Complete 3rd cranial nerve dysfunction post-deflation/excision of an encasing pituitary macroadenoma intrasellular cyst: A Case Report

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Abstract: Central nervous system injury in particular cranial nerve palsy has been reported to be as high as 2%. Such prevalence of palsy generally attributed to surgical manipulation at the cavernous sinus, especially incurring the abducens nerve. We report the first case of acute oculomotor nerve sequel to the release of cystic fluid wrapping the nerve following a transsphenoidal excision of pituitary macroadenoma in a 57-year-old woman. She attended with the presentation of acute excruciating headache associated with partial drooping of right eye. The computed tomography and magnetic resonance imaging (MRI) were consistent with pituitary apoplexy of an underlying pituitary macroadenoma. Urgent transsphenoidal hypophysectomy was done. Intra-operatively, cystic fluid was aspirated during pituitary tumour dissection. At the same time, curettage was employed to removal residual tumour after the tumour biopsy. Immediate post-operative assessment noted complete right eye ptosis, with clinical evidence of complete right third and fourth nerve palsies. MRI was repeated a week later in view of such palsy non-resolution. However, no local compression or edema noted. Observation and monitoring were opted versus surgical revision. Propitiously the aforementioned cranial nerve palsies persist for a month and subsequently subsided. In this case, we highlight the potential deleterious impact of aspirating cystic component and curettaging during pituitary surgery. Likely postulated accounts for such occurrence include sudden release of fluid pressure with resultant cystic traction on its enfolding cranial nerves and subsequent neuropraxia. We aim to invite comments that could enlighten us on this gray area.

Key words: pituitary tumour, cranial nerve palsy, intraoperative cyst aspiration

Introduction

Pituitary macroadenoma could often lead to apoplexy requiring emergency operative intervention, i.e. transsphenoidal. Transsphenoidal hypophysectomy has attained wide popularity ensuing 1962, with the debut of operative microscope (1). Reported sequelae from such approach include carotid artery injury, meningitis, haemorrhage, CNS injury, CSF leak, nasal septal perforation, endocrine complications of diabetes insipidus and anterior pituitary

insufficiency, and even death. The risks, however, depend on surgeon's experience, ranging from 0.4 % to 20 %. Of these, vision loss and ophthalmoplegia are common cranial nerve dysfunction, with the peril of 0.4 to 2.4 % (2). These have been directly related to inevitable intrasellar attempt to reach the pituitary tumour from medial cavernous sinus (2). Nonetheless, cyst breakdown with consequent third nerve palsy has yet to be reported.

Case Illustration

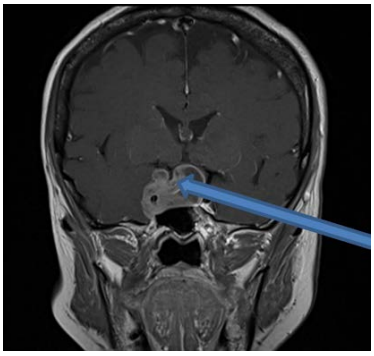
A 57 years old woman with underlying dyslipidemia, came as outpatient with affliction of intermittent episodic headache of 2-year duration. Nevertheless, the headache became worse and generalized over the past five months, with associated left upper eye visual disturbance. Few CT brain imaging examinations in several private centers during this period of time were told to be unremarkable. She was then seen by an ophthalmologist who arranged for an MRI brain, which showed pituitary macroadenoma, and referred her to our center: Figure 1.

Elective admission for transsphenoidal hypophysectomy was ordered by neurosurgeon.

However, 10 days prior to admission, she developed severe right sided headache but no evidence of apoplexy based on CT brain ordered via neurosurgeon. Following that, a day prior to admission she complained of partial drooping of right eye. Clinical examination revealed a right partial ptosis with the rest of cranial nerves remained intact. Repeat CT brain confirmed clinical diagnosis of pituitary apoplexy and she was rushed by neurosurgeon for an urgent transsphenoidal hypophysectomy. Pituitary mass was noted to be identified with Brain Lab IGS system. Sphenoid was noted to be seen and excised. Bilateral optic and carotid indentation as well as sella were found to be recognized. Cystic component of soft gelatinous tumour was aspirated during tumour dissection. The remaining pituitary tumour was curettaged out. The tumour was removed from posterior, lateral and anterior, without involving medial aspect. The operation lasted 3 hours without intra-operative sequelae. Histopathological examination of brain tissue (excluding cystic component) showed pituitary adenoma.

Notwithstanding, immediately after the surgery, she complained of complete right eye ptosis, with clinical evidence of complete right third and fourth nerve palsies. MRI brain was repeated a week later in view of such palsy non-resolution. However, no local compression or edema noted.

Observation and monitoring were opted versus surgical revision/decompression. The cranial nerve palsy resolved completely after one month during follow-up.



