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COMPLICATIONS OF TRANSSPHENOIDAL APPROACH FOR PITUITARY SURGERY

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Abstract:

This paper aims to study assessment complication Transsphenoidal pituitary surgery where 60 patients collected from different hospitals in Iraq, except for patients who underwent of the pituitary gland tumor.
By relying on the electronic record in the hospital to know the immediate complications after pituitary surgery, the patients were divided into three groups Non-functional, Apoplexy, and Macroadenoma patient
The main causes of early postoperative complications are hemorrhage in unremoved segments followed by the development of cerebral edema. Disruption of blood circulation in the hypothalamus with the development of hypopituitarism and the causes and nature of postoperative complications also depend on the severity of the patient's condition before surgery, the presence of concomitant diseases

Keywords: Macroadenoma, Non-functional, Transsphenoidal, pituitary tumor.

INTRODUCTION

assessing the problem of diagnosing and treating pituitary adenomas, it should be noted that the introduction of new diagnostic techniques, in particular the radioimmunoassay method for determining hormones in the blood, magnetic resonance imaging, and computer imaging, allows to diagnose tumors at the stage of micro-adenomas, to study in detail the topographic and anatomical features of the growth of large adenomas, based on the data obtained to determine the optimal amount of surgical intervention and appropriate target planning for potential postoperative effects[1,2,3,4]

According to a meta-analysis, mortality from transsphenoidal surgery is less than 0.5% [5,6,7]. The potential complications of pituitary gland surgery are varied. For the trans-sphenoidal approach, complications may be related to characteristics of the tumor, such as size and out-of-band extension, and others related to surgical manipulation of the pituitary gland, hypothalamus, and visual apparatus [12,13,14]. For the transcranial approach, complications generally relate to damage to the frontal lobe and optic nerve and, in uncommon cases, damage to the hypothalamus [8,9,10,11]. In the Philippines, Fonte et al. identified complications in the immediate postoperative period in patients who underwent pituitary surgery, namely transient diabetes insipidus, cerebrospinal fluid (CSF) leak, bleeding, transient deterioration in vision, and death [15,16].

The size of the pituitary adenoma is a factor of great importance for the effectiveness of surgical treatment. These tumors were arbitrarily divided into microscopic adenoma (<10 mm diameter) and large adenomas (>10 mm diameter).

At present, the risks caused by surgical treatment are minimal. Mortality <0.2% and appearance of cerebrospinal fluid leaks and/or meningitis occurs in approximately 1% of cases performed by experienced surgical groups

The incidence of hypofunction secondary to interference with any of the pituitary hormonal axes is about 1% in previous studies [17]

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MATERIAL AND METHOD

Patient sample

Sixty patients were collected from different hospitals in Iraq, except for patients who underwent of the pituitary gland tumor. The patients were distributed according to gender: 35 males and 15 females.

Study design

Information and demographic data for patients were collected from Al-Furat Hospital

We classified patients into three groups based on the histological type of tumor

There are many complications associated with the resection, including hypopituitarism, diabetes insipidus, cerebrospinal fluid leakage, residual gases inside the head, meningitis, damage to the visual system, double vision, hypoesthesia in the forehead or the infraorbital cheek, pseudo-aneurysm, or stroke. The operation on the ear, nose, and throat side may include nosebleeds, a weak sense of smell, and crusting of the nose and sinuses.

The patients were transferred to the hospital's intensive care unit, where complications related to this study were recorded within 48 hours

Most the benign pituitary adenomas form in the anterior lobe of the pituitary gland, and these tumors are classified according to their size and their effect on the production of additional hormones; based on their effect on the production of hormones, they are either functional or nonfunctional, and they can be stated according to the size as follows:

Macroadenomas), as the name indicates, this type of adenoma is large, as the dimensions of the tumor, in this case, exceed 1 centimeter, and due to the large size, these tumors can cause pressure on the nearby parts.

Microadenomas are small tumors less than 1 centimeter in size. The vast majority of benign pituitary adenomas are microscopic.

Study period

After obtaining the necessary approvals required for this study, the study period was to collect demographic information and data for a full year from 3-5-2020 to 4-9-2021.

