

THE ORTHOPTIC ROLE IN HEAD INJURIES

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Abstract

Seven case reports demonstrate some of the problems which arise in the correct diagnosis, prognosis and treatment of head and facial injury patients with ocular involvements. The orthoptist's role is twofold, aiding the patient therapeutically and the whole medical team diagnostically.

Key Words

Head injuries, nerve palsy, loss of fusion, diplopia, Fresnel prisms, torsion, Hess.

The role of the orthoptist in the care of patients with head injuries is firstly diagnostic, assessing the effect of the injury on the oculomotor system, and secondly therapeutic, relieving the patient's symptoms, restoring his confidence and helping him to return to some useful activity.

Head injuries can affect both ocular movement and binocular vision. Defective ocular movement can result from infranuclear palsies affecting the VIth, IVth and IIIrd cranial nerves; much more rarely it can be caused by supranuclear lesions or by convergence palsy. Binocular vision can be affected by decompensation of a heterophoria, by loss of fusion in some very severe injuries, or by disruption of suppression in an old squint.

The main symptom is almost always diplopia but the treatment and the medico-legal implications are so different that the differential diagnosis of the cause of the diplopia is all-important.

DIAGNOSTIC PROBLEMS

In severe head injuries the picture is often confused by bilateral or multiple nerve involvement, by facial injuries causing orbital fractures, by damage to the globe, and, of course, by the patient's general condition. The following case reports are examples of the problems which can arise:

Case 1

A man aged 20 years was referred to the eye department 10 days after striking his head

against a wall in a road accident. The left pupil was dilated and a third nerve palsy was therefore suspected. A temporal field loss was found and there was insuperable diplopia. The Hess chart (Fig. 1) confirmed a bilateral superior oblique weakness. The patient's diplopia was mainly torsional. Bilateral IVth nerve palsies due to avulsion of the nerve rootlets are not uncommon in injuries of this type, making spontaneous recovery unlikely.

Case 2

A girl aged 18 years had sustained left IIIrd, Vth, VIth and VIIth nerve palsies 4 months previously. She also had a left Horner's syndrome. There had been some spontaneous improvement but ocular movement was still limited. It was noted that the left eye was red and proptosed and further examination revealed a bruit due to a carotico-cavernous fistula. Ligation of the common carotid resulted in immediate improvement and there is now only residual diplopia on extreme abduction.

Cases in which head and facial injuries are combined present special problems. If the limitation of ocular movement is caused by an orbital fracture early treatment may be indicated but if it is due to an infranuclear palsy then time must be allowed for spontaneous improvement. Examples of this problem are seen in the following cases.

