Self-inflicted orbitocranial injury with a plastic ballpoint pen

D. I. BOWEN

Cardiff Royal Infirmary

Self-inflicted ocular injuries are not unusual in psychologically disturbed patients, but only very rarely is a suicide attempt made by stabbing through the orbit. The patient, whose history is reported here, drove a ballpoint pen through the wall of his orbit into the intracranial cavity in a bout of depression, and not only survived but retained fairly good vision. He was probably attempting suicide, though an ocular injury may have been his sole intention.

Case report

A 44-year-old shopkeeper was admitted to hospital in a drowsy state after taking an overdose of phenytoin and phenobarbitone, which he had found in his sister's medicine cabinet. He had been depressed for about 2 years. He recovered rapidly from the overdose, but he was retained in the general ward rather than transferred to the care of the psychiatrists because he had a persistent low-grade pyrexia, which was probably related to pulmonary shadows seen at both apices on chest x ray. During this period he was depressed and tearful.

He was found unconscious in the ward bathroom 5 days after admission. Examination revealed right-sided spasticity and lumbar puncture showed uniform blood-staining of his cerebrospinal fluid. A diagnosis of cerebrovascular accident was made, but was soon revised when a straight x ray of the skull (Figs 1 to 3) revealed a ballpoint pen (Fig. 4) within the cranial cavity. The pen had apparently been thrust through the right orbit across the midline of the head into the left temporo-occipital region, and the x rays suggested that the end of the pen might still be present in the orbit.

Operation

Under general anaesthesia, therefore, an ophthalmologist explored the orbit, while a neurosurgeon stood by in case any intracranial manoeuvres became necessary. Conjunctival tears were found in both medial canthi suggesting that an attempt had been made to push the pen into the left orbit before succeeding on the right side. 1 cm. of the hilt was found in the orbit with the rest beyond a hole in the ethmoid bone. The pen was withdrawn through the orbit, while the neurosurgeon stood ready to apply carotid compression. A gush of cerebrospinal fluid followed, but there was no haemorrhage.

Progress

Postoperatively he was treated with systemic chloramphenicol and his condition gradually improved over the next 2 days. He became accessible to simple commands, and movements began to return in the right arm and leg. A week later, however, neck stiffness developed, and, although the cerebrospinal fluid was sterile, the level of consciousness deteriorated. There was also a profuse cerebrospinal leak from the right nostril.

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Address for reprints: Department of Ophthalmology, Cardiff Royal Infirmary, Newport Road, Cardiff, CF2 1SZ.

FIG. 1 *Radiograph of skull, lateral view*

FIG. 2 *Radiograph of skull, basal view*

Second Operation

Intracranial exploration was clearly indicated and 9 days after the first operation a right frontal craniotomy was carried out through four burr holes. It was found that an aerocele had developed in the subdural space and was compressing the brain. There was a large hole in the jugum sphenoidale in the midline exactly between the two optic nerves and a few fragments of bone were lying loose in the opening. A plug of muscle was pushed into the hole and covered with pericranium taken from the bone flap.

Result

The patient's condition improved steadily after this procedure, and he was transferred to a psychiatric hospital 16 days after the second operation.

FIG. 3 Radiograph of skull, antero-posterior view

FIG. 4 The ballpoint pen (cm)

Follow-up

2 years later he was cheerful, cooperative, and alert, and was living at home. He said that he had no recollection of his injury or of his stay in the Neurosurgical Unit, but he knew what he had done to himself. He had found this out when he was being examined by some students and his wife had filled in the details. He was well adjusted to his right hemiparesis and was able to walk without too much difficulty with the aid of leg calipers. The right arm and hand, however, were not much use to him, and he volunteered the information that his sense of smell had been poor since his injury.

The visual acuity was 6/9 part in the right eye, with -16 D sph., -2 D cyl., axis 50° , and 6/5 part in the left eye, with -3.25 D sph., -3 D cyl., axis 145° . Ocular movements were full and the pupils equal, but their reaction to light was sluggish on both sides. The left disc was pale and atrophic and the visual field grossly contracted. The right fundus showed the characteristic temporal disc crescent and atrophic posterior pole associated with high myopia, but the disc itself had a good colour and the right visual field showed no gross changes. Both intraocular pressures were normal. There was slight diminution of pin-prick sensation in the distribution of the first and second divisions of the right trigeminal nerve, but both corneal reflexes were normal. Facial movements were full and speech normal. Examination of the limbs showed a marked right spastic hemiparesis.

Comment

2 years after the injury this patient shows the following abnormal neurological signs: minimal right trigeminal neuropathy affecting the upper two divisions, left optic atrophy with contraction of the left visual field, anosmia, and a right spastic hemiparesis. The pen is known to have entered the right ethmoid bone in the orbit, emerged into the cranial cavity through the jugum sphenoidale, and passed backwards, upwards, and laterally for a distance of some 9 cm. The pen, therefore, in its course must have injured the olfactory tracts, the intracranial portion of the left optic nerve, and the left cerebral peduncle. The right trigeminal neuropathy is more difficult to explain, although some branches of the ophthalmic division may have been injured by the pen in the orbit.

The patient had no recollection of his injury and it is not possible to say with any certainty whether he was trying to take his own life or to injure his eyes. Self-inflicted ocular

injuries are not unusual in psychotic patients and are often severe. Chemical burns of the conjunctiva and cornea (Duke-Elder, 1954), penetrating wounds of the globe (Byrnes and Shier, 1949; Riebel, Anton, and Kumstát, 1961), and self-induced solar retinopathy (Anaclerio and Wicker, 1970) are some of the means by which such patients harm their eyes. The most violent injuries on record are autoenucleations. Davidson (1962), in a study of self-mutilation, found in the literature eight patients who had torn out both their eyes, and more recently Gorin (1964) and Malevitis, Arapis, and Stamatini (1965) described two further instances of autoenucleation in psychotic patients. It is possible that the patient whose history is reported here was motivated in a similar manner, although suicide was probably his objective. Albert, Burns, and Scheie (1965) reported the case of a psychotic patient who attempted suicide by thrusting a 6-in. pencil through his upper lid, orbit, and sphenoidal fissure into the intracranial cavity. Treatment consisted of a fronto-temporal craniotomy with removal of the pencil *via* the orbit, and a total ophthalmoplegia and optic atrophy with blindness on the affected side resulted from the injury. This is the only report found in the recent literature which resembles the case presented. A final possibility is that of an accidental injury in which the patient fell while holding the pen close to his eye. This seems unlikely because the end of the pen was found deep in the orbit and also because of the conjunctival lacerations in the opposite eye.

Summary

A patient thrust a plastic ballpoint pen through the wall of his right orbit into the intracranial cavity in a bout of depression. The pen was removed *via* the orbit and the subsequent management is described. The injury resulted in left optic atrophy, anosmia, and a right spastic hemiparesis.

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