THE BRITISH JOURNAL
OF
OPHTHALMOLOGY

NOVEMBER, 1923

COMMUNICATIONS

CASE OF IMPLANTATION CYST OF IRIS AND
CILIARY BODY

BY

W. BARRIE BROWNLIE, M.D., F.R.C.S., (Edin.)

BLACKBURN

With Pathological Report

BY

HUMPHREY NEAME, F.R.C.S.

LONDON

THE patient, a girl aged 10 years, was first seen at the Out-patient Department of the Blackburn and East Lancashire Royal Infirmary on March 15, 1922. The father, who brought the child, stated that about two months previously, the girl began to complain of pain in the left eye and tended to keep the eye closed. On inspection of the eye at that time he noticed "a small black spot behind the edge of the sight" in the situation of the present tumour. Since then this spot had gradually increased in size.

On inspection the condition was obviously a cyst of the iris practically occupying the whole of its lower and temporal quadrant except for 1.5 mm. of normal iris from the pupillary edge. The anterior wall of the cyst was flush with the back of the cornea in its outer two-thirds. The wall presented a practically continuous convex contour inwards at its "free edge." The cyst walls being

thin and transparent the posterior wall appeared bluish-black in colour. This colour was taken to be the pigmented layer of the iris and gave the whole cyst a bluish-black colour.

The conjunctiva in the vicinity of the cyst presented the appearance that one usually associates with the condition seen after an advancement of the external rectus of recent date, viz., striation and slight hyperaemia of the deeper conjunctival layers and underlying muscles. The conjunctiva covering the rest of the eyeball was normal. Inquiry on this point elicited the fact that, ten months previously, this eye had been operated on for squint at another hospital, from which it was ascertained later that tenotomy of the internal rectus with advancement of the external rectus had been done. Since this operation the eye had had recurrent attacks of slight watering and irritation, but no marked

symptoms had been present till two months before coming to the Out-patient Department as stated above.

Further inspection of the eyeball over the site of the advancement showed two small round black spots in the sclera, the upper spot (I—see drawing) being smaller and less well defined than the lower. It was situated just below the horizontal meridian and 3 mm. from the limbus. The lower spot (II—see drawing), 2 mm. from the limbus and 0.5 mm. in diameter, was a definite gap in the sclera. Over the lower spot the conjunctiva was slightly oedematous in appearance, not unlike that seen over the usual trephine opening in glaucoma. These spots are indicated only fairly well in the drawing.

The pupil of the left eye was active to light and accommodation, being of the same size as that of the right eye, although slightly "pushed in" at the position adjacent to the cyst. The tension, media, and fundus of the eye were normal. Hypermetropic glasses were worn, with glasses R.V.=6/9 (not improved) and L.V.=6/60 (not improved). A fair degree of internal concomitant strabismus of the left eye was present.

As the child had some pain and the cyst was evidently growing, removal of the latter was advised. In view of the probable variety of the cyst—implantation, following intraocular puncture by a needle through one or both of the two spots noted above—a possibility of recurrence was hinted at, also that of subsequent enucleation.

The first operation was performed on March 31, 1922, commencing with a limbal section with a Graefe knife, adjacent to, and to the extent of the size of the cyst. As the anterior cyst wall was in contact with Descemet's membrane, limbal puncture was naturally followed by rupture and total collapse of the cyst, when the whole iris assumed an apparently normal appearance so that one had to judge roughly how much iris had to be removed. This was done after the manner of a glaucoma iridectomy—a radial cut from pupil edge to iris base above, tearing the iris from its base to the completion of the iridectomy below.

For two months the eye looked very well, then a recurrence of the cyst was noticed commencing from the region of the ciliary body behind the coloboma and growing forwards and inwards. The cyst enlarged with the anterior and inner wall forming a somewhat lobulated appearance and pressing the pillars of the iris coloboma against the back of the cornea.

Towards the end of August, 1922, the cyst had now come anterior to the plane of the coloboma and enucleation of the eye was advised. The parents, however, wished another conservative operation to be tried. Obviously, there was not much hope of success by any method of approach through the anterior chamber owing to the now obvious deep seated location of the cyst, so it was decided to try a trephine operation over the site of the lower scleral gap (II—see drawing) in the faint hope of possible healing following collapse of the cyst and subsequent drainage.

The second operation was done on September 29, 1922. Before this was commenced, a syringe with a fine needle was passed easily through the lower spot (No. II) when its point was noticed from the anterior chamber to be in the interior of the cyst showing its external origin in a purely mechanical manner. Suction with the syringe at this point caused the cyst to collapse somewhat, and a few drops of slightly yellow watery fluid were drawn into the syringe. After reflection of the conjunctiva and scar tissue a large trephine (2.5 mm.) was placed over the site (No. II). After removal of the scleral disc the definite cyst wall was brought into view, picked up with iris forceps and removed to the whole extent of the trephine hole. A small gush of fluid followed. The cyst was completely emptied as far as one could ascertain. The conjunctiva was not replaced over the trephine

hole which was left open. There was no loss of vitreous, although one was working at least 3 mm. behind the limbus. This was evidently due to the fact that the cyst was comparatively large, so that one could put the trephine over its outer wall without injuring the ciliary body or anterior choroid. The trephine opening closed in a little over a month from the second operation, despite attempts to keep it open by repeated introductions of an iris repositor.

