

## An unusual complication of perforating wounds of the eye

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**Abstract.** In two patients, after a perforating wound of the eye, a cilium was found in the vitreous. In the first patient one end of a cilium was stuck in the retina, the other end floated freely in the vitreous of the right eye. During a 5-year follow-up no inflammatory signs were observed. Visual acuity remained 1.0. In the second patient a large metal foreign body was removed from the vitreous of the left eye immediately after the injury. A week later, while parsplana vitrectomy was being performed for a vitreous haemorrhage caused by the trauma, an eyelash was discovered in the vitreous, but it could not be removed. During the follow-up period, which included the removal of a traumatic cataract, the eyelash caused no inflammatory reaction. A year later the visual acuity of the left eye was 1.0. In the literature 17 reports were found of cases with one or more eyelashes in the posterior segment of the eye. In 5 cases this was discovered on clinical examination. Once the eyelash was spontaneously extruded from the bulb, once panophthalmia developed after the injury. In 3 cases the eye could be saved, twice with useful visual acuity, in spite of retention of the eyelash.

### Introduction

The presence of an intraocular cilium is fairly rare and has received a good deal of attention in the literature. After the (probable) first report in 1835, many publications on this subject have appeared (Duke-Elder, 1972). The eyelash is usually found in the anterior chamber, often stuck at one end in the cornea, iris or chamber angle (Cowen, 1942; Sharpe, 1925; Webster Fox, 1928). In a number of cases more than one cilium was found, in one case as many as fourteen (Duke-Elder, 1972; Klien, 1945). The infrequent occurrence is illustrated by the following figures:

5 cases among 30,000 patients between 1891 and 1893: Müller in Vienna, 1894 (as cited by Duke-Elder, 1972)

3 cases among 143, 471 patients: Popov in Rostock and Astrakhan, 1941 (as cited by Duke-Elder, 1972)

2 cases among 374, 721 patients in 15 years: Sitchevska and Payne in New York, 1949.

Even more uncommon is the occurrence of cilia in the posterior chamber (Savin, 1936), the lens (Byrnes, 1949), and the posterior segment of the eye. Literature study revealed 16 such cases between 1868 and 1974. On one occasion two hairs from the eyebrow were found in the vitreous.

### Survey of literature on cilia in the posterior segment

- 1868 Manz: through a perforating wound an eyelash reached the vitreous via the iris and the equator of the lens. Examination about a year after the injury showed turbidity in the vitreous but no other signs of inflammation.
- 1874 Sattler: after a perforating injury 3 eyelashes were lying with one end in the corneo-scleral wound and with their  $\pm 6$  mm long other end in the vitreous. They were removed via the wound.
- 1883 Makrocki: corneo-scleral perforating wound with a small vitreous prolapse. In the wound the end of an intraocular cilium was visible, it was removed from the wound.
- 1884 Lapersonne and Vassaux: 25 years after a perforating injury from a shot, the eye, which was blind and painful, was enucleated. Pathological examination showed that the eye had been perforated twice by the shot and that several eyelashes were embedded in the strand of scar tissue connecting the points of entrance and exit of the shot.
- 1890 Deutschmann: on pathological examination of an eye, which had been enucleated on account of severe injury from a metallic splinter, a cilium, surrounded by giant cells, was encountered in the vitreous.
- 1892 Webster: found two cilia attached to shot removed from the vitreous. The eye was lost through purulent iridocyclitis.
- 1893 Treacher Collins: pathological examination revealed 3 cilia in an eye that had been injured by a stab with a knife.
- 1894 Wintersteiner: pathological report on an eye that was enucleated on account of a severe inflammatory reaction following a perforating shot wound which had led to immediate blindness. An eyelash was found in the vitreous, embedded in fibrin, erythrocytes and leucocytes.
- 1901 Quint: by an injury with a crooked nail 2 eyebrow hairs landed in the vitreous, with one end in the wound in the posterior pole, about 3 disc diameters temporal to the macula. There was no inflammatory reaction and the eye was saved – visual acuity 5/10.
- 1902 Kraisky: report of a case where a cilium was found in the vitreous.
- 1907 Lang: spontaneous expulsion of a cilium from the vitreous, 8 weeks after a perforating injury.
- 1908 Warnecke: pathological report on an eye which was enucleated 4 weeks after a double perforation with a knife on account of increasing signs of inflammation. A cilium was found in the vitreous, embedded in the scar tissue at the point of exit.
- 1921 Wagenmann: 2 cases in which an eyelash was stuck to a foreign body which was extracted from the vitreous.
- 1931 O'Brien: pathological examination of an eye enucleated 8 days after trauma on account of panophthalmia. An eyelash had been seen in the vitreous before enucleation, on pathological examination it was seen to be surrounded by giant cells.