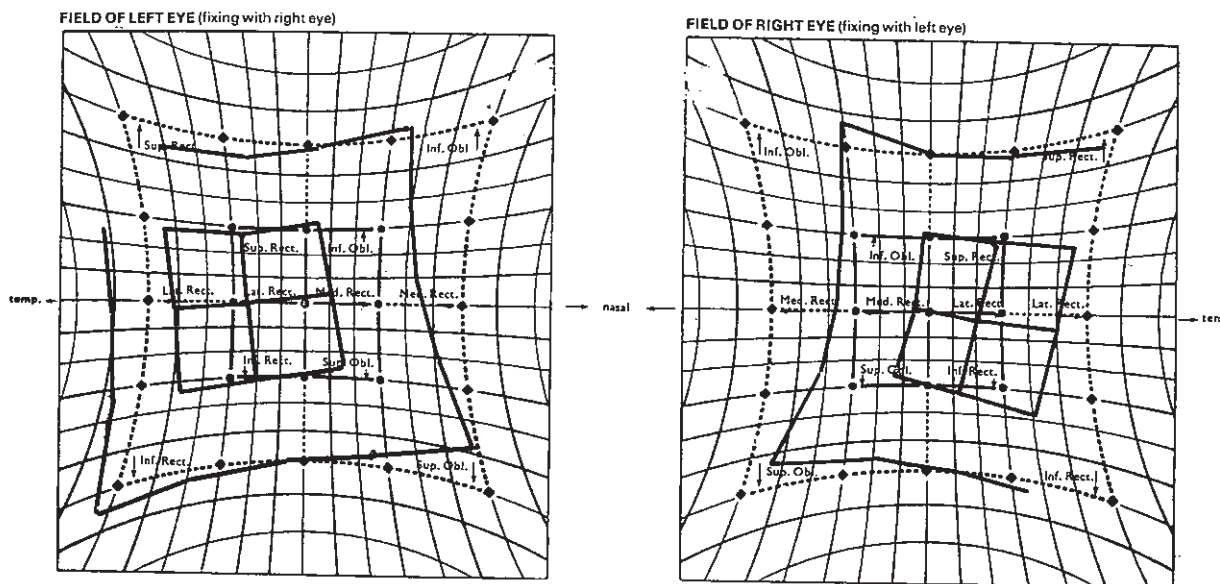


FIGURE 1
J. D. 27.9.79
Hess chart plotted 10 days after head injury showing bilateral superior oblique weakness (Case 1)

Case 3

This patient, a man of 26 years, was first seen a few days after sustaining a very severe head injury. He presented with constant vertical diplopia, a left optic atrophy, which reduced his visual acuity to 6/12, a fractured left maxilla and a complete VIIIth nerve palsy. As can be seen from the Hess chart, (Fig. 2) it was impossible to explain his diplopia by a clear-cut underaction of any ocular muscle. There was no torsional displacement of the images. There was no enophthalmos nor retraction of the globe on testing ocular movement. The patient was kept under observation and the orbital fracture was not treated. The diplopia remained unchanged in spite of good vertical ocular movement. Fresnel prisms were prescribed. Spontaneous recovery of the diplopia took place 12 weeks after the injury and there has been slower recovery of the facial palsy. In retrospect it is possible this patient had a skew deviation. He reported that his diplopia resolved suddenly, it was apparently unchanged on waking and fused with the prisms. Later the same day he noticed reversed diplopia with the prisms, and could fuse the images without them. We have several times seen patients who report this sudden resolution of their diplopia.

Case 4

An elderly man presented with what appeared to be a typical superior oblique palsy but he had sustained several facial lacerations from windscreen glass, including a deep right upper lid cut which extended nasally to the trochlear region. It was therefore questioned whether there was a trochlear injury or a IVth nerve palsy. There has been no change in the four months which have elapsed since the onset. The patient has been observed for signs of a developing pseudo-Brown's syndrome but these have not become apparent and a traction test has not confirmed a mechanical limitation of movement. The patient is currently using vertical Fresnel prisms to see if he can overcome the torsional displacement of the images.

THERAPEUTIC PROBLEMS

Loss of fusion following severe head trauma or a bad whip-lash injury is a rare diagnosis. Apparent inability to fuse can be due to other factors such as visual field loss, especially bi-temporal hemianopia, insuperable torsion, a grossly inconstant deviation or simply a long-standing loss of binocular single vision (BSV). An example of this is seen in:

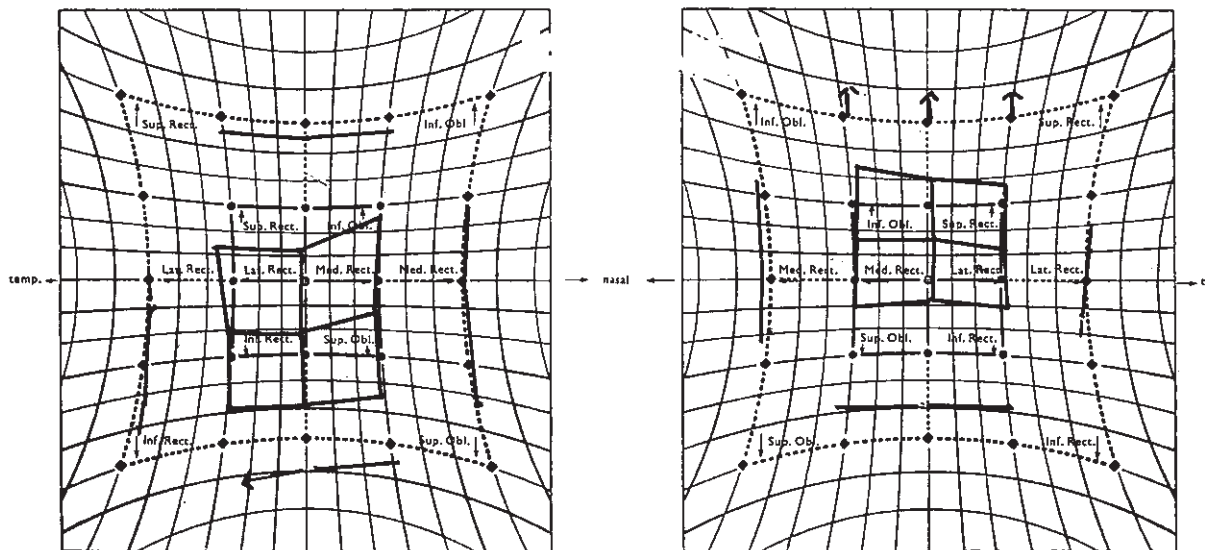


FIGURE 2
M. B. 29.4.80
Hess chart plotted 4 weeks after head injury showing vertical deviation not attributable to specific ocular muscle underaction. (Case 3)

Case 5

This patient is a 57 year old doctor in general practice, had sustained a head injury at 18 years and remembered experiencing vertical diplopia at that time but claimed that it had resolved without treatment. At 53 years he developed a cataract in one eye which was treated by lens extraction and a contact lens. He then complained of almost constant vertical and torsional diplopia due to a marked unilateral superior oblique palsy. His symptoms disappeared when he developed a cataract in the other eye but recurred when he was wearing contact lenses for bilateral aphakia. It proved impossible to demonstrate fusion: even using a synoptophore with the torsion corrected the patient stated that the images were never more than "nearly together". Because of a torticollis, and his conviction that he had had BSV, an inferior oblique myectomy was performed and the patient was sent home with vertical prisms to compensate a residual hypertropia. One month later BSV was present without prisms.

We believe it is essential to restore BSV whenever possible and therefore make much use of Fresnel prisms, keeping a supply of plano spectacles for emmetropes. Overcoming diplopia gives the patient confidence and helps him to cope with his other disabilities; it is also beneficial to the

other therapists concerned with his rehabilitation. The individual's attitude to his injury and to prisms varies considerably and the orthoptist can do much to inspire him to make the most of even a small area of BSV.

Recovery of ocular movement in head injury cases is apparently unrelated to the severity of the trauma, some of the most intractable cases are those with relatively minor closed head injuries, as illustrated by the following case.

Case 6

A man aged 50 years slipped on ice and struck his head; he did not lose consciousness and did not visit his doctor until he developed diplopia next day, when a superior oblique palsy was diagnosed. (Fig. 3a). Not only did the superior oblique palsy fail to recover over the next few months, but he developed an unexplained underaction of the eye on elevation (Fig 3b). There was no facial injury and X rays of the skull and orbits were normal. The palsy and the apparent inferior oblique underaction started to improve 6 months after the injury and recovery of movement was virtually full.

Six months is generally accepted as the period which should be allowed for recovery and before performing muscle surgery. In cases of complete paralysis it is tempting for the surgeon to operate sooner, even in the absence of electromyographic

evidence of denervation, since increasing contrac-
ture of the ipsilateral antagonist of the affected
muscle will occur. The right time for surgical
intervention is debatable.

Case 7

A lorry driver sustained a bilateral Vth nerve
paralysis in a road accident. There was partial
recovery of abduction on one side but none

on the other. The patient had a large angle
esotropia, the most affected eye was occluded
and he was unable to work. He was seen at an
inter-hospital case conference and a Jensen's
operation on the paralysed lateral rectus was
suggested but due to an administrative delay he
was not admitted until 16 months after the
injury. Ocular movements were unchanged
2 months before admission but on admission it

