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REVIEW ARTICLE

Cranial Nerves Palsy in Pituitary Apoplexy Outcome Post Emergent Surgery

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Abstract:

Introduction:
pituitary apoplexy (PA), an uncommon clinical condition brought on by rapid bleeding or infarction. The primary symptom, a sudden, severe headache, is occasionally accompanied by vision abnormalities or ocular palsy.

Aim of the study :
to assess the benefit of an emergent trans sphenoidal approach and its results, as well as the deficit of cranial nerves other than the optic nerve in the recovery from pituitary apoplexy.

Patient and methods
A prospective study of cranial nerve deficit in pituitary apoplexy and their prognosis in patients with apoplexy followed up on 16 patients from 2018 to 2020 who had cranial nerve deficits throughout their hospital stays and for up to two years following release.

Results :
Oculomotor nerve intracavernous segment has more predilection to involve in pituitary apoplexy cavernous invasion in our study we include other cranial nerves to expel the presenting oculomotor nerve palsy in comprise to other cranial nerves and even with mixed cranial nerve involvement, the cranial nerve involvement and cavernous extension and the volume of tumor effect additional compression on cranial nerve. Only one patient with 3rd cranial nerve palsy and one patient with mixed palsy is not recovered after six-month postoperative fellows while the majority retrieve their function during 1st three months.

Conclusion:
Patients with pituitary apoplexy who experienced ocular motility dysfunction due to cranial nerve palsies had favorable prognoses.

Keywords: Pituitary apoplexy, cranial nerve palsy, pituitary adenoma.

Introduction:

Two to twelve percent of pituitary adenomas, particularly nonfunctioning tumors, are complicated by pituitary apoplexy (PA), an uncommon clinical condition brought on by rapid bleeding or infarction. The primary symptoms are a sudden severe headache is occasionally accompanied by vision abnormalities or ocular palsy. The condition may be complicated by meningeal inflammation or altered consciousness1. Third cranial nerve palsy that develops suddenly has been linked to the compromise of the nerve circulatory supply as a result of compression of the vasa nervorum that arises from the internal carotid artery2,3. These abrupt symptoms had been linked to PA 4. At around the same horizontal level as the pituitary gland, the third cranial nerve passes through the superior, lateral portion of the cavernous sinus5. The third cranial nerve is significantly more sensitive because of its position. The sella is frequently crossed by pituitary adenomas (PAs), and this tumor extension may be parasellar, infrasellar, or suprasellar6. In 10 to 40% of surgical instances, the PA parasellar extension into the cavernous sinus (CS) occurs. 7 8 9 10 11 It is debatable how the CS portion of PA is managed. Complications from surgical resection of a tumor in the CS are possible12 13, but they can be reduced by having a detailed understanding of the microsurgical anatomy of the CS and using endoscopic procedures. 14 15 16 17 Here, we discuss the endoscopic treatment of PAs that have extended into the CS, examine the frequency of CS extension, surgical risks, and long-term results, and suggest a treatment protocol.

The Aim of the Study

to assess the recovery of ocular motility dysfunction in patients with PA undergone endoscopic trans-sphenoidal surgery.

The Patients and Methods

A prospective case series study of cranial nerve deficit in PA and their prognosis in patients with apoplexy followed up on 16 patients from January 2018 to January 2020 who had cranial nerve deficits throughout their hospital stays and for up to two years follow-up release in the department of skull base surgery in the Medical City and Neurosurgery Teaching Hospital in Baghdad. The patients enrolled in the study included a pituitary adenoma as the source of PA and a Cranial nerve deficit as an apoplexy presenting sign.

The Exclusion Criteria

The study excluded the individuals with the following cases:

1. The patients who did not have a cranial nerve deficit and had an adenoma.
2. Other sellar or para sellar tumors may also result in cranial nerve deficits.

Each patient was evaluated clinically, and radiologically. Operation is complete through the endoscopic transsphenoidal approach.

Radiologic assessment at diagnosis, all the patients underwent an MRI scan unless it was contraindicated.

