PARTIAL IRIDOCYCLECTOMY AND SCLERECTOMY*

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THE following description of a patient with a malignant melanoma of the iris and ciliary body and two episcleral pigmented nodules (Fig. 1) is of interest because of the possibility of combining partial iridocyclectomy with resection of an area of overlying sclera 12×7 mm. and the successful replacement of this outer ocular tunic defect with a free corneal graft.

Case Report

A man aged 46, had for 30 years a brown spot on the nasal side of the iris in the left eye. Recently this pigmented area had grown and two brown flecks had appeared on the sclera (Fig. 1). The visual acuity was 6/6, with 1.25D sph. The patient had declined to have this eye excised.

FIG. 1.—Photograph of malignant melanoma of the iris of the left eye and two episcleral pigmented nodules.

FIG. 2.—Diathermy needle circumvallation of bulbar conjunctiva wide of two pigmented episcleral nodules. Traction suture in medial rectus muscle.

Operation.—On March 2, 1965, the bulbar conjunctiva on the nasal side was circumvallated with a diathermy needle, carrying a coagulating current 4 mm. wide of the two episcleral pigment spots, with the intention of preventing any vascular or lymphatic spread of neoplastic cells during surgical manipulations (Fig. 2).

Preparation.—The area of bulbar conjunctiva within the circumvallation was later removed *en bloc* with the 12×7 mm. area of sclera over the ciliary body. The bulbar conjunctiva was then incised just peripheral to the diathermy circumvallation and the incision was extended round the limbus to 12 o'clock and 6 o'clock. From each end radiating incisions 8 mm. long were made posteriorly. The conjunctival flap was undermined for about 12 mm. and the flap reflected posteriorly by sutures clamped to the head towel (Fig. 3, opposite).

The medial rectus muscle was divided in advance of two mattress sutures of 5/0 chromic catgut; this is an important step in assisting the reduction of intra-ocular pressure and in preventing scleral compression when the eye is held in lateral rotation by traction sutures in the superior and inferior rectus muscles to effect a position in which the area of operation lies uppermost.

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FIG. 3.—Posterior edge of free corneal graft 12×7 mm. sutured to posterior scleral incision. Through the anterior corners of the graft are passed sutures to each corresponding end of the corneal limbal incision. Central sutures are placed in the anterior edge of the graft and in the corneal limbal edge. The scleral flap 12×7 mm. is resected and about to be removed. The neoplasm in the iris and ciliary body is exposed.

Incision.—The limbus was incised for 12 mm. from 7 to 11 o'clock through a little over half its thickness and radiating cuts 7 mm. long were made from each end of this limbal incision also through a little over half the thickness of the sclera. The posterior limits of the radiating incisions were joined by an incision concentric with the limbal incision and about $\frac{1}{4}$ of the scleral thickness.

Corneal Graft.—A pattern of transparent oiled silk was taken of this quadrilateral area of sclera and laid over a donor cornea for cutting a free graft 12×7 mm.

The convex posterior edge of the corneal graft was sutured to the posterior scleral incision by interrupted 5/0 white silk sutures placed at 1 mm. intervals. Through half the thickness of each anterior corner of the graft and then through half the thickness of each end of the limbal incision, 6/0 black silk sutures were passed with a substantial stay-knot drawn flush with the surface of the graft (Fig. 3) and clamped in fine curved mosquito pressure forceps.

Then through half the thickness of the centre of the anterior edge of the corneal graft and through half the thickness of the limbal incision, 6/0 black silk sutures were passed. The suture in the graft was stained with methylene blue to identify its track later in the operation. These two sutures were clamped in curved bull-dog clips, which were used for lifting the cornea and for reflecting the graft.

Sclerotomy for Vitreous Aspiration.—Over the pars plana to the medial side of the superior rectus insertion surface, diathermy was applied and the sclera incised for 2 mm. down to the supra-choroidal lymph space. A 5/0 white silk suture with a stay-knot was inserted for closure of the sclerotomy incision.

Scleral Resection.—The scleral incisions were then deepened to the supra-choroidal lymph space. When this line of cleavage was reached, completion of the scleral incision was effected without risk of injuring the ciliary body by passing Herbert's sclerotomy knife on the flat through the scleral incision into the supra-choroidal space, and finally turning the blade at a right angle so that the cutting edge was forward. With a lifting and sliding movement the incision was completed. Several such manoeuvres were required to complete the three scleral incisions.

The limbal incision was dealt with last. The anterior chamber was entered on either side of the neoplasm and at the angle between the limbal and scleral incisions. Then the central suture in the corneal edge of the limbal incision was lifted, Herbert's knife was passed on the flat into the filtration angle and used thus to separate the ciliary body from the scleral spur, and finally turned with the cutting edge forward to complete the depth of the limbal incision.