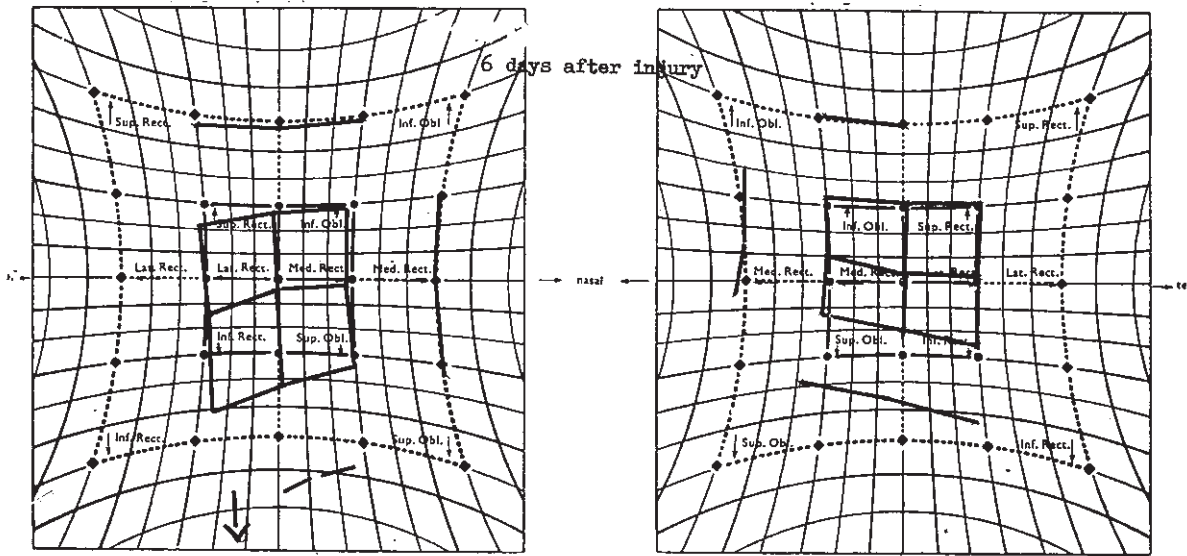
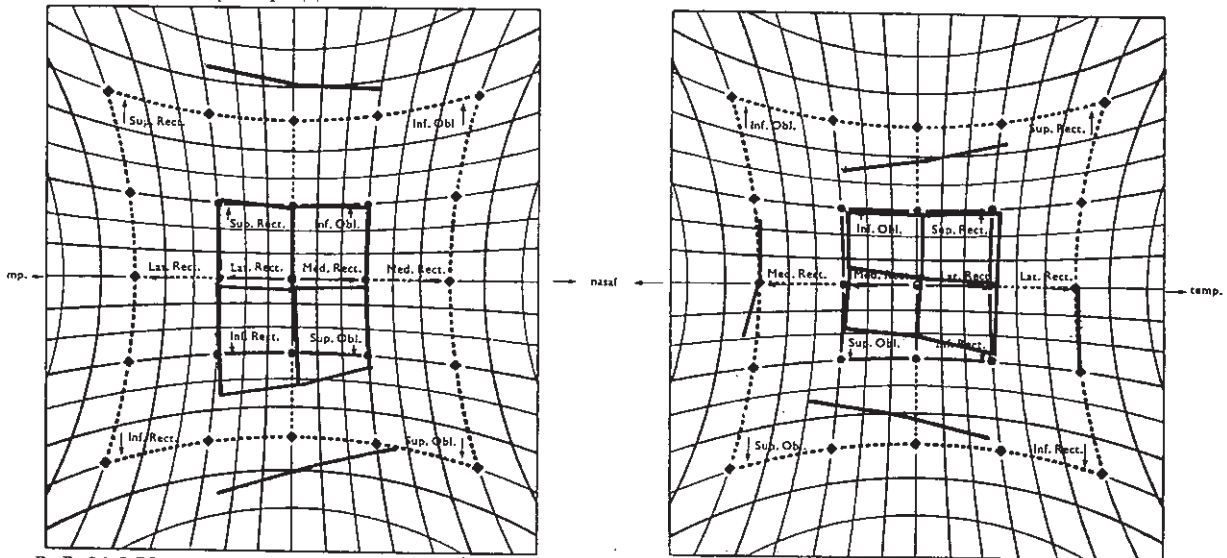


FIGURE 3a
R. P. 6.2.79
Hess chart plotted 6 days after minor head injury showing right superior oblique palsy. (Case 6)



R. P. 21.5.79
Hess chart plotted 3 1/2 months after injury showing development of apparent ipsilateral inferior oblique weakness. (Case 6)

was found that the paralysed eye could abduct 10° past the mid-line. The patient became aware of the improvement in abduction 4 weeks earlier. Conventional squint surgery was performed in two stages and BSV was restored sufficiently for him to return to lorry driving.

This case is an extreme but not unique example of delayed recovery of movement, perhaps suggesting that 6 months is too short a waiting time but

against this must be weighed the demoralising effect of unemployment and the fear of losing a job.

In summary, the orthoptist can be of service not only to the patient with a head injury but also the whole medical team, including the ophthalmologist, neurosurgeon, neurologist and members of the other paramedical professions. The orthoptic findings and careful records can aid diagnosis and lead to effective therapy.