Block Excision of Tumors of the Anterior Uvea

Report on 68 Consecutive Patients

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Purpose: This study describes the authors' surgical technique and the results in 68 consecutive patients with tumors of the iris and ciliary body involving the angle removed by block excision and tectonic corneoscleral grafting between 1980 and 1995.

Patients and Methods: There were 41 (60.3%) women and 27 (39.7%) men whose ages ranged from 14 to 85 years (median, 41 years). Follow-up ranged from 0.5 to 15.2 years (median, 6.3 years). Tumors of the iris and ciliary body with chamber angle involvement were removed with a modified block excision consisting of simultaneous en bloc removal of the tumor with adjacent iris and cornea and sclera in full-thickness. The resulting defect of 6 to 20 mm (median, 9.0 mm) diameter is covered with a tectonic corneoscleral graft.

Results: Forty-nine tumors (72.1%) were classified as malignant tumors of the iris and ciliary body. Twenty-one (44.7%) of 47 malignant melanomas showed histologic evidence of scleral invasion of more than one third of scleral thickness. Extrascleral extension of the tumor was present in seven (14.9%) patients with malignant melanomas and in four (21.1%) patients with benign tumors of the iris and ciliary body. The 10-year survival probability of patients with malignant melanomas was 91.4%. The main intraoperative complication was vitreous hemorrhage in 24 (35.3%) patients, and the main postoperative complication was complicated cataract, occurring in 22 (32.3%) patients. Two local tumor recurrences (2.9%) were observed. Four eyes (5.8%) had to be enucleated after block excision. Best-corrected postoperative visual acuity was better than 20/60 in 36 (52.9%) patients.

Conclusion: The authors' results indicate that block excision with tectonic corneoscleral grafting may be the treatment of choice for progressive circumscribed tumors of the iris and ciliary body involving the anterior chamber angle up to 150° of its circumference.
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The purpose of every treatment of expanding uveal tumors should be (1) the prolongation of life or increased survival, (2) the complete eradication of the intraocular tumor tissue and, if possible, (3) the preservation or retention of sight in the affected eye. The obvious options for small- and medium-sized lesions are sector iridectomy for iris tumors not involving the chamber angle[1–5] and brachytherapy for choroidal and posterior ciliary body tumors.[6–11] Large uveal tumors not susceptible to uvectomy and brachytherapy or proton beam irradiation[9] are still treated by enucleation.[12–16]

Uveal tumors involving the anterior chamber angle represent a selected minority; their treatment is particularly controversial.[17–32] Radiation therapy of large tumors of the ciliary body may be complicated, aside from radiation cataract, by rubeosis iridis with ensuing irreversible secondary angle closure glaucoma.[7,8]

Local resection of selected cases of circumscribed ciliary or even choroidal tumors may offer an alternative in the management of such patients. Many surgical tech-

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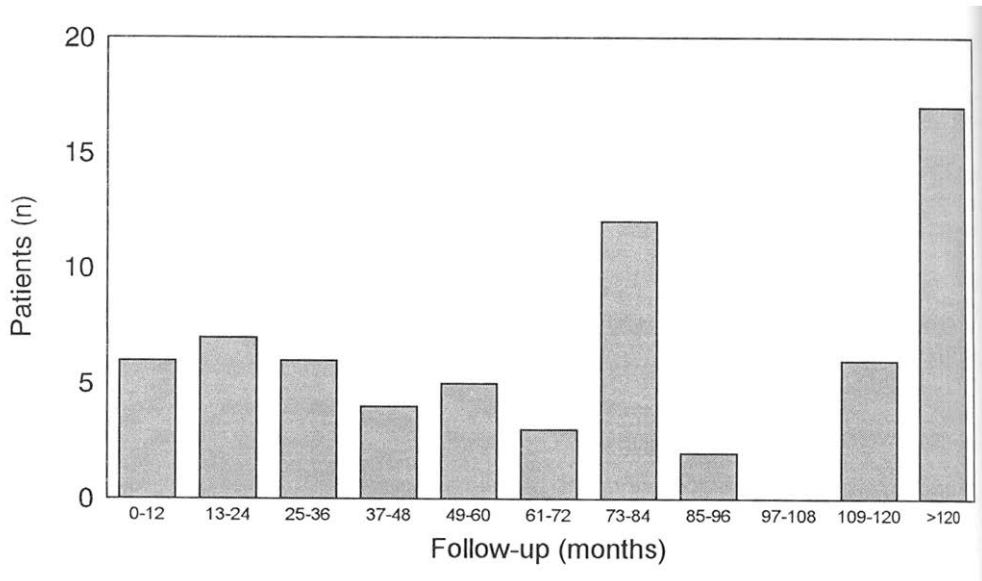

