosurgeons

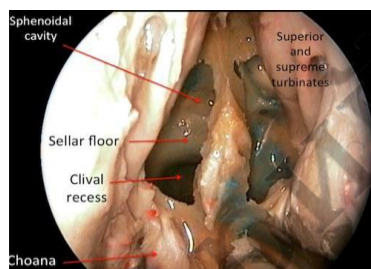


Figure 2.endoscopic anatomy of sphenoidal sinus

from the two decades based on the facts and publications. With advances in endoscopic techniques and instrumentation, and improved knowledge of the endoscopic anatomy, the endoscopic transsphenoidal approach has to be kept in mind as a safe and reliable minimal invasive surgical alternative for resection of intra-, supra- and parasellar lesions.

[10] EETS is indicated in sellar and suprasellar tumours. Staged or combined endoscopic trans-sphenoidal-transventricular approach for resection of a giant pituitary adenoma with ventricular extension can achieve a gross total removal. [8] Endoscopic endonasal transposition of the pituitary gland and its stalk can provide a valuable corridor

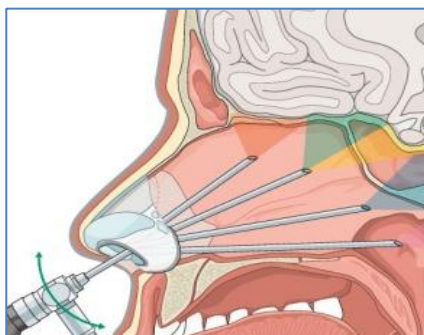


Figure 1.endoscopic transnasal approach

to the retroinfundibular tumour. Pituitary tumours with invasion in the internal carotid artery and cavernous sinus could be managed by EETS.[5] Recurrent and residual tumour,



Figure 3.drilling of sellarfloor

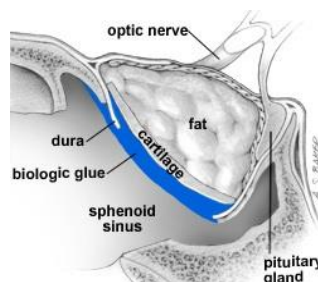


Figure 4.layered sealing of defect

and patients with pituitary apoplexy could be treated by EETS. [9]Biopsy of the tumour followed by radiotherapy could be suitable for Grade IV pituitary tumours. [1,2,3]

In the surgical procedure the instruments including 0, 30, 45 degrees, wide angle lens, 4-mm diameter rigid endoscopes, endoscope irrigation system, haemo-coagulators and bone biting instruments were used as a part of the procedure. The approach is preferably binal, one of the middle turbinate can be removed to gain more operative space (**fig.1**). In some cases it can even be uninasal and craniotomy is also performed in some rare cases with unsuitable position of the adenoma for the endoscopic approach. After the sphenoid sinus was opened, sellar dura was exposed fully according to the size location of the tumour (**fig. 2&3**).

All the microadenomas underwent extracapsular dissection while macroadenomas were resected piecemeal (intrasellar firstly, then suprasellar finally, explore the bilateral medial wall of cavernous sinus and remove the residual tumour invading into the cavernous sinus if possible). Repaired the sellar diaphragm intentionally if any defect was found. Finally the whole setup was fixed with a biological glue along with grafting material to prevent cerebrospinal fluid leak (**fig. 4**). Tamponade of the nasal cavity is not needed.

Conclusion:

The full endoscopic transsphenoidal surgery is a promising approach for pituitary adenoma resection. Multidisciplinary collaboration will lead to optimal cure for the patients. New technique and special-designed instruments can facilitate greatly this procedure. Radical surgery by a transsphenoidal route is indicated and possible in Grade I–III pituitary tumours. Such a strategy offers a reasonable opportunity for recovery in vision and a satisfactory postoperative and long-term outcome. Endoscopic endonasal transsphenoidal surgery is an effective treatment method for patients with large and giant pituitary adenomas, which results in high (>70%) rates of resection and improvement in visual function. It is not associated with high rates of major complications and is safe when performed by experienced surgeons.

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