IRIS CYST TREATED BY ELECTROLYSIS*

BY

WILLIAM WILSON

Ophthalmic Institution, Glasgow

CYSTS of the uveal tract have been classified clinically as congenital, parasitic, exudative or degenerative, traumatic implantation, and spontaneous or idiopathic (Duke-Elder, 1940). There is considerable overlap between the last two groups and many cases which one suspects of being traumatic in origin give no history of injury.

The tissue forming the cyst in traumatic cases has been implanted either as an island or by active ingrowth of epithelium along the tract of a penetrating wound and may appear as a pearl tumour or as a serous cyst. The former is solid and greyish-white with walls formed of stratified or cuboidal epithelium, the innermost layers of which as a rule degenerate to produce a fluid rich in fat globules and cholesterol crystals. A foreign body may be present in the lesion. The serous cyst is the more common form and may arise a few weeks or perhaps not for many years after the injury. It has a relatively thin wall of ill-developed or irregular epithelium and contains a yellowish or slightly turbid fluid.

Congenital cysts of the iris are rare and may be pigmented or unpigmented. Some observers claim that all spontaneous cysts of the iris are congenital and that their apparently late appearance is due to sudden rapid dilatation leading to a rise in tension, but according to Mann (1937) this cannot be taken as certain.

A diagnosis of spontaneous cyst of the iris is usually made only when all other causes have been eliminated. It may occur in the stroma or between the two epithelial layers in the posterior surface of the iris and may be pigmented or unpigmented. Stromal cysts occur mainly in young persons, 50 per cent. before 10 years of age and two-thirds before 20 years (Duke-Elder, 1940), which suggests that they may be congenital in type. After having been quiescent for years, they may suddenly start to grow and give rise to glaucoma.

Various theories have been put forward to account for them. It was suggested that the unpigmented were mesoblastic cysts derived from iris endothelium, but Wolfrum (1915) has shown that the human iris has no endothelium. Mann (1937) favoured the idea that the unpigmented cysts, like the pigmented ones, are formed from the neural ectoderm of the rim of the optic cup, but at a much earlier age before it is fully pigmented. More recently, Politzer (1953) has reported histological findings on sections from four human embryos having small vesicles springing from the anterior border of the optic cup. The author thinks it likely that these may contribute to the formation of spontaneous iris cysts.

* Received for publication May 15, 1963.

Various forms of treatment have been employed in dealing with iris cysts none of which has been consistently successful. Surgical excision is favoured by most writers. Duke-Elder (1940) states that the treatment of choice is complete excision in an iridectomy, and that if this cannot be achieved as much as possible should be excised and the eye treated with radiotherapy.

Scheffler (1955) recorded a case of epithelial implantation cyst of the iris in a young man aged 19 years who gave a history of injury as a child. The cyst was removed by iridectomy and the inner wall was found to consist of a layer of epithelium three to four cells thick.

Simmonds (1960) recorded a stratified squamous cyst which he excised after it had been punctured and the contents evacuated. He had treated the cyst by electrolysis on three previous occasions but it had always recurred.

Radnót and Kuhár (1959) described how an iris implantation cyst, which occurred after a penetrating injury near the limbus, was removed through a corneal flap cut by a 6-mm. trephine. This method was preferred to a limbal incision because of the danger of puncturing the cyst.

Vail (1954) quoted Verhoeff as saying that, in three cases in which he was fairly certain that he had not been successful in removing the entire cyst, there was no recurrence. In such cases he thought it well to attempt to remove the cyst even if one did not succeed in excising all the epithelium, as he believed the eye could safely harbour a certain amount of it. It is possible that, as a result of the operation, the epithelium was incarcerated in scar tissue so that it did not proliferate. In support of this, Guerry and Wiesinger (1957) recorded a case of spontaneous iris cyst in a girl aged 3 years which was partially excised through a keratome incision. Although only the anterior two-thirds was excised, only tags remained 2 years later.

