ABNORMAL HEAD POSTURES A REVIEW OF 116 PATIENTS

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Abstract

One hundred and sixteen patients with abnormal head postures (AHPs) were analysed from the aetiological viewpoint. Ophthalmological, neurological and orthopaedic causes of AHPs were identified in our group of patients. Intraocular lenses were found to be associated with an AHP in two patients, and this may be the first report in the literature of an AHP in association with intraocular lens implantation. An appeal is made to both ophthalmologists and orthoptists for a multidisciplinary approach to managing AHPs.

Key words: *Aetiology, intraocular lens implantation, multidisciplinary approach.*

INTRODUCTION

Since the days of isolation of specialist disciplines in medicine are now well past, the tendency of ophthalmology and orthoptics today should be towards a broad concept of medicine. The patient should now be regarded as a whole medical unit, with every medical specialty contributing to his management. Further, the patient with an AHP should no longer be regarded as having an isolated set of abnormal ocular rotations with a Hess chart report attached.

It is with this in mind that we reviewed a series of 116 patients who were observed to have an AHP. Initially, this sign was sought after an abnormality of ocular rotations was diagnosed. As the study progressed, we believe our clinical index of ability to observe increased, so that recognition of an AHP became an important feature of our primary, if unconscious, observation of the patient as a whole at the initial examination.

This paper attempts to show that

(i) AHPs are perhaps more common than ophthalmologists and orthoptists may previously have recognised.
(ii) There is almost always an organic cause for an AHP.
(iii) The cause is not always related to an abnormality of ocular rotations alone, but can often be related to one of the other medical or surgical disciplines.

The Normal and the Abnormal Head Posture

Description of an AHP first requires definition of the normal head posture. This is the situation

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when the body is erect and facing forwards, and the median plane of the head is continuous with the median plane of the body, and the retinal horizon coincides with the horizontal meridian of the eyes, cutting the median plane at right angles.[1] This normal head posture is maintained by anatomical structures (for example spinal column and neck muscles) and physiological functions (for example proprioceptive and cerebellar feedback systems).

The abnormal head posture, on the other hand, is an "abnormal position of the head", and has three components[2]

(i) Head tilt to the right or the left.
(ii) Face turn to the right or the left.
(iii) Elevation or depression of the chin.

Head postures may be normal in situations such as extending the neck for increased height gain for the eyes; in order to see through bifocals; or in infants who normally have poor neck support for their head.

The Importance of the Abnormal Head Posture

AHPs may result from a pathological condition, either organic or psychological. They are important for two main reasons. Firstly diagnostically, a VIth nerve palsy[3,4] and associated head turn may underly a previously unrecognised pathological condition for example raised intracranial pressure, diabetes, or vasculitis. Secondly therapeutically, since corrected the sequelae of neck pain, scoliosis and secondary arthritis may be avoided.[5,6]

The Purpose of an AHP

The work by Wesson[1] is still as valid as it was. However, it must not be forgotten that neurological and orthopaedic problems may result in AHPs, just as disorders of ocular rotations may also, for example, Duane's syndrome, which has now been recognised to be due to an agenesis of the VIth nerve nucleus.[7] The AHP may be valuable to the patient in order to:[1]

(i) Improve vision, for example nystagmus compensation or refractive errors.
(ii) Centralise visual fields, for example with one blind or absent eye, hemianopia or ptosis.
(iii) Improve binocularity, for example A or V pattern.
(iv) Increase visual comfort, for example diplopia, or chin up posture in presbyopia to increase physiological convergence.
(v) Protect the eyes, for example chin down and brows forward in photophobia.
(vi) Relieve pain, for example superior corneal foreign body.
(vii) Improve cosmesis, for example where a patient with a VIth nerve palsy trades off the lesser cosmetic evil of a turned face for heterotropic eyes.

Numerous authors in the past have mentioned other, non-strabismic, causes of AHPs. Haessler[8] gave "habit" as a major alternative cause, Hugonnier[9] emphasised "other pathology", von Noorden and Maumenee[4] mentioned "other conditions" while Walsh and Hoyt[10] gave an extensive and excellent classification (despite omitting refractive errors as a cause!). Walsh and Hoyt[10] emphasised a neuro-ophthalmological approach to AHPs, stating that

(i) If the AHP was not a pain compensation mechanism, then
(ii) The range of neck motion should be determined, to exclude contractures, bony obstruction or meningismus, then,
(iii) The neck should be palpated for cervical lymphadenopathy, and
(iv) The ears should be examined for inflammation or deafness.
(v) Diplopia testing should then be performed, and a
(vi) Complete neurological examination done.

However, even after all of this, they were sometimes forced to conclude that the patient had "just a head tilt".

