OPHTHALMIC CASUALTIES RESULTING FROM AIR RAIDS

BY

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We are now becoming familiar with the types of ocular injury which result from air raids. They usually occur in conjunction with other injuries and are regarded as of secondary importance, particularly during the first few days of treatment. I have had the experience of preparing an ophthalmic hospital which was closed again before any emergency arose, and of starting from "scratch" immediately after a big air raid in a hospital unequipped for ophthalmic work. It has shown me that an ophthalmic hospital as such is impracticable except for protracted cases, and that the ophthalmic surgeon must be prepared to take his instruments and equipment to any centre where his services may be required. He may be met by a total absence of ophthalmic nursing and a lack of appreciation of the importance of vision in a patient who has multiple other injuries. These difficulties can be overcome, but I mention them in the hope that those who are in charge of E.M.S. hospitals will bear them in mind. The provision of ophthalmic drugs, a skeleton set of instruments, and the inclusion on the staff of one or two nurses with ophthalmic training would greatly facilitate matters. If possible some provision should be made for the ophthalmic surgeon to operate elsewhere than in the main theatre, since the latter is likely to be occupied continuously by general surgeons for several days after a raid.

Types of Injury

There appear to be three main causes of ocular injury: (1) explosive incendiary bombs; (2) the sudden compression and expansion of the atmosphere caused by blast; (3) direct blows on the eye.

The resulting injuries present certain features and problems of treatment which are new to the ophthalmic surgeon, and an outline of my observations on approximately 100 cases may therefore provide an interesting comparison for ophthalmic surgeons in other large cities. These notes were made after the raids in October and November, 1940, and have been modified by further experience.

Effects of Incendiary Bombs

In a mild degree the effect of an incendiary bomb was that of multiple foreign bodies—particles of sand and oil were embedded in the eyelids, conjunctivae, and corneae. Whenever possible the foreign bodies were removed from the cornea immediately, flavine oil and atropine was instilled, and when only one eye was affected the patient was able to return home: the eye usually became quiet in one or two weeks.

There were, however, many cases in which the eyes had been burned, and usually both eyes were affected. The lids and conjunctivae swelled, and the corneal epithelium was too oedematous to admit of removal of the foreign bodies for perhaps a week. The patients suffered severe pain and had to be removed to a base hospital, where they made a slow recovery. It was found by experience that metycain and merthiolate ointment gave great relief in the initial stages, without any ill effects on the cornea. Atropine was also administered, and, later, saline lotion and collosol argemum drops were employed. It was found better to remove the foreign bodies a few at a time. In one case in which a large number were removed from both corneae a week after

injury an alarming infection followed within forty-eight hours; there was a general rise in temperature, and a corneal abscess and hypopyon developed in both eyes. Large doses of sulphapyridine were given, followed by graduated intravenous injections of protein-shock T.A.B. Both eyes were retained; one had 6/12 vision, but in the other there was a perforated cornea.

I was impressed by the softening of all the ocular tissues. In addition to the softening of the cornea I noticed a persistent oedema of the conjunctiva; sutures put into flaps to cover a perforating injury very quickly cut out, and many cases showed lymphatic blebs in the conjunctiva which persisted for weeks after the injury. The sclera, too, appeared to be oedematous, for two cases in which deep burn penetrated to the sclera, developed a spontaneous rupture, and prolapse of the vitreous several days after injury. Secondary infection was rare, but in one case a most intractable attack of superficial punctate keratitis occurred. The resulting vision was usually good, except in the few cases with infection of the cornea, but the eyes remained irritable and injected for many weeks, and there was permanent staining of the conjunctivae.

In addition to the injuries already described, incendiary bombs often caused burns of the eyelids and face which were usually superficial and which were best treated with sterile petroleum jelly. This facilitated the dressing of the eyes and retained the mobility of the lids.

In contrast to these, deep burns of the eyelids occurred in conjunction with extensive burns of the face in firemen and A.R.P. workers directly exposed to fire. The eyes themselves were usually uninjured, and this enabled the gentian violet-silver nitrate treatment to be used in the first instance, followed by petroleum jelly when the lower lids became softened by lachrimation. Contraction was very apt to occur, and necessitated stitching the eyelid margins. After three months two cases were treated successfully with Thiersch grafts.

Effects of Blast

Some peculiar effects on the eye of sudden compression and expansion of the atmosphere were noticed: (a) Proptosis due to a sudden retrobulbar haemorrhage causing immediate total loss of vision: the usual signs of evulsion of the nerve were absent, yet subsequent optic atrophy occurred. (b) Extensive intra-ocular haemorrhage either from an iridodialysis in which the iris vessels were torn through, or from a torn retinal vessel. (c) One or more ruptures of the choroid appearing as crescentic tears near the optic disks; these were quite different from the familiar contusion changes of the retina and were accompanied by small haemorrhages at the macula, with loss of central vision. (d) Acute iritis and acute secondary glaucoma occurred in several cases about a week after injury. These were slow to recover. Investigations were made for any constitutional factor, but they appeared to be due entirely to trauma.

Effects of Direct Blows

Perforating injuries of the cornea and rupture of the sclera from a direct blow were common injuries, and usually the eye had to be removed. Several cases showed a severe traumatic keratitis with multiple folds in Descemet's membrane. Although the cornea cleared well there were always associated contusion changes in the retina, particularly at the macula, giving rise to defective vision. Several cases of penetrating wounds of the orbit occurred in which large particles of wood and glass were buried deep in the tissue; but the sinuses healed up well, as did wounds of the eyelids. There were no cases of intra-ocular foreign bodies requiring the use of the magnet.