Eye (2003) 17, 1032–1042

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Sir,

Orbital invasion by a pituitary macroadenoma without visual loss: case report and review of the literature

Eye (2003) **17,** 1032–1034. doi:10.1038/sj.eye.6700481

Pituitary macroadenomas (ie tumour >5 mm) can extend in either lateral, superior, posterior, inferior, or more seldom anterior directions, thus invading the orbital cavity through the optic foramen and/or the superior orbital fissure. Orbital invasion by pituitary adenoma has been previously described, but is a rare growth pattern of this tumour.[1–11] Visual loss is a frequent symptom of orbital extension of a pituitary macroadenoma, other signs and symptoms including diplopia, orbital pain, and exophthalmos. Therapeutic options include surgical removal or irradiation of the tumour, but visual outcome is usually poor, and

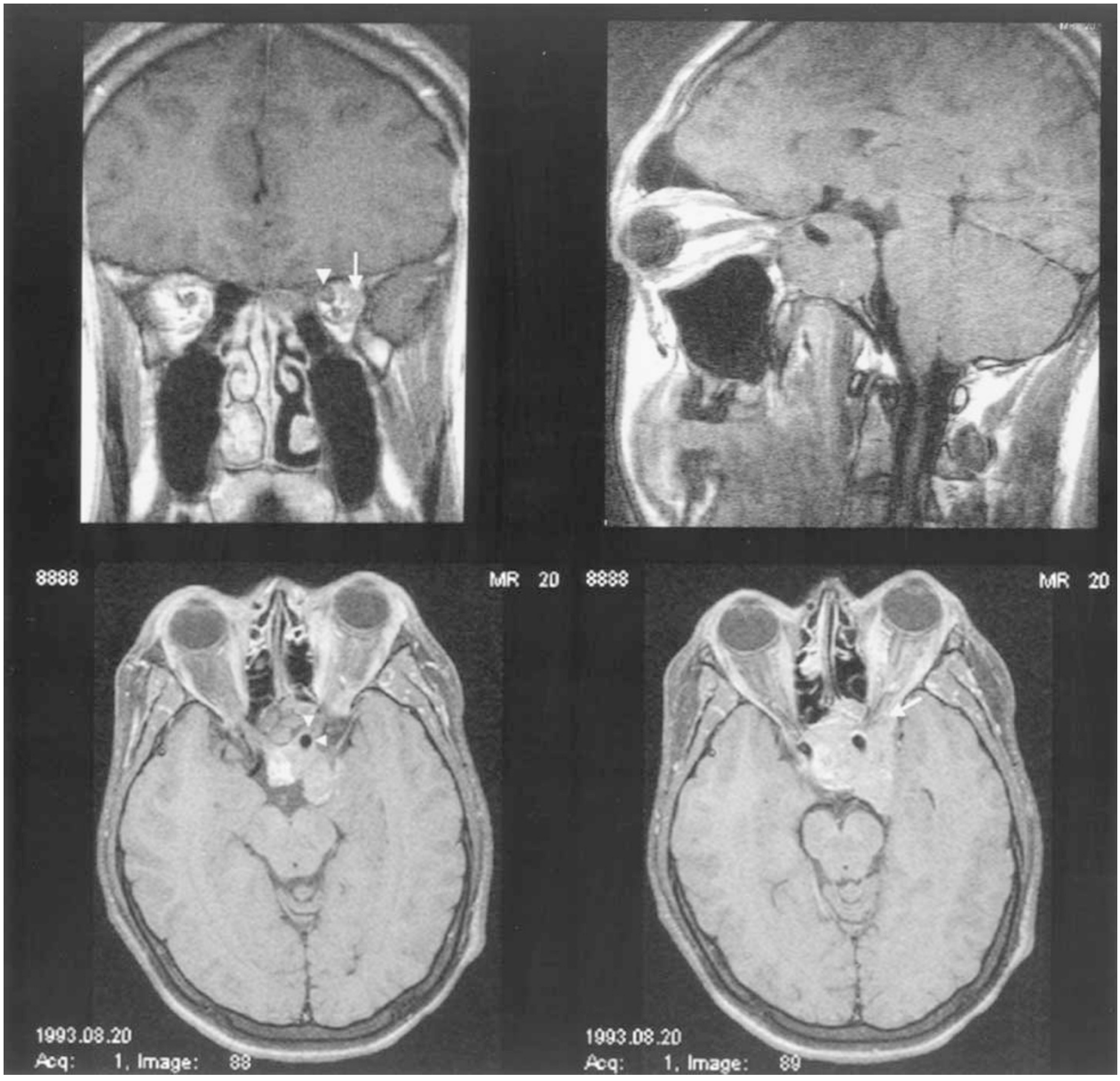

Figure 1 Top left—MRI, T1-weighted image after gadolinium injection. Coronal section through the orbital apex showing lateral tumour invasion (arrow) at a distance from the optic nerve (arrow head). Top right—MRI, T1-weighted image. Sagittal section showing the left carotid artery surrounded by the tumour. Bottom left—MRI, T1-weighted image with fat suppression and gadolinium injection. Axial section showing the tumour surrounding the left internal carotid artery, but stopping at the entrance of the optic foramen (arrowheads). Bottom right—MRI, T1-weighted image with fat suppression and gadolinium injection. Axial section showing the tumour invading the left orbit through the superior orbital fissure (arrow).

final visual acuity is frequently no better than finger counting.

We report a case of pituitary tumour invading the orbit, presenting with progressive exophthalmos and, later, fluctuating diplopia but without visual loss.

Case report

