

Optic Tract Edema: A Rare Entity in Pituitary Macroadenoma

Abstract

Pituitary tumors are relatively common tumors accounting for almost 15% of all primary brain tumors. Pituitary macroadenomas cause mass effect on the optic apparatus causing a myriad of visual deficits. On imaging generally the anterior visual pathway is involved which may be compressed by the mass lesion. Edema in the posterior visual pathway, i.e., optic tracts on magnetic resonance imaging is a relatively common finding in craniopharyngiomas and other metastatic lesions in the pituitary region. Edema in the optic tracts in pituitary macroadenomas is a very rare entity as reported by various authors in literature. We report a case of optic tract edema in a case of pituitary macroadenoma which caused rapid deterioration in the vision of the patient and improved after administration of steroids.

Keywords: Craniopharyngioma, optic tract edema, pituitary macroadenoma

Introduction

Pituitary macroadenoma is a relatively common tumour of the central nervous system (CNS) accounting for almost 15% of all primary brain tumors and almost 25% of benign primary brain tumors.^[1] The clinical presentation of these tumors vary depending on the functional status of the tumors, features of hypopituitarism if the pituitary gland is involved or compressed by the tumor and myriad of visual field defects/visual acuity disturbances depending on the size of the tumor or degree of involvement of the visual apparatus.^[2] Almost exclusively, the anterior visual pathway is involved by pituitary tumors due to varying degrees of mass effect or compression of the anterior visual pathway.^[2] Edema of the optic tract due to pituitary macroadenoma is a very rare finding on magnetic resonance imaging (MRI) compared to craniopharyngiomas. We describe a case of pituitary macroadenoma which was associated with bilateral optic tract edema as demonstrated on MRI.

Case Report

A 74-year-old female known case of Type II diabetes mellitus, primary hypertension and deep venous thrombosis (DVT) of the left leg on tablet warfarin, was admitted

to our hospital for the evaluation of upper gastrointestinal bleed. The patient had no complaints of any visual problems before this admission and had complaints of mild global headache on and off for the past 4–5 months. There was no history of sudden worsening of her headache associated with visual deterioration in the past. After 5 days of admission to the hospital, the patient complaints of rapidly worsening eyesight which was not associated with any change in the character of her headache.

Clinical and neurological evaluation revealed visual acuity of perception of hand movement in the left eye at 3 feet distance and only perception of light in the right eye. Pupils were bilaterally 04 mm and reacting to light. Rest of the systemic and neurological examination was unremarkable. Perimetry for visual field defects could not performed due to the poor visual acuity of the patient. The visual evoked potential was not recordable. Endocrinological evaluation did not reveal any hormonal disturbances.

Multiphase contrast enhanced MRI revealed approximately 30 mm × 25 mm × 24 mm mass lesion in the sellar and suprasellar region. This mass lesion was seen to displace the optic chiasm superiorly, and pituitary could not be separately visualized from the lesion [Figure 1]. There was no evidence of apoplexy on the MRI. Axial fluid-attenuated inversion recovery sequence

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Figure 1: T1 sagittal postcontrast image showing the pituitary macroadenoma (marked by the arrow)



Figure 2: Axial fluid-attenuated inversion recovery image showing the edema of the optic tract bilaterally (marked by the arrows)

revealed bilateral optic tract edema (right > left) [Figure 2]. No other abnormalities were noted on MRI.

In view of the rapid deterioration of the vision and MRI findings of bilateral optic tract edema, injection dexamethasone 4 mg IV QID was started for the patient and the patient was planned for trans nasal transsphenoidal excision of the tumor. Since the patient had deranged international normalized ratio (2.10), she could not be taken up for surgery immediately which carried a high risk of bleeding in the intra- and post-operative period. After 3 days of administration of injection dexamethasone, the patient had improvement in her vision. The patient was not willing for any surgical intervention because of her age, comorbidities, and significant risk of bleeding in her case because of the medications for DVT. She has been kept on follow-up for visual complaints.

Discussion

Pituitary tumors are relatively common tumors of CNS, and their incidence reported in literature is 15% of all primary brain tumors.^[3] One of the modes of presentation of these tumors is a combination of various types of visual defects as characterized in the detailed ophthalmologic evaluation. These visual deficits are produced by pituitary macroadenomas by causing various degrees of compression on the anterior visual apparatus mainly the optic chiasma. The visual loss also occurs due to long-standing compression on the optic nerve leading to its atrophy which is indirectly demonstrated on fundus examination by optic disc pallor. MRI of the visual apparatus in pituitary macroadenoma reveals various degrees of compression and splaying of the optic chiasma over the tumour which is the cause of visual deficits in these patients.

However, very rarely do we have findings in the posterior optic apparatus on imaging in patients with pituitary adenomas. Optic tract edema as visualized on MRI is more commonly associated with craniopharyngioma rather

than pituitary macroadenoma. In the study published by Nagahata *et al.*^[4] optic tract edema was detected in five of the eight patients with craniopharyngioma, whereas none of the patients with pituitary macroadenoma ($n = 15$) or tuberculoma sellae meningiomas ($n = 06$) revealed optic tract edema on MRI. More recently Hirunpat *et al.*^[3] in their article found optic tract edema in 7 of 11 patients with craniopharyngiomas whereas no optic tract edema was seen in 28 pituitary macroadenomas, 4 meningiomas, and similar other rarer pathologies of sellar/suprasellar regions (hypothalamic hamartoma, germinoma, astrocytoma, and arachnoid cyst).

Optic tract edema in patients has been demonstrated on MRI in the study by Saeki *et al.*^[5] in which 4 out of 25 pituitary adenomas had these findings whereas 8 of 11 craniopharyngiomas had optic tract edema. However, there was no clinical correlation between optic tract edema and degree of visual abnormalities detected in this study.

Our patient did not have any visual complaints to start with but developed visual complaints in a short period without any features of apoplexy. MRI showed bilateral optic tract edema which could be the cause of her rapid deterioration of vision. Improvement noticed in her vision after administration of steroids further substantiates our theory.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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