ENUCLEATION OF EYES POSSIBLY CONTAINING MALIGNANCIES*†

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THE difficulties of the differential diagnosis between haematomata under the retinal pigment epithelium, degenerative diseases of the macula, and malignant melanomata of the choroid have often been pointed out (Reese and Jones, 1961). These problems have troubled many an eye surgeon and their solution will not be discussed here, but a modification of the usual method of enucleation to be used when removing an eye possibly containing a malignant tumour is described below.

In these cases the implantation of any type of metal, glass, or plastic ball into the muscle cone is contraindicated, but if subsequent study of the enucleated eye shows that there is no probability of a recurrence, an implant may be inserted at a later date. To facilitate such delayed implantation and also to inspect thoroughly the muscle cone at the time of the enucleation it is advisable to secure the tendons of the four recti muscles. Otherwise these will contract after severing and become difficult to find when needed later to supply motility for a secondary implant.

The early steps of this modified enucleation do not differ from the typical procedure: After incision of the conjunctiva along the corneal limbus and exposure of the recti muscles using blunt curved scissors, three muscles—usually the inferior, temporal, and superior—are caught with a strabismus hook in the usual manner. Before severing the tendons, a black 4-0 double-armed silk or nylon suture is introduced into each of the two outer thirds of each tendon. While an assistant holds the suture away from the scissors, the surgeon severs the tendon in the usual way. The needles are then led through Tenon's capsule and out of the conjunctiva, about 1 cm. away from the conjunctival incision; the ends of the threads are knotted but are not cut until after inspection of the muscle cone. It may be advantageous to put over each needle a small glass bead about 1 mm. in diameter which should remain in the tissue to prevent the muscle from shrivelling and to make it easier to find later when an implant is to be inserted (Fig. 1, opposite). The bulbar insertion of the fourth tendon, usually the nasal, should be left longer for easy grasp by the enucleation forceps; the tendon should be sutured to

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FIG. 1.—Two glass beads are sutured to the tendon to make it easier to locate the muscle at a later procedure.

FIG. 2.—Suture and retractors are used for thorough inspection of the muscle cone.

Tenon's capsule and to the conjunctiva before the optic nerve is severed. After removal of the eyeball and cessation of bleeding, two assistants pull the four muscles apart—up, down, temporally, and nasally—so that the surgeon can thoroughly examine the muscle cone (Fig. 2). This is particularly indicated when inspection of the sclera or optic nerve reveals the presence of suspicious tissue, in which case a subsequent implant must not be considered. It will not be discussed here what should be done in the presence of suspicious masses; in their absence, however, the conjunctival wound can be closed with a continuous 5-0 silk or chromic gut suture. During this procedure, the nasal and temporal muscle sutures may be used to keep the lips of the conjunctival wound exposed. The upper and lower muscle sutures may be shortened before, and the nasal and temporal after suturing the conjunctiva. An antibiotic ointment may be instilled. A dressing with slight pressure is applied and should remain over the lids for 3 to 4 days. However, the patient can be discharged earlier if no complication arises.

This method can also be used in preference to the classical procedure on old, debilitated patients who should not be subjected to long surgery and to prolonged hospital stay. Better motility of the prosthesis can be expected

by the described anchoring of the muscles to the conjunctival sac and to Tenon's capsule. In these cases, the glass beads may be omitted since later search for the muscle tendons is not contemplated.

Similar procedures to achieve better motility of the prosthesis were suggested in the late 19th and early 20th century. Schmidt (1897) contended that the prosthesis did not move properly after the usual enucleation because of retraction of the severed muscles; he therefore secured the recti muscles with catgut sutures, inserted 0.75 cm. behind the conjunctival wound. Priestley Smith (1899) sutured the recti muscles to the conjunctiva 10–12 mm. behind the corneal limbus after grasping each muscle through the conjunctiva with toothed forceps; similar precautions were suggested by Pflüger (1900) and by de Schweinitz (1900). For the same purpose, Kuhnt (1907, 1916) introduced the needle from outside into the conjunctiva, through the muscle, which was elevated by a strabismus hook, and out again through the conjunctiva. Valois and Rouveix (1916) sutured at least the temporal and medial rectus muscles to the conjunctiva. Sattler (1922) found little advantage in suturing the recti to the conjunctiva during enucleation. Chouquet (1900) and Terrien (1902) advised against suturing the recti muscles to the conjunctiva, claiming that this procedure reduced the motility of the prosthesis. Meyer (1898) stressed the necessity to spare as much as possible the natural connexions between muscle, conjunctiva, and Tenon's capsule. None of these authors, however, aimed at a better inspection of the muscle cone during surgery or at easier recovery of the muscles when an implant was to be introduced as a later procedure.

The inspection of the orbit after enucleation has been regarded as a problem; Hutchinson (1866) wrote that "the optic nerve is usually cut through close to the sclerotic. Should it be found afterwards that the part left behind is diseased, the excision of another portion is by no means an easy operation. . . . Passing the forefinger deeply into the orbit, the nerve trunk can, with a little care, be discovered. A pair of strongly toothed forceps may then be guided down and made to seize the nerve trunk at any distance from its end which may be thought desirable . . ."

Stallard (1958) mentioned lifting and drawing apart four sutures inserted into the recti muscles 3 mm. behind their insertion, not, however, for the purpose of inspection of Tenon's capsule or the muscle cone, but to insert gauze for haemostasis.

Summary

A modified enucleation procedure is described which will enable the surgeon to inspect thoroughly the muscle cone after the removal of an eye possibly containing a malignant tumour. It helps to identify the recti muscles during a later procedure if the pathological examination reveals absence of malignancy and an implant is to be inserted.

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