The quadrilateral of sclera with the overlying bulbar conjunctiva containing the two diathermy circumvallated episcleral pigment nodules was lifted away from the ciliary body (Fig. 3). The deep surface of the excised sclera at the limbus showed a curved line of pigment over the canal of Schlemm (Fig. 4).

FIG. 4.—(1) Deep surface of the excised quadrilateral of sclera with a line of pigment over the canal of Schlemm. (2) Excised part of ciliary body with neoplasm.

Partial Iridocyclectomy.—As seemed possible the extent of the malignant melanoma was larger in the ciliary body than in the iris (Fig. 3). Posterior to the neoplasm there were several dilated blood vessels in the pars plana of the ciliary body. Surface diathermy was applied to the ciliary body 4 mm. wide of the neoplasm, 40 ma for 3 seconds. This circumvallation procedure effected a bloodless field through which the cyclectomy was done (and has indeed not failed to achieve this in 24 partial cyclectomy operations so far done). Because of the greater risk of vitreous bulging on the nasal side than elsewhere, and because of the necessary large area for partial cyclectomy, it seemed a justifiable precaution to aspirate 0.25 ml. vitreous through the sclerotomy over the pars plana on the medial side of the superior rectus insertion. This was done and the sclerotomy temporarily closed pending replacement of the vitreous near the end of the operation.

For iridocyclectomy it is well for the surgeon to be facing the sector for excision, for by so doing he is able to see the plane between the face of the intact hyaloid membrane and the ciliary processes (Fig. 5). The cornea was lifted clear of the neoplasm by forward traction on the central suture, and that part of the iris unaffected by the neoplasm and near the pupil margin was seized in curved-plane iris forceps and drawn towards the ciliary body without making contact with the cornea. When the iris with the neoplasm was withdrawn from the eye it was lifted forward and radial cuts were made from the pupil margin to the iris root 3 mm. wide of the neoplasm on either side of it. Then, with a slight forward lift and posterior rotation of the iris forceps, the plane of cleavage between the hyaloid membrane and the ciliary processes was seen and one blade of Castroviejo's curved synchiotomy scissors was introduced in this plane for 3 mm. on one side of the diathermized zone of the ciliary body, the other blade of the scissors being outside the ciliary body. The blades were then gently rotated and lifted a little so that the cutting edges were engaged in the ciliary body and were closed (Fig. 5, opposite).

A like procedure was done on the other side in the diathermized zone. As the freed part of the ciliary body with the neoplasm was lifted and rotated posteriorly, the fibres of the suspensory ligament were divided. Further cuts about 3 mm. long were made with the above technique until excision of the neoplasm was complete. Then the lateral sutures, with posterior stay-knots passing through each corner of the free corneal graft and the limbus, were drawn taut and the central graft and limbal sutures were crossed over to cover the exposed hyaloid membrane.

The central suture in the corneal graft was then withdrawn, and the needle of the central limbal suture was passed into the methylene blue-stained track of the former and tied. Then the stay-

FIG. 5.—Scissors incision through diathermized zone of ciliary body as seen by the surgeon seated on the temporal side.

FIG. 6.—Photograph taken a little over 4 months after operation.

knot of one corner suture was withdrawn 1 cm. and cut off and the suture was tied. A like procedure was followed with the other corner suture.

Interrupted 5/0 chromic catgut sutures were then inserted at 2 mm. intervals to secure the edges of the free corneal graft and the radial scleral incisions, and further sutures were inserted on either side of the central limbal suture.

Replacement of Aspirated Vitreous.—The suture closing the sclerotomy over the par plana at the medial edge of the superior rectus insertion was loosened to admit the needle for the replacement of 0.25 ml. of aspirated vitreous, and was then drawn taut and tied on removal of the needle.

Injection of Sterile Air into the Anterior Chamber and Conjunctival Flap.—A bent needle attached to a syringe with sterile air was inserted into the anterior chamber at one corner of the limbal incision and when the tip of the needle was between the iris and the posterior corneal surface air was injected quickly to reform the anterior chamber.

The undermined conjunctival flap was brought forward to cover the free corneal graft and the limbal incision.

Pathological Report.—Sections through the neoplasm (Fig. 4) confirmed the clinical diagnosis of spindle-celled malignant melanoma of the iris and ciliary body. The line of excision was well clear of the neoplasm. Some pigmented spindle cells were seen in the filtration angle of the excised 12 × 7 mm. quadrilateral of sclera.

Post-operative Course.—This was uneventful. There was no intra-ocular haemorrhage, and no sign of cyclitis. The lens was clear and for one month the corneal transplant remained so clear that the vitreous and edge of the lens could be seen.

Result.—On July 16, 1965 (a little over 4 months after operation), the corneal graft had become semi-opaque but was more translucent in some places than others (Fig. 6). The lens had a sheet of greyish exudate adherent to the anterior capsule just below its centre. Intra-ocular pressure 25 mm. Hg (Schiötz). Visual acuity 6/18 with -0.5 D sph., + 5 D cyl., axis 100°, and N 6.