Figure 1. Follow-up of 68 patients with tumors of the anterior uvea.

niques have been reported for such tumors since Zirm[33] introduced iridocyclectomy, Schubert[34] introduced choroidectomy, and Foulds et al[35,36] and Shields and colleague[10,29,30] introduced partial lamellar sclerouvectomy. However, these surgical techniques represent local en bloc excisions under the preserved superficial lamellar scleral flap. Ninety percent of malignant melanomas of the uvea invade the sclera histopathologically.[37] Thus, the risk remains of local tumor recurrence originating from malignant tumors cells left inside the scleral flap. We therefore used a more radical surgical approach, thereby removing the tumor together with all the adjacent full-thickness cornea and sclera in one block (i.e., block excision).[17–25,28]

In this article, we describe our current surgical technique and the results of 68 consecutive patients with tumors of the anterior uvea involving the chamber angle structures treated by block excision and tectonic corneoscleral grafting.

Patients and Methods

Patients and Patient Selection

In a prospective, nonrandomized study, 68 consecutive patients referred with circumscribed tumors of the iris and ciliary body involving the angle (from a total of 113 patients) were treated with block excision and tectonic corneoscleral grafting between July 1980 and September 1995. Forty-five patients were not included in the study because of the following:

1. There was clinical evidence of diffuse tumor growth (29 patients).
2. The tumor was too large for local excision (12 patients).
3. Patients declined surgery (3 patients).
4. Preoperatively, there was clinical evidence of metastatic disease (1 patient).

The operation always was performed by one surgeon (GOHN). Patients were selected for block excision after a thorough ocular and systemic examination (liver ultrasound, determination of serum liver enzymes, and chest x-ray). Local resection was considered as treatment of choice if:

1. The tumor was circumscribed.
2. Biocytology[23,38] had shown no evidence of intraocular tumor cell seeding.
3. The tumor was located in the iris or ciliary body or both involving the chamber angle structures by not more than 150° (5 clock hours) of the circumference of the pars plicata of the ciliary body.
4. The tumor had no evidence of retinal invasion or vitreous seeding.

Clinically and histopathologically,[13,39–42] we recorded the largest tumor diameter in contact with the sclera, the tumor thickness, and the tumor location (iris with chamber angle involvement; ciliary body with iris involvement; ciliary body with choroidal involvement; and iris, ciliary body, and choroidal involvement). Follow-up data were obtained from the clinical charts of our Department of Ophthalmology, University of Erlangen-Nürnberg, or from the referring ophthalmologists.

We generated Kaplan–Meier[43] survival curves for deaths due to metastatic uveal melanoma. We treated time-to-death from other causes and time-to-follow-up for living patients as censored times in the data analysis. For the evaluation of visual loss after local resection, we generated Kaplan–Meier survival curves for the endpoints of visual loss to be 20/60 or worse and 20/200 or worse. To determine those variables most highly associated with visual loss, we used the Cox proportional hazards model.[44] Stepwise regression techniques were used to fit several models involving the selection of the variables: (1) preoperative visual acuity, (2) largest tumor diameter, (3) preoperative irradiation, (4) location (iris, ciliary body, or both), (5) intraoperative or postoperative