X-ray therapy alone or after incomplete surgical removal is also advocated in treating cysts of the iris and the anterior chamber and post-operative epithelial cysts. It has a number of advantages over surgery and is frequently the only possible type of treatment. Early x-irradiation of serous cysts of the iris is regarded as the method of choice by Sviadosch and Turchenko (1959).

Treatment by aspiration followed by injection of irritant chemicals has also been advocated. Wright (1925) aspirated an iris cyst, then injected phenol, and then with a second needle irrigated the cyst wall with saline. Alger (1932) preferred a solution of iodine and Spaeth (1948) mentioned a 50 per cent. dextrose solution as the sclerosing agent. Other substances have been used but the technique is fraught with danger should the fluid escape through the cyst wall into the anterior chamber.

Electrolysis has been used in the treatment of iris cysts for many years. Thilliez (1908) thus treated a cyst filling two-thirds of the anterior chamber using a current of 2 ma. for 2 minutes. The cyst disappeared but recurred 6 months later. The treatment was repeated and the cyst was then cured.

A large transparent cyst of the iris was successfully treated with electrolysis by Chaillous (1914) when it had recurred after incomplete surgical removal.

Kennedy (1956) described six cases of iris cyst, five of them following cataract extraction, which were treated successfully by electrolysis. Simmonds (1960) found that, even after repeated treatment with electrolysis, an iris cyst recurred and had to be removed surgically.

Šafář (1935) used electrocoagulation, puncturing the cyst wall with a needle and passing a current of 35 ma. for 10 seconds. Unfortunately, in one of his cases, secondary glaucoma followed after 18 months and the eye had to be enucleated.

Vail (1954) described three iris cysts treated by multiple puncture with a diathermy needle using a current of 10–35 ma., but suggested that electrolysis might eventually prove to be the safest and most effective therapy. I wish to endorse this statement by describing such a case.

Case Report

A railway signalman aged 36 years first attended the out-patients department in March, 1962, complaining of redness of the left eye in which he had noticed a "black mark" 10 days previously.

Examination.—The visual acuity of the right eye was 6/5 and N5 with -0.5 D sph., and of the left eye 6/5 and N5, with -1 D sph., and -1.5 D cyl., axis 180° .

The "black mark" was a thin-walled cyst of the left iris in the six o'clock position (Fig. 1). The cyst, which measured 6 mm. across and 2 mm. high, appeared to push the iris tissue aside rather than to invade it. The anterior wall came forward into the anterior chamber and touched the posterior corneal surface below, while the posterior wall reached the edge of the lens and the zonular fibres which were easily seen through the cyst walls. The cyst had three loculi and the partitions appeared as white ridges on the anterior wall with pigment on the posterior wall. The left pupil reacted normally but when dilated was oval in shape. There was no evidence of uveitis, the lens was clear, and no abnormality was seen in the left fundus.

FIG. 1.—Left eye, showing iris cyst.

The right eye was normal in every respect.

The intra-ocular pressure was normal in both eyes.

The patient gave no history of injury and x-ray examination showed no intra-ocular foreign body. General examination revealed no abnormality. The blood Wassermann reaction was negative.

The patient was kept under observation and 2 months later the cyst had enlarged to 7.5 mm. across and 3 mm. high. When he was admitted for treatment it had enlarged still further.

Treatment.—Under local anaesthesia a fine electrolysis needle was passed through the limbus of the left eye in the 6.30 meridian and, as the anterior cyst wall touched the cornea, passed directly into the cyst where it could be seen. A current of 1.5 ma. was passed and the cyst filled with hydrogen bubbles. When bubbles appeared in the anterior chamber the needle was withdrawn. The cyst was seen to shrink immediately. Atropine and "Neocortef" drops were instilled and the eye covered with a pad.

On the following day the collapsed anterior cyst wall was easily seen and there was slight oedema of the lower half of the cornea although the intra-ocular pressure was normal. The corneal oedema cleared over the next 2 days.

Progress.—2 months later there had been no change and the treatment was repeated to the collapsed cyst, after which the remains of the cyst wall could be seen only with the gonioscope.