Other workers have more recently described series of patients with AHPs. Urist[11] described 226 patients with a vertical muscle imbalance. 72 of these had a head tilt, and all of them tilted to the expected side. It was surprising that most of them did not have an AHP, as one would have expected. Kushner[12] described 188 patients

with AHPs, excluding all other than ocular causes for these. Most (62.7%) were due to incomitance, while 20.2% were due to nystagmus. Congenital esotropia, the requirement for foveal fixation, cosmesis, ocular motor apraxia, spasmus nutans and astigmatism were rare causes.

PATIENTS AND METHODS

Our series comprised 116 patients who were observed to have AHPs. Slightly less than half of these (53) were drawn from three general ophthalmic practices and one general hospital clinic, and slightly more than half (63) from the orthoptic department of Sydney Eye Hospital. The majority of patients drawn from the orthoptic department collection was seen by one of us and enough information was available from the files of this group of patients to give an adequate explanation of the mechanism of their AHP. Since this group of patients was seen in an orthoptic department, it undoubtedly skewed the causes of the AHPs towards disorders of ocular rotations. Each of the patients seen otherwise had a full ophthalmic and general history taken, and a complete visual system examination done.

RESULTS

The age range of the patients was 5 months to 73 years. The majority of patients had a tilt, 67 (58%) of 116 tilting, while 40 (34%) had a turn, and 9 (8%) had a chin up or chin down posture. We categorised these groups into their most obvious type of AHP rather than a combined type of AHP.

We categorised the aetiology of the AHP (see Table 1) into seven major groups. A brief description of each of these groups follows.

TABLE 1
Aetiological Categories of Abnormal Head Posture
116 Cases

(i) Disorders of ocular rotations	86
(ii) Visual improvement	13
(iii) Orthopaedic	6
(iv) Habit	4
(v) Deafness	3
(vi) Neurological	3
(vii) Idiopathic	1

(i) *Disorders of ocular rotations*

(a) IVth nerve palsy. Of the ocular motor disorders, 43 patients (51%) had a IVth nerve palsy, 30 tilted to the expected opposite side and 8 tilted to the same side, 4 had a chin down posture, 2 being unilateral IVth nerve palsies, and 2 were bilateral with V patterns, 1 had a turn, due to one eye being amblyopic, and we postulated that the turn may have increased the patient's visual field. The 8 who tilted to the same side may have tilted to increase image separation. On the other hand, Duke-Elder's explanation[3] of the tilt being to the same side may be valid — that is, the torsional effect of the overacting contralateral synergist may exercise the main effect. Hilton's[5] recent observation is pertinent, that "the literature reveals a lack of agreement" as to the direction of the head tilt that accompanies vertical ocular muscle paresis.

(b) Duane's syndrome — 21 had Duane's syndrome. As expected, 10 with eso-Duane's turned to the same side, and 5 with exo-Duane's turned to the opposite side, 4 turned to the unexpected side, and we wondered whether this was cosmetic on the basis of ptosis improvement. Finally, 2 tilted to the opposite side, and Duane's-associated deafness may have been causative here. We would agree with Isenberg and Urist[13] that if a patient has a tropia in Duane's syndrome, he will almost certainly have an AHP.

(c) Exotropia. There were 5 patients with exotropia. Even when intermittent, exotropia seemed to be associated with an AHP, and 3 turned to the expected opposite side. The 2 others turned to the same side for no reason we could determine.

(d) Esotropia. Esotropia produced an AHP in 5 patients, where 2 were cross-fixators, possibly preferring to look with a dominant eye, 1 had an esotropia with a turn to that side, 1 had an alternating esotropia with

no binocular vision and a chin down position possibly, cosmetic, and 1 other, for no obvious reason, turned to the opposite side.

(e) Orbital fracture — 4 patients had orbital fractures, 3 involved the orbital floor, and they tilted to the side of the hypotropic eye, presumably reducing tension on the entrapped orbital tissue, 1, with a pseudo-VIth palsy, due to a medial wall fracture, turned to the same side.

(f) VIth Nerve Palsy — 3 patients had a VIth nerve palsy, and turned to the expected ipsilateral side.

(g) Supranuclear Palsy — 1 patient had a vertical gaze palsy upwards, with his chin elevated, as did 1 other patient with the Steele-Richardson syndrome and defective upgaze.

(h) IIIrd Nerve Palsy — 1 patient with a IIIrd nerve palsy tilted to the side of the hypotropic eye.

(i) Orbital infiltration — 1 patient with orbital lymphoma in his left inferior orbit had a slight chin up AHP.

(j) Orbital Asymmetry — 1 patient had congenitally asymmetric orbits and a right hypophoria with a tilt to the expected right side.