Aim of research

This paper aims to study assessment complication Transsphenoidal pituitary surgery

RESULTS

Table 1- distribution of patient

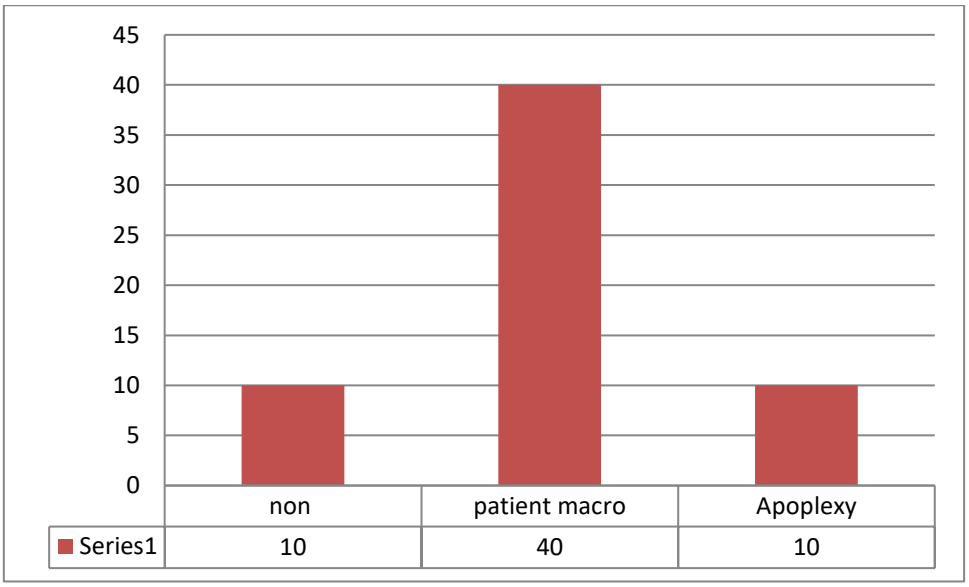

Table1- demographic results of patient

P	Non functional	Apoplexy	Macro patient
Age (y)	40.2±8.8	39.12±6.9	46.6±7.7

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BMI	26.4±4.3	25.5±43.9	27.1±3.3
Sex f (n)	3	2	12
Sex m (n)	7	8	28
Recurrent Tumor	-----	1	4
Hs (d)	3.6±2.5	5.2±1.1	5.7±1.7