Over the next 2 months, however, the cyst reformed at a greatly increased rate until it measured 11 mm. across and 2 mm. high. The treatment was repeated and one week later a further dose was given. The gonioscope showed slight blood staining in the collapsed wall of the cyst and the iris was tented up towards the puncture wound at the limbus.

Result.—Fibrosis has continued over the past 8 months and there is now no evidence of the cyst on gonioscopy. The angle of the anterior chamber is closed below and the pupil is pear-shaped. Slight corneal scarring remains where the cyst and posterior corneal surface were in close apposition (Fig. 2).

FIG. 2.—Left eye after treatment.

Discussion

The principle of electrolysis is the production of hydrogen and base at the cathode which is the active electrode. The white bubbles of hydrogen and protein are acted upon by ions of sodium and potassium and a caustic action is produced. This method is therefore one of chemical destruction of tissue. Increasing the current increases the rate of production of the caustic materials.

There was no history of injury in this case yet the cyst appears to have been traumatic in origin. Well known to all ophthalmologists is the fact that a perforating wound of the eyeball can be sustained with minimum discomfort to the patient, with no obvious wound and no marked reaction in the injured eye. In a right-handed person the injury caused by a needle or similar sharp instrument will most frequently occur in the lower part of the left eyeball as in this case.

The simplicity of treatment by electrolysis and the lack of reaction in the treated eyeball suggest that it is worthy of trial in many cases of iris cyst in the first instance. The treatment may require to be repeated several times but this is an easy matter. The only reaction in this case was localized, transient corneal oedema. A rise in intra-ocular pressure has also been recorded (Simmonds, 1960), but this was easily controlled by miotics and Diamox.

Summary

A case of serous cyst of the iris is described. It is suggested that the cyst was traumatic in origin despite the absence of a history of injury. Repeated electrolysis was successfully employed in treatment, the remnants of the cyst being finally incarcerated in the scar tissue so formed.

I wish to acknowledge the assistance of Prof. W. J. B. Riddell in the treatment of this case. The photographs were taken at the Eye Department of the Western Infirmary, Glasgow, by his kind permission.

REFERENCES

- ALGER, E. M. (1932). *Arch. Ophthalm. (Chicago)*, **7**, 984.
 CHAILLOUS, M. J. (1914). *Bull. Soc. franç. Ophthalm.*, **31**, 450.
 DUKE-ELDER, S. (1940). "Text-book of Ophthalmology", vol. 3. Kimpton, London.
 GUERRY, D., and WIESINGER, H. (1957). *Amer. J. Ophthalm.*, **44**, 106.
 KENNEDY, P. J. (1956). *A.M.A. Arch. Ophthalm.*, **55**, 522.
 MANN, I. (1937). "Developmental Abnormalities of the Eye". Cambridge.
 POLITZER, G. (1953). *v. Graefes Arch. Ophthalm.*, **153**, 497.
 RADNOT, M., and KUHÁR, G. (1959). *Klin. Mbl. Augenheilk.*, **134**, 313.
 ŠAFÁŘ, K. (1935). *Z. Augenheilk.*, **86**, 31.
 SCHEFFLER, M. M. (1955). *Amer. J. Ophthalm.*, **39**, 76.
 SIMMONDS, N. T. (1960). *Ibid.*, **50**, 334.
 SPAETH, E. B. (1948). "Principles and Practice of Ophthalmic Surgery", 4th ed. Lea and Febiger, Philadelphia.
 SVIADOSCH, B. I., and TURCHENKO, I. A. (1959). *Vestn. Oftal.*, **38**, No. 2, p. 25.
 THILLIEZ, E. (1908). *Bull. Soc. franç. Ophthalm.*, **25**, 490.
 VAIL, D. (1954). *Amer. J. Ophthalm.*, **38**, 513.
 WOLFRUM, M. (1915). *v. Graefes Arch. Ophthalm.*, **90**, 471.
 WRIGHT, R. (1925). *Brit. J. Ophthalm.*, **9**, 454.