(ii) *Visual Improvement*

(a) Visual Acuity — Of the 13 patients who gained visual improvement from an AHP, 3 did so in terms of improved visual acuity, 2 of these had intraocular lenses, and felt that vision was of better quality with an AHP. We wondered whether less pseudophakodonesis, fewer internal ocular reflections, or possibly even less astigmatism may have been responsible. We felt it unlikely that the AHP would produce any anatomical structural sequelae because of its transient nature; 1 myope with big brows saw better binocularly when the more myopic eye secured the pinhole effect by looking under its brow with that eye in adduction. (See Figure 1.)

(b) Ptosis — 2 patients had ptosis due to levator aponeurosis dehiscence, and had better vision with a chip up AHP.

(c) Field — 1 uniocular patient improved his field of vision with a head turn to the anophthalmic side, and another patient with unilateral amblyopia due to high myopia similarly improved his field; 1 patient with a monocular cataract was able to improve his vision by means of adopting an AHP, probably on the basis of increased field.

PATIENT WITH RIGHT MYOPIA AND AHP (see text)

FIGURE 1.

(d) Nystagmus — 5 patients had nystagmus, 2 with a face turn producing nystagmus compensation for congenital nystagmus; 1 had bilateral macular toxoplasmosis, and 1 had congenital cataracts. The final patient had a right lateral medullary syndrome, with skew deviation, and a right-beating nystagmus worse on right gaze. His AHP could, we felt, be explained in part by the ocular tilt reaction described by Rabinovitch.[14]

(iii) *Orthopaedic*

6 patients had AHPs, 3 having multiple sclerosis and secondary structural deformities, while 1 had a shoulder injury and 1 had a subluxated

atlas, 1 patient had polio with a scoliotic deformity, and a coincidental exotropia. The importance of not missing a disorder of ocular rotations in a patient who has also been traumatised from the orthopaedic viewpoint has recently been emphasised.[15]

(iv) *Habit*

4 patients had an AHP from habit. Often these AHPs were transient, and related to specific tasks (for example, reading), and no ocular motor or systemic abnormality was present. The patients were frequently unaware of their AHP, and said they just felt more comfortable with it when it was pointed out to them.

(v) *Deafness*

3 patients had an AHP used with a view to improving hearing.

(vi) *Neurological*

1 patient had cerebral palsy, with its own characteristic AHP. Another had superior oblique myokymia, with the left eye affected and intorting, and compensated by tilting to the right. AHPs would appear to be unusual in superior oblique myokymia.[16] 1 patient had what we felt was spasmodic torticollis.

(vii) *Idiopathic*

In only 1 patient of 116 could we find no cause for an AHP.

DISCUSSION

Of the 116 patients we have described, most did indeed have a disorder of ocular rotations as the cause of their AHP. Most of these patients had IVth nerve palsies, and a patient presenting with an AHP should have a IVth nerve palsy excluded early on, although of course not all patients with IVth nerve palsy have an AHP.[12] Duane's syndrome was also a common cause of AHP in our series, as were exotropia, esotropia, nystagmus and blowout fracture. The second largest group of patients was able to improve visual acuity, visual field or visual comfort by utilising an AHP, and some of these patients could easily be helped by simple measures such as correction of refractive error or ptosis surgery. This group included 2 patients with AHPs and intraocular lens implants. These patients had no evidence of any neurological, orthopaedic or ocular motor disorder, and both patients felt that vision was clearer with an AHP. We believe that these 2 patients may be the first patients described to have an AHP due to, perhaps, intraocular lens implantation. It was interesting that the intraocular lenses were of the Worst Medallion iris clip type. Orthopaedic causes were probably coincidental in our series, but better liaison between ophthalmologists and orthopaedic surgeons may prevent the complications of untreated AHPs associated with scoliosis due to IVth nerve palsy. However, it is fortunate that surgery for IVth nerve palsy has now advanced considerably.[17] Habit, deafness and purely neurologic lesions did play a small part in our series, and such causes should be kept in mind in assessing a patient with an AHP. In particular, spasmodic torticollis,[18] a difficult diagnosis, should be remembered, since the prognosis, probably without surgery, may be bad.[19] It was gratifying that in only 1 of our 116 patients could we not find a satisfactory explanation for an AHP. Nevertheless we think it will be a challenge for ophthalmologists and orthoptists to determine the cause of AHPs in conditions other than those explained by ocular motility defects.

In conclusion, O'Donnell's and Howard's observation[20] is pertinent. "While a careful eye examination is necessary to rule in or out an ocular muscle palsy, it is important that non-ocular causes of torticollis be considered and correctly identified."

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