By January 1, 1923, the recurrence was as extensive as it had been immediately before the second operation. Although the occurrence of sympathetic ophthalmia was not likely to happen, as iridocyclitis did not follow either of the previous operations, enucleation of the eye was again advised. As the eye was amblyopic to the extent of 6/60, and subsequent glaucoma and loss of the whole eye was likely to occur, no other course was left open.

The eye was removed on January 19, 1923.

Comments

It must be the experience of many in operating for advancement, especially in earlier operations, to perforate the sclera completely with the needle. One recognizes the mishap by the "feel" of the suture after counter-puncture, and thus one is able to put matters right with no resultant harm. At the same time, who will say conscientiously that he has never left a suture in the deep ciliary region, or even deeper? One must remember that the sclera at the age at which most advancements are done is very thin, and in these cases early operation is being practised probably more at the present day than it was ten years ago. What is more important than too deep a bite of the needle is to avoid a tag of conjunctiva being drawn into the needle hole by the suture, the remedy being to undercut the conjunctiva sufficiently and hold it well out of the way of the suture. That some such accident happened in this case was in all probability the cause of the loss of the eye.

A case of implantation cyst of the sclera following a similar operation has been described by Goulden and Whiting (*Trans. Ophthalm. Soc.*, Vol. XLI, 1921, p. 316) with a full and excellent description of cases of scleral cysts collected from literature. We are also familiar with the fact that implantation cysts of the cornea and iris are not unknown after penetrating injuries of the eyeball. So far this is the first case that one has come in contact with, or seen described in literature, where the iris and ciliary body alone were involved after an advancement operation and, fortunately, this type of case must be very rare.

Pathological Report.—(*R. Lond. Oph. Hosp.*, Curator's No. 1560)

The specimen was received in Bouin's fluid on January 20, 1923. The eyeball, frozen in the usual way, was divided obliquely downwards and outwards in three parts. The plane of division cut the corneo-scleral junction at the middle of the temporal side and at a point at the junction of the middle and lower thirds of the inferior temporal quadrant below. The central portion included between the two planes of section contains the greater part of the cyst of ciliary body and iris.

Macroscopic. The section of the frozen eye shows—as in the stereo-photographs (Fig. 1)—a shallow anterior chamber, with a narrow angle on one side, and on the opposite side (down and

Fig. 1.

Stereo-photograph of anterior part of divided eyeball. (Middle portion of eyeball seen from above.) The cyst is seen to occupy the position of the anterior part of the ciliary body and of the root of the iris. This cut surface corresponds with drawing (Fig. 3).

out) a cyst situated at the anterior end of the ciliary body encroaching on the root of the iris which, at the site of this section, is pressed forwards against the cornea. The cyst has a smooth partly pigmented lining, and a delicate ridge on the anterior wall.

Microscopic. The greater part of the cyst-bearing portion was embedded in celloidin. 160 serial sections cut. Stains:—Haematoxylin and eosin and Weigert's iron haematoxylin and van Gieson's picric acid fuchsin stain.

Low power. Cornea—normal. Anterior chamber shallow, with root of iris on superior nasal side only separated from the ligamentum pectinatum by a very narrow cleft. On the inferior temporal side the angle of the chamber and the site of the iris are

occupied by a thin walled cavity (Fig. 2). Sections which pass through the cyst nearer to one of its extremities, and not through its middle part, show complete absence of periphery of iris (coloboma of operation), and adhesion of divided edge of iris firmly to deep surface of cornea *i.e.*, the pillar of iridectomy carried forward against cornea by re-formed cyst (Fig. 3). Sections through the central part of the cyst show absence of iris, except for small collections of pigment cells flattened out between the

Fig. 2.

Micro-photograph—magnification $\times 4$. Anterior part of eye, section viewed from below. The cyst is seen entirely to replace the iris, as this section is near the central portion of the cyst, at the site of the coloboma of the iris.

The micro-photographs are by Mr. G. WELCH.

cyst and the cornea here and there in some of the sections. These represent, probably, small tags of iris—or of flattened iris previously incorporated in the cyst wall—which remained in contact with the cornea after the operation of iridectomy or trephining. Through a portion of the serial sections can be traced the remnants of the fistula of the trephine operation. In none does there remain evidence of a draining fistula. The outer part of any such fistula is obliterated by young fibrous tissue (collagen fibre, stained red by van Gieson's picric acid fuchsin stain). The inner part is represented by a pouch, the

most prominent part of which is shown in micro-photograph (Fig. 4, section No. 8 in the series—i.e. 80th section). This pouch projects outwards and backwards from the cyst, and from

Fig. 3.

Drawing of sections taken from the upper part of the middle portion of the eye. The iris root is seen to be absent and the iris edge (pillar of coloboma) is firmly attached to the posterior corneal surface. *a*=iris, *b*=cornea, *c*=pillar of iris attached to cornea, *d*=cyst cavity, *e*=ciliary processes stretched out upon the posterior surface of the cyst, *f*=ciliary body.