The Treatment Choice

The choice to perform surgery was determined by the treating surgeon depending on the patient's clinical condition. The patients who came with an acute decline in their visual status and/or level of awareness were often candidates for surgery. Surgical direction by endoscopic trans-sphenoidal technique was used to remove tumors from each patient in the surgical group. PA patients in 16 cases were based on the involvement of the third cranial nerve and how it relates to the involvement of the other cranial nerves. 4th. 6th, mixed cranial nerve palsy and radiological extension to CS were suggestive of pituitary apoplexy. Clinical information, such as the tumor size, if it has spread to the CS, the symptoms present at diagnosis, and the cranial nerves implicated, all are documented during initial assessment and postoperative follow-up. The present study main focus was on cranial nerve function specifically.

The Results

The number of patients was sixteen, seven of them were females and nine were males.

The oculomotor nerve intracavernous segment had more predilection to be involved in PA cavernous invasion Table one shows the volume of tumor cranial nerve involved, knosps classification, and radiological extension.

Table 1 nerve deficit and radiological extension

case	cranial nerve	Knops*	radiological extension
1	3rd	3b	Superior- lateral
2	3rd	3b	Superior- lateral
3	3rd	4	Superior- lateral
4	3rd	4	Superior- lateral
5	3rd	3a	Superior- lateral
6	mixed	4	Lateral
7	3rd	3a	Superior- lateral
8	6th	2	Posterior-lateral with clival invasion
9	3rd	3b	Superior- lateral
10	mixed	4	Lateral
11	6th	2	posterior lateral with clival invasion
12	mixed	4	Lateral
13	3rd	3a	Superior- lateral
14	mixed	3b	Lateral
15	3rd	3a	Superior- lateral
16	mixed	3b	Lateral

*Classification of Knosp grading the cavernous sinus extension when compared to lines drawn medial through the middle and on the lateral aspect of the carotid arteries grade 0 to 3. Grade 4 encases the carotid.

The recovery of nerve deficit postoperative monitor for six months follow-up is illustrated in Table 2.

Table 2 recovery period

Recovery period	3rd	6th	Mixed
1 week – 1 month	4	1	2
1 month – 3 months	3	1	1
3 months – 6 months	1	-	1
Not Recovered	1	-	1
Total	9	2	5

Only one patient with 3rd cranial nerve palsy and one patient with mixed palsy did not recover after six months postoperative fellows while the majority retrieved their function during the first three months.

The Discussion

Neuro-ophthalmic symptoms and signs are frequently present during PA. In this prospective case series of PA patients, various retrospective case studies of PA patients in the neurosurgical literature reported on ocular motility dysfunction (OMD). According to various earlier findings, CN III and CN VI were the most frequent OMDs in the present series. 3,13,16,9,17, and 20; nonetheless, some series have noted CN VI involvement occurring more frequently than CN III involvement. Our propensity for 3rd cranial nerve involvement can be explained by compression outside the sinus, according to 7, 10, and 12 studies. According to findings by Kobayashi et AL, erosion of the posterior clinoid process caused a mass to press against the third cranial nerve at the level of the trigone 18. CS involvement at Dorello›s canal level explains 6th nerve palsy 19. There is only one known instance of solitary 4th nerve palsy despite the therapy of PA patients with OMD and no vision loss being very contentious. Indeed, following delayed surgery and even with conservative care, several studies demonstrated improvement. 19,20 and Rajasakeran et al. 2010 attained the further conclusion that conservative management alone results in OMD resolution often within days or weeks based mostly on descriptive case series. Conversely, Verrees et al21 When Jho et al22 presented a classification of PA syndromes from 1 (asymptomatic) to 5 (all the patients with vision loss), with higher grades indicating a need for more urgent/timely surgical care, they also pushed for early surgery in patients with OMD and no visual loss and supported early surgery.

The Conclusion

The patients with PA who experienced ocular motility dysfunction due to cranial nerve palsies and were managed surgically had favorable prognoses and were more frequently linked with specific radiologic characteristics.

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