INTRA-OCULAR FOREIGN BODIES*

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Localisation

The first essential for dealing with foreign bodies within the eyeball is exact localisation. (Cf. "La cataracte, c'est l'incision.") Among the most important cases are those in which the vision of the injured eye is good, but the foreign body is too far forward to be seen with the ophthalmoscope. For these, my method of projection is as follows (see Fig. 1).

FIG. 1.

Relation of the foreign body to visual axis in an eye in which there is good vision.

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In the dark room a metal bush or eyelet is punched through a dental film, complete in its original coverings. In the X-ray room, the cylinder of the X-ray tube is pointed at its own reflection in a mirror on the wall. The patient's head is next interposed. He must watch in the mirror through the pin-hole (held close to

FIG. 2.

Relation of the foreign body to contact glass and horizontal axis of the eyes.

the eye) that the film is absolutely level. The superior temporal angle of the film is marked with a suitable clip. It is well to verify that the correct pink side of the film is towards the tube. The radiologist should be able to report from the finished skiagram the distance and bearing from the visual axis of the foreign body.

If the vision be lost, a contact glass is put in the eye, and with a side to side projection, two consecutive exposures are made on the same film (see Fig. 2), the patient looking with the other eye first at one and then at another marked point on the wall in the same

plane as the film. The distance between these two fixation points should be equal to their radial distance from the centre of the eye. The radiologist is now able by putting a halfpenny on the finished film, to outline the eyeball and to report the distance and bearing of the foreign body from the horizontal axis of rotation of the eyes. Antero-posterior projections are misleading if made without visual fixation with the other eye, but one can estimate the error from the shadow of the contact glass.

If a contact glass be not available, a geometrical construction is substituted, but the slightest movement of the skull must be prevented. With the patient lying down on the injured side, let the visual axis turn through 60 deg. parallel to the sagittal plane. Then the foreign body rotates through 60 deg. in a horizontal plane. The path traced out by corresponding points on the foreign body is an arc, the chord of which forms with the two radii an equilateral triangle. The point of bisection of the arc gives the position of the foreign body when the patient is looking directly forward. The actual construction is to form an equilateral triangle base *ac* whose apex is therefore the centre of the eyeball. Bisect *ac* and produce the radius through this point to *f* so that *o.f.* is equal to *ac*. The foreign body is at the centre of the arc *ac* when the eye is directed forward.

Employment of magnetism

The mass and magnetic susceptibility of foreign bodies are variable and outside our control. The core of an electromagnet, on the other hand, should be most carefully designed for high permeability and low hysteresis loss, if it is for use with alternating current. An alternating field is very effective at close range for extricating ferrous fragments. All magnets should be designed for operating with the patient recumbent, lest syncope should complicate the proceedings.

Surgical observations

After removal of a foreign body from the crystalline lens through a corneo-scleral incision, with iridectomy, spontaneous absorption of the traumatic cataract has occurred, even in patients well over twenty-five years of age. It is therefore advisable to wait for twelve months, before proceeding to extraction.

Illustrative Case.—Removal of foreign body from crystalline lens. Spontaneous absorption of traumatic cataract

W. A., aged 33 years, an underground fitter, complained on January 27, 1942, of dimness of vision in the left eye of six weeks duration. He had no recollection of injury. On examination, a

steel foreign body about the size of a pin's head was visible in the left crystalline lens, which was becoming opaque. Under local anaesthesia, a keratome incision was made superiorly. Iridectomy was performed and the foreign body was removed with an A.C. hand magnet. No lens substance escaped. On June 30, 1942, his name was provisionally put on the waiting list for extraction of cataract (left), "in about six weeks." On October 15, 1942, the cataract was mature but showed signs of shrinking, leaving a clear zone inferiorly. His name was crossed off the waiting list. On June 22, 1943, the left vision with plus 12.0 spherical was 6/18, and on February 15, 1944, with plus 13.0 spherical, 6/9.

Foreign bodies often go right through the eyeball and come to rest in the fascia bulbi. The prognosis is favourable in such cases. In searching for a wound of exit far back in the sclera, a small endoscope is of service.

Sites of election for incisions are posterior to the insertion of any of the rectus muscles. Temporary tenotomy (see Fig. 3) gives good access. When reunited, the muscle keeps the scleral wound from gaping. Unless vitreous is lost the scleral suture is withdrawn—not tied—lest it wrinkle the sclera, or predispose to infection.

Security of an intact fellow eye is the paramount consideration.

Conclusion

Ophthalmic skiagrams should be as informative as navigational charts.

Simple devices in connection with the treatment of intra-ocular foreign bodies have been described and illustrated.

ANNOTATIONS

The Lighting of Buildings

Ophthalmologists are sometimes consulted on problems which lie outside the limits of ordinary medicine and surgery, but which are important items of preventive medicine. They are often ill-equipped to answer the questions put to them; and in the hurly-burly of hospital and private practice they are scarcely to be blamed. It would be well, however, if some ophthalmologists at any rate would devote special attention to these subjects, which bid fair to loom larger in the future. One such is the lighting of buildings. A few ophthalmologists have indeed paid considerable attention to the lighting of schools. These alone realise the great complexity of the