Fig. 4.

Micro-photograph—magnification $\times 200$. Above and to the right is part of the ciliary body; below is the cornea and corneo-scleral junction. The diverticulum projecting into the corneo-scleral junction is all that remains of the trephine opening.

that part of its wall at the corneo-scleral junction. The lens is displaced up and to the nasal side by the cyst. Vitreous, retina, and choroid in situ.

Examination with Zeiss A objective and No. 4 E.P., and by Zeiss D objective and 4 E.P. The cyst wall where it is blended with the cornea consists of an inner lining of epithelial cells, from 1 to 5 or 6 cells in thickness. At the thinnest part these cells are elongated, flattened and not typical of epithelium, but at the thickest part—corresponding in position with the delicate ridge projecting on the inner surface and seen on examination of the divided eyeball with a $\times 8$ loupe—the cells are decidedly epithelial

Fig. 5.

Micro-photograph—magnification $\times 400$. Above: five to eight layers of epithelial cells lying on the posterior surface of the cornea, and lining the cyst.

in type (see micro-photograph, Fig. 5). Elsewhere, in the free cyst wall and in contact with the ciliary body, the lining is of 1 to 3 cells in thickness. At the corneal side of the cyst, the outer layers of the cyst are of spindle-shaped cells and a few collagen fibres, which blend with new fibrous tissue in the scar of the operations and with the substantia propria. The posterior part of the cyst wall is formed of epithelial lining, spindle-shaped cells and a few collagen fibres, and greatly extended ciliary processes and some pigment cells derived from ciliary processes or iris. The thinnest part of the wall is that directed towards the centre of the anterior chamber. It is here composed of one or two layers of much flattened lining cells, a very thin collagen fibre layer, and scanty spindle-shaped cells. It is impossible to

decide whether these spindle-shaped cells are connective tissue cells or very flat endothelial cells.

Conclusion

The situation and direction of the long axis of the cyst suggest that the needle, carrying the suture for the inferior of three sutures for advancement of the rectus muscle, was passed too deeply and traversed the anterior part of the ciliary body at its junction with iris root and pectinate ligament (A in drawing, Fig. 7). It is assumed that the suture was passed tangentially to the limbus

Fig. 6.

The double arrow indicates the situation and approximate extent of the cyst.
x and y = the probable points of entry and exit of needle.

Fig. 7.

(To illustrate the text.)

(as X—Y, Fig. 6). It is hardly conceivable that the implantation of conjunctival epithelium at B would result in the extension of a cyst into the ciliary body and root of iris. Implantation in the canal of Schlemm or in the pectinate ligament might possibly result in the formation of such a cyst. It is impossible to be dogmatic as to the exact site of origin of the cyst owing to the disturbance of the parts resulting from the successive operations performed in the hope of curing the condition.

The order of events was presumably as follows:—

1. A cyst was formed in the anterior part of the ciliary body and root of iris and projected forwards in the anterior chamber—as seen clinically.

2. Operation of iridectomy removed a sector of iris with greater part of cyst, but the root of the cyst at anterior region of ciliary body and root of iris remained. The open edges of the cyst came into contact, fused and the cyst re-formed and gradually enlarged. The pillars of the coloboma became opposed to the deep corneal surface and there adhered.

As the cyst re-formed, it extended from the ciliary region *behind* the adherent pillars of the coloboma or perhaps was instrumental in pushing these pillars forwards against the cornea. It carried with it, as it enlarged, ciliary processes on its deep or posterior surface (see drawing, and stereo-photograph, Figs. 3 and 1).

The trephine operation merely sufficed to remove a small portion of the anterior cyst wall. The edges of this opening would almost inevitably approximate one to the other on the collapse of the cyst, and quickly heal together.

As the cyst was again re-formed by secretion of fluid by its lining epithelium, the wall of the cavity was pushed a short way into the trephine opening at the corneo-scleral junction (as seen in a small number of the serial sections). The remainder of the trephine opening became sealed with fibrous tissue, as there was no leakage of fluid to keep it patent.

INTRA-CISTERNAL INJECTIONS IN THE TREATMENT OF LUETIC OPTIC ATROPHY*

BY

SANFORD R. GIFFORD

FROM THE DEPARTMENT OF OPHTHALMOLOGY, UNIVERSITY OF NEBRASKA
MEDICAL COLLEGE, OMAHA, NEBRASKA, U.S.A.

It requires no little temerity to approach the subject of luetic atrophy, especially from the point of view of its treatment. For we were taught to believe that so-called simple luetic optic atrophy is a progressive disease, practically unaffected by treatment, and running its course to blindness in nearly every case. I believe that this view is still accepted by a large number of clinicians, as it was by us, until an experience with one patient led us to reconsider the subject, and to try out certain lines of treatment on a series of similar cases.

The experience was as follows:—Case I. Mr. H. 48 years old, a banker, had been taking anti-syphilitic treatment for the past fifteen years. He stated that his blood Wassermann had

* Read at the Oxford Ophthalmological Congress, July 6, 1923.