In February 1993, a previously healthy 30-year-old man complained of a left bulging eye for the past 4 years associated with a more recent onset of left parietal headache and left periocular pain. Examination revealed 4 mm of left proptosis but otherwise was normal. Thyroid-associated orbitopathy (TAO) was suspected, but results from orbital computerized tomography and blood studies (T3, T4, TSH) were normal.

In April 1993, fluctuating vertical diplopia was present in upgaze. Examination revealed normal visual acuity (6/5), colour vision (17/17 by Ishihara plates), and computerized visual field in both eyes. Pupils were normal without a relative afferent pupillary defect. Left exophthalmos measured 5 mm on Hertl exophthalmometry without resistance to retropulsion and forced duction test was equivocal. Extreme upgaze was restricted in the left eye. Slit-lamp and fundus examination were normal on both sides. Intraocular pressure was 14 mmHg right and 13 mmHg left. The patient exhibited features suggestive of acromegaly. Brain and orbit magnetic resonance imaging (MRI) revealed a large pituitary tumour, measuring 30 mm in vertical diameter and 50 mm transversally (Figure 1). The sphenoidal clivus was destroyed, the tumour deformed the pons and the left cerebral peduncle, invaded the optochiasmatic cistern superiorly, filled the sphenoidal sinus inferiorly, and entered the left orbit. Within the orbit, the tumour displaced the lateral rectus muscle and the optic nerve. The tumour also infiltrated both cavernous sinuses, even beyond left cavernous sinus lateral wall and entrapped the left internal carotid artery.

Blood studies revealed elevated levels of prolactin (5480 μg/l, norm 2–19) and growth hormone (24 μg/l, norm 0–5). Treatment was started with oral bromocriptin 10 mg/day. Evolution was favourable with a progressive reduction in exophthalmos. Tumour size decreased on follow-up MRI.