Fig 2- p-value of demographic results between groups

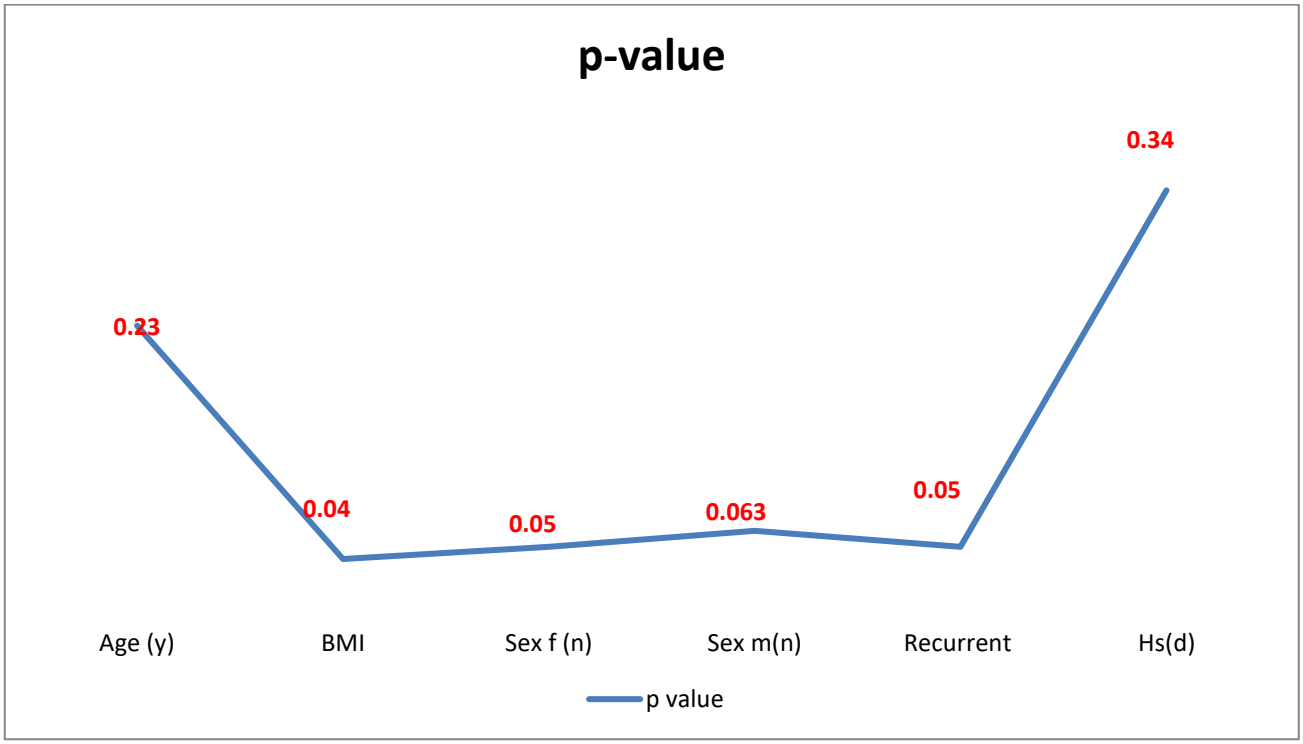

Table 2-hormone profile of patients

P	Non functional	Apoplexy	Macro patient	P value
T 3	140±40.4	90±30.3	110.3±20.9	0.045
T4	9.1±3.3	6.9±4.1	6.3±4.0	0.01

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Tsh	3.2±1.9	2.2±1.8	3.7±2.1	0.001
CORTISOL Range	0.6-45	0.8-60	0.3-8.9	0.018

Table 3- Disease-specific complications.

p	Non functional	Apoplexy	Macro patient
Diabetes Insipidus	2	2	20
CSF Leak	1	--	3
Hyponatremia	1	1	5
Sinusitis	1	2	2
Post-operative nausea and vomiting	2	1	3
Hypocortisolism and hypothyroidism	1	1	2
Intraventricular hemorrhage	1	2	2
Cerebral salt wasting	1	1	3

Table 4- p value of complication

Diabetes Insipidus	0.001
CSF Leak	0.063
Hyponatremia	0.45
Sinusitis	0.34
Post-operative nausea	0.45
and vomiting	0.32

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Hypocortisolism and	0.01
hypothyroidism	0.33
Intraventricular hemorrhage	0.022
Cerebral salt wasting	0.01

DISCUSSION

60 patients were collected from different hospitals in Iraq and divided into three groups: Non-functional, Apoplexy, and Macro patients Whereas; the Non-functional group included ten patients, and the mean s.d. to the age of the patients was 40.2 ± 8.8, and the Apoplexy group included ten patients and the mean s.d. to the age of the patients was 40.2 ± 8.8, and the Apoplexy group included ten patients with 39.12 ± 6.9, as for the group Macro patient mean s.d. to patients' ages was 46.6±7.7

The patients were distributed according to gender: 43 male patients and 17 female patients, as shown in Table 1.

A study of pituitary hormones was carried out in both peripheral blood and blood flowing directly from the pituitary gland. For this, catheterization was performed in the upper and lower cavernous sinuses. This procedure was also performed to determine the localization of the pituitary adenoma; for this purpose, computed tomography (CT) and magnetic resonance imaging (MRI) was performed.

The trans-septal approach to the pituitary gland in our modification ensures safety, rapid access, and good vision. In addition, the number of complications becomes minimal, but it should always be remembered that this approach is safe only for an experienced surgeon. The apparent ease of implementation in the absence of professionalism can lead to serious complications during the operation and in the postoperative period. Moreover, it must be remembered that although the experience of performing this operation is very beneficial in terms of preventing complications, data from the world literature indicate that problems arise in well-known surgeons.

Meningitis is a formidable complication with a fatal outcome, but, as a rule, it is not considered typical for operations of this type. However, it is performed through the nasal cavity. Among our patients, meningitis developed in patients, and with the use of extensive antibiotics, it is possible to prevent a fatal outcome. According to the literature, the incidence of post-operative meningitis in the pituitary gland ranges from 0.3 to 3%.