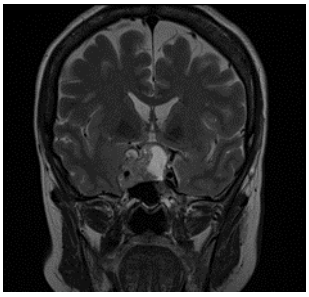
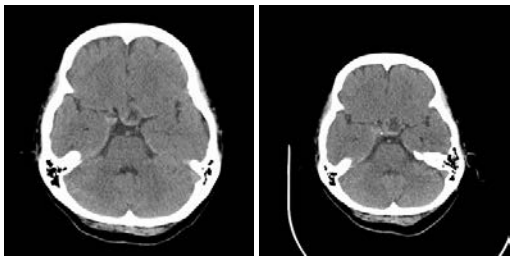
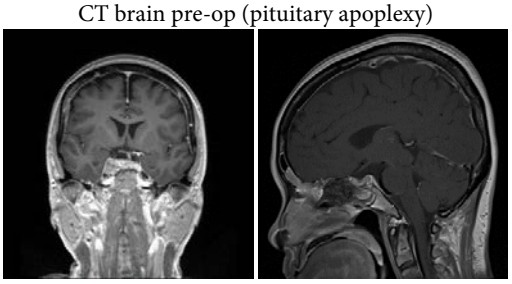


Figure 1 - MRI brain
Cystic component of the pituitary tumour wrapping the cranial nerves/cavernous sinus

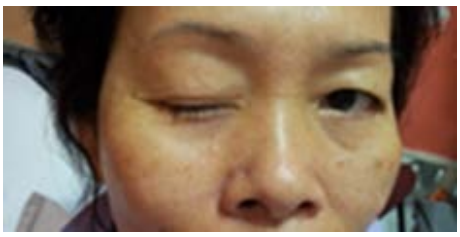


CT brain pre-op (pituitary apoplexy)



MRI Brain one week post-op (residual pituitary lesion at right cavernous sinus, no massive local compression or edema noted)

Figure 2 - pre- and post-op



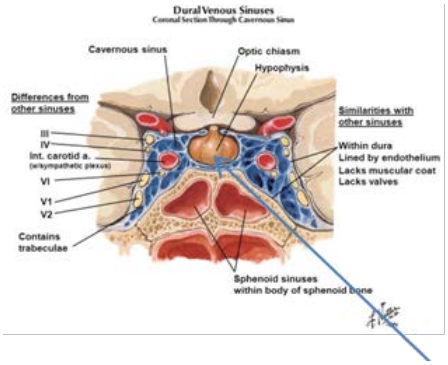
Complete Right Eye Ptosis

Post-op: lack of right eye's medial gaze, with right eye in "up and out" position, indicating both oculomotor and trochlear nerves palsy

Figure 3

Discussion

Visual dysfunction and CNS impairment have been recognized as part of complications from pituitary surgery (2). Usually it is related to tracing the pituitary tumour that is located medial to the cavernous sinus (2) whereby all the vital structures of cranial nerves situated. However, cases of cranial dysfunction related to intraoperative cyst aspiration have not been reported. In contrary, it has been advocated back in 1987, that transspenoidal cyst puncture was a routine therapeutic measure for symptomatic expanding cyst (3). In this patient, the excision did not involve the medial aspect. Cyst enclosing the oculomotor nerve's area was indeed aspirated.



Adapted from Netter's Atlas of Human Anatomy

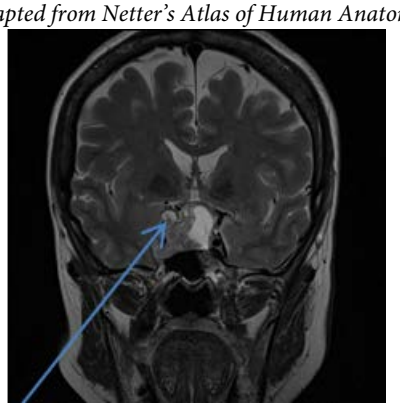


Figure 4 - Diagramatic and imaging representations of pituitary cyst in proximity to cranial nerves III and IV

The removal of the cystic fluid could have resulted in traction along with the cyst the underlying vital cranial nerves that it has wrapped upon. This has led to the clinical apparent third and fourth cranial nerve palsy immediately post-op. Furthermore, concurrent curettage of the tumour could have compounded the nerve dysfunction by creating transient local tissue edema and pressure. Mutually, perhaps this case did not involve scar tissue with resultant axonal compromise, in which case the symptoms will begin rather later (3-4 days from onset).

The resulting neuropraxia could have explained the speedy recovery of this case. Thus, observation will be sufficient in this case. Otherwise, if axonotmesis or even neurotmesis is to happen, the potential outcome will be dismal. This case illustrated perhaps practice of cystic aspiration should be revised. Or at least, to formulate an effective preventive and immediate surgical approach should severe cranial nerve dysfunction arise from such puncture.

Conclusion

Again this case underscores the importance of understanding the clinical neuro-anatomy and the potential harm of aspirating cyst intraoperatively. Such outcome needs to be foreseen and addressed ahead prior and during the operative intervention.

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