At 1 year after diagnosis, the patient was still treated with oral bromocriptin (15 mg/day) and complained only of occasional vertical diplopia on extreme upgaze. Left exophthalmos decreased to 3 mm without resistance upon globe retropulsion. Upward gaze was limited in the

Table 1 Summary of clinical findings in patients with orbital invasion from pituitary adenoma

Author/year of publication	*Age/sex*	*Exophthalmos*	*Diplopia*	*Visual acuity loss*	*Optic disc atrophy*	*Visual field defect*
Jackson/1962	NS[a]/M[b]	Y[c]	NS	NS	NS	NS
Jackson/1962	NS	Y	NS	Y	NS	NS
De Divitiis/1973	29/F[d]	Y	NS	Y	NS	Bitemporal hemianopia
Wray/1977	71/F	Y	Y	Y	Y	Unilateral temporal hemianopia
Sammartino/1979	12/M	Y	Y	Amaurosis	Y	NS
Yovos/1981	17/F	Y	NS	NS	Y	Homonymous hemianopia
Daita/1987	50/M	Y	NS	6/60	Y	Bitemporal hemianopia
Ross/1989	8/M	Y	NS	N[e]	N	N
Ortiz/1992	16/M	Y	NS	Amaurosis	NS	NS
Spiegel/1994	25/F	Y	NS	CF, then HM[f]	Y	Unilateral constriction
Bernardini/2001	47/F	Y	NS	N	N	Superotemporal scotoma
Karcioglu/2002	26/M	N	NS	6/60 OD, 6/12 OS	N	Bitemporal hemianopia
Karcioglu/2002	24/F	Y	NS	HM	Y	Unilateral constriction
Karcioglu/2002	35/M	Y	NS	Not assessable	NS	Not assessable
Karcioglu/2002	33/F	N, then Y	NS	6/30 OS, 6/6 OD then amaurosis OS and 6/7.5 OD	NS	Temporal quadrantanopia OS, normal OD then amaurosis OS, temporal hemianopia OD
Present case	30/M	Y	Y	N	N	N

[a]Not specified.
[b]Male.
[c]Yes.
[d]Female.
[e]No.
[f]Count fingers, then hand motion.

left eye with a positive forced duction test, probably secondary to partial fibrosis of the left inferior rectus muscle. Visual acuity, colour vision, and computerized visual fields were normal in both eyes. The patient was then lost to follow-up.

Comment

Progressive exophthalmos in an otherwise healthy 30-year-old adult is usually suggestive of TAO. Blood levels of T3, T4, and TSH were normal and orbital CT scan was reported as normal. The later complaint of transient vertical diplopia was still suggestive of TAO, but acromegalic features (prominent forehead, prognathism, enlarged digits) were noticeable on patient's examination. A secreting pituitary tumour was diagnosed based on elevated blood levels of prolactin and growth hormone. MRI revealed a large macroadenoma invading the left orbit (Figure 1).

Orbital invasion by a pituitary adenoma is a rare event, and only 15 such patients have been reported.[1–11] Details are summarized in Table 1. Visual function is usually markedly impaired in patients presenting with orbital invasion from pituitary adenoma.[1–8,11] Only two cases have been reported so far with no visual dysfunction[10] or slight visual field defect.[9] Despite the large adenoma invading his left orbit (Figure 1), there was no visual dysfunction in our patient.

MRI revealed that the intracranial visual pathways of our patient were neither compressed nor invaded and showed that the tumour spread intraorbitally only through the left superior orbital fissure (Figure 1). The intracanalicular left optic nerve was thus spared and visual function was preserved. Although such radiologic details are not available from the published data, we hypothesize that optic canal invasion was responsible for the severe visual dysfunction,[1–8,11] whereas a good visual outcome might result when orbital invasion occurs through the superior orbital fissure only,[9,10] as in the present case.

Our patient demonstrated minimal manifestations of an invading macroadenoma mimicking initially TAO.

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Sir,

Vitreous cyst and a cataract in a toddler
Eye (2003) **17,** 1034–1036. doi:10.1038/sj.eye.6700493

Vitreous cysts have been reported sporadically in the literature since Tansley's[1] first description in 1899. Numerous associations have been described in conjunction with these cysts, including retinitis pigmentosa,[2] uveitis,[3] and chorioretinal atrophy.[4] We describe a case of a vitreous cyst associated with a unilateral cataract in a toddler, which is a new association. We also believe this to be the youngest reported case of a vitreous cyst.