1951 Saryev (cited by Duke-Elder, 1972): report of eyelash in vitreous.

1974 Kozart, Yanoff and Katowitz: after a perforating injury 2 eyelashes and a metallic foreign body were embedded in the retina. One eyelash and the foreign body were removed. The second eyelash did not give rise to an inflammatory reaction. The visual acuity remained 10/10.

In our clinic we twice saw patients with an eyelash in the vitreous.

### **Patient A**

In 1979 the right eye of a 13-year-old boy was injured by a piece of iron-wire, which produced an irregular perforating wound of the cornea. On examination the anterior chamber was seen to have been maintained. The iris was perforated at 8 o'clock and a small bubble of vitreous had prolapsed into the anterior chamber. The lens was clear, although its edge had just been touched. In the fundus, at 8 o'clock near the equator, an area was seen with retinal oedema and pre-retinal blood in the vitreous. Visual acuity was 0.6. The presence of a metallic foreign body could be ruled out by radiodiagnosis and the use of the Berman Locator.

The edges of the corneal wound were in good apposition and were not sutured. Therapy consisted of corticosteroids, local mydriatics and local and systemic antibiotics. Three days later the vitreous had cleared sufficiently to reveal a retinal defect. An eyelash was fixed by one end in the hole in the retina and the other end floated freely in the vitreous. The eyelash caused hardly any inflammatory reaction. The vitreous became clearer and the retinal oedema disappeared. In order to prevent a retinal detachment the defect was isolated by xenon coagulations. The patient left the hospital after 10 days. Visual acuity was 1.0. No inflammatory signs were seen in the weeks after discharge and this has remained so during the whole follow-up period of 5 years.

By a check-up after 5 years the visual acuity of the right eye was 1.2. There were no inflammatory signs in the anterior chamber or vitreous. The lens showed a slight traumatic cataract of the posterior cortex. In the fundus an atrophic scar was visible with the cilium fixed in it (see Figure 1). The cilium was depigmented but had retained its shape and size.

### **Patient B**

Our second patient is a 39-year-old carpenter. In 1983, when drilling in iron, he got a piece of iron in his left eye. On examination the visual acuity of the left eye was 1/60. There was an irregular incision in the sclera near the limbus at 10 o'clock. The anterior chamber was deep and full of blood and blood clot. The pupil was round, but no more could be seen because of the hyphaema.

Localization photographs showed a metallic foreign body in the vitreous.

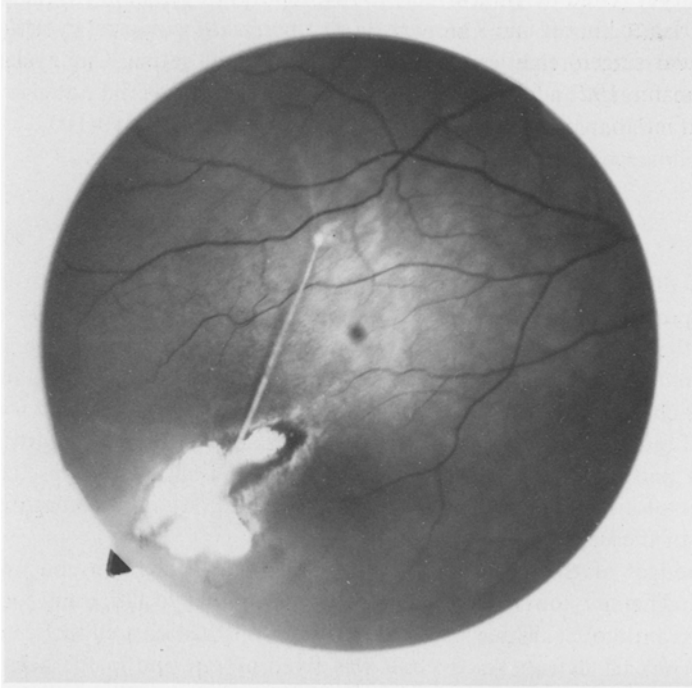


Figure 1. Patient A, 5 years after perforating injury. A cilium with one end in the scar in the retina and the other end in the vitreous.