Sinusitis is a more common complication of transsphenoidal approaches than is generally believed. As a rule, this complication manifests itself in the late postoperative period. Therefore, N. Lervas does not classify it as a postoperative complication at all, but according to other surgeons, its recurrence rate is 1-15%. Among our patients, such a complication was observed in 1.6% of cases who were treated and monitored by an otolaryngologist.

CONCLUSION

The method of selective removal of pituitary Macroadenoma by intravenous access is the preferred method in the treatment of patients with hormonally active pituitary adenomas and patients with Macroadenoma; surgical treatment is indicated in the absence of the effect of bromocriptine therapy.

It is one of the most frequent complications of diabetes insipidus in patients with the pituitary gland and hypothalamus

RECOMMENDATION

1. It is used for prolactinomas. This method of treatment allows you to control up to 90% of all prolactinomas. There are drugs that are used to treat other adenomas, but they are appointed individually in each case by a board of several specialists.
2. Contraindications to operations are irreparable problems to the cardiovascular system and other internal organs that require correction

REFERENCES

1. Jane JA, Sulton LD, Laws ER (2005) Surgery for primary brain tumors in US academic training centers: results from the residency review committee for neurological surgery. J Neurosurg 103 (5): 789-793.
2. Wilson CB (1992) Endocrine innactive Pituitary Adenomas. Clin Neurosurgery 38: 10-31.
3. Liu JK, Weiss MH, Couldwell WT (2003) Surgical approaches to pituitary tumors. Neurosurg Clin N Am 14 (1): 93-107.
4. Cushing H (2010) Surgical experiences with pituitary disorders. JAMA 63: 1515-1525.

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5. Dott NM, Bailey P (1925) A consideration of the hypophysial adenomata. Br J Surg 13 (50): 314-366.
6. Guiot G, Arfel G, Brion S (1912) Adénomes hypophysaires. Masson Paris p. 276.
7. Griffith HB, Veerapen RA (1987) A direct transnasal approach to the sphenoid sinus technical note. J Neurosurg 66 (1): 140-142.
8. Manninen PH, Raman SK, Boyle K, Beheiry H (2018) Early postoperative complications following neurosurgical procedures. Can J Anesth 46 (1):7-14.
9. Tumul C, Hemanshu P, Parmod K. Bithal, Bernhard S (2014) Immediate postoperative complications in transsphenoidal pituitary surgery: A prospective study. Saudi J Anaesth 8 (3): 335-341.
10. Han ZL, He DS, Mao ZG, Wang HJ (2008) Cerebrospinal fluid rhinorrhea following trans-sphenoidal pituitary macroadenoma surgery: experience from 592 patients. Clin Neurol Neurosurg 110 (6): 570-579.
11. Shiley SG, Limonadi F, Delashaw JB, Barnwell SL, Andersen PE, et al. (2003) Incidence, etiology, and management of cerebrospinal fluid leaks following trans-sphenoidal surgery. Laryngoscope 113 (8): 1283-1288.
12. Sane T, Rantakan K, Poranen A, Tabtela R, Valimali M, Pelkonen R: Hyponatremia after transsphenoidal surgeon for pituitary tumors. J Clin Endocrinol Metab 1994;79: 1395-8.
13. Kristof RA, Rother M, Neuloh G, Klingmüller D. Incidence, clinical manifestations, and course of water and electrolyte metabolism disturbances following transsphenoidal pituitary adenoma surgery: A prospective observational study. J Neurosurg 2009; 11:555-62.
14. Taylor WA, Thomas NW, Wellings JA, Bell BA. Timing of postoperative intracranial hematoma development and implications for the best use of neurosurgical intensive care. J Neurosurg 1995; 82:48-50.
15. Atkin SL, Coady AM, White MC, Mathew B. Hyponatremia secondary to cerebral salt wasting syndrome following routine pituitary surgery. Eur J Endocrinol 1996; 135:245-7.
16. Ciric I, Ragin A, Baumgartner C, Pierce D. Complications of transsphenoidal surgery: Review of a national survey, reviewof the literature, and personal experience. Neurosurgery 1997; 40:225-36.
17. Patil CG, Lad SP, Harsh GR, Laws ER Jr, Boakye M. National trends, complications, and outcomes following transsphenoidal surgery for Cushing's disease from 1993 to 2002. Neurosurg Focus 2007;23:E7.