The patient was anaesthetised and the left eye was explored surgically. An approximately 5 mm long foreign body could be removed with a magnet. After the operation the anterior chamber cleared and the lens was seen to be clear. The vitreous was full of blood. A week after the accident a pars plana vitrectomy was performed; during the operation an eyelash was sucked behind the iris at 8 o'clock and it was not found possible to remove it. Post-operative recovery was satisfactory, without any noticeable inflammatory reaction. About a month after the accident a retinal defect, which was probably due to the foreign body striking the retina at this point, was isolated by laser coagulation. In the months which followed a traumatic cataract developed. Extracapsular cataract extraction was performed with the implantation of a posterior chamber lens. At a check-up more than a year after the accident the visual acuity of the left eye was 1.0. The eye was pseudophakic and there were no signs of inflammation in the anterior chamber or vitreous. Nasally, just behind the iris and partially hidden by it, the eyelash was visible. It had become a little paler in colour.

#### **Aetiology**

An eyelash can enter the eye if it is passively carried in when a perforating

injury occurs. The perforating object can be found in the eye together with the eyelash, or it can have been removed leaving the eyelash behind. During intraocular surgery they can also be carried into the anterior part of the eye (Wagenmann, 1921).

The fact that an intraocular eyelash is so seldom found in a perforating wound can probably be explained by the fact that the reflex closure of the eyelids does not occur until after the foreign body has entered the eye, so that it misses contact with the eyelashes. Only on rare occasions will the foreign body just skim along the eyelashes or the eyelids be closed at the moment of the injury.

### Clinical course

The fate of eyes with intraocular cilia cannot be predicted. Sometimes the eye becomes infected, a severe inflammatory reaction takes place and a hypopyon is formed. The disappearance of this inflammatory reaction after the removal of the eyelash has been described (even before the era of antibiotics) (Wagenmann, 1921).

If the eyelash is not infected it can remain in the eye for a long time without causing a severe inflammatory reaction. There are many reports in the literature of eyelashes which were tolerated without problems in the anterior chamber, until as long as 34 years after the trauma (Duke-Elder, 1972; Gradle, 1923; Hughes, 1924; Rubey, 1966).

An inflammatory reaction can however occur, beginning weeks to years after the trauma (Duke-Elder, 1972; Henneberg, 1926; Sharpe, 1925; Sitchevska and Payne, 1949). This can manifest itself as chronic iridocyclitis or a granulomatous inflammatory process (Duke-Elder, 1972; Klien, 1945; Lang, 1907; O'Brien, 1931). This may disappear after the removal of the eyelash, but may also make enucleation necessary (Cowen, 1942; Klien, 1945; Savin, 1936; Sharpe, 1925; Sitchevska and Payne, 1949).

The formation of serous and pearl cysts has also been described, probably resulting from proliferation of the epithelium of the follicle or sheath of the eyelash (Duke-Elder, 1972; Sitchevska and Payne, 1951; Wagenmann, 1921). Sympathetic ophthalmia has been reported in two cases (1841, Cunier and in 1864, von Graefe).

Cases have also been described where expulsion of the eyelash from the eyeball occurred. The cilia can also undergo changes, such as bleaching and splitting (Duke-Elder, 1972).

The following reports were found on eyelashes in the posterior segment of the eye. In 5 cases one or two eyelashes were found in the posterior segment on clinical examination:

- in one case spontaneous expulsion occurred;
- in one case the eye had to be enucleated on account of panophthalmia;
- in 3 cases the eye could be saved (twice with useful vision).

In 4 cases eyelashed could be removed from the eye directly after trauma because one end was situated in the wound or because they were attached to the foreign body which was extracted.

In 6 cases eyelashed were found unexpectedly on pathological examination after enucleation (once in an eye which was enucleated 25 years after trauma). In these cases giant cells were frequently found around the eyelash.

### Therapy

In view of the variable outcome of the spontaneous development of the condition it is difficult to give an all-round answer. The chance that the eyelash will remain inertly present is good, but the tendency to inflammatory reactions and the formation of cysts must also be taken into consideration. The risks of surgical removal of the eyelash must be weighed against the risk of inflammation.

It would seem sensible to remove cilia which are surgically easily accessible.

### Conclusion

In 2 cases an eyelash was found in the vitreous after a perforating injury. During the follow-up period of 5 and 1 year respectively, slow depigmentation was observed. To our surprise panophthalmia did not occur, although one may assume that eyelashes are bacterially contaminated. Nor did we observe any reaction to the eyelash itself, or to substances which may be released by disintegration of this organic material. The remarkably uneventful clinical course and the infrequent reports of such cases in the literature led us to make this publication.

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