Eye wall resections for intraocular tumors: Our experience

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We conducted a retrospective review of 11 eyes undergoing eye wall resection between October 1998 and October 2009. The median age of 11 patients was 29 years. Decreased vision (eight) was the most common presenting symptom. Ciliary body medulloepithelioma was the most common clinical diagnosis (six). Medulloepithelioma was the most common histopathological diagnosis (four). The duration of follow-up ranged from 0.5 to 67 months (median 11 months). Three eyes needed to be enucleated in the postoperative period (margin involvement two eyes, recurrence one eye). Postoperative complications among others included retinal detachment (three), vitreous hemorrhage (three), cataract (two), and suprachoroidal hemorrhage (two). To conclude, prognosis of this procedure continues to be guarded needing close postoperative follow-up.

Key words: Eye tumor, eye wall resection

Management of ciliary body tumors is a challenge. Enucleation is the most common management modality. Other modalities include brachytherapy, transpupillary thermotherapy, and local tumor resection. Numerous studies have suggested that local excision might be attempted in cases of small well-circumscribed tumors.

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We hereby share our experience of 11 eyes of 11 patients who underwent eye wall resection. This is the first reported series of this management modality from the Indian subcontinent.

Materials and Methods
The patients who underwent eye wall resection between 1998 and 2009 at our center were identified. Retrospective review of these cases was done. The data collected included age, gender, symptoms, signs, best-corrected visual acuity, and intraocular pressure. A note of clinical diagnosis, intraoperative procedures, and postoperative histopathological diagnosis was made. The surgical procedure was performed under hypotensive general anesthesia. After transillumination (to delineate tumor margins), a partial thickness posteriorly hinged scleral flap was raised 3 mm beyond the margins starting from the limbus. Diathermy was performed to the edge of the resection bed. En bloc excision of the tumor was performed through the limbal route. The scleral wound was closed using 8-0 Vicryl, while the corneal wound was closed using 10-0 nylon. In case of vitreous loss, vitrectomy was performed after limited wound closure. Details of postoperative sequelae, procedures, and follow-up duration were noted. IOP and visual acuity were also noted if recordable.

Results
11 patients, of which 5 were males, had undergone eye wall resection at our hospital. The age of the patients varied between 2 and 42 years (median 29 years). Decreased vision was the most common symptom (eight eyes), followed by pain (three eyes) and watering (two eyes).

Corneal examination revealed band shaped keratopathy and endothelial pigmentation in one eye each. Five eyes had iris cysts and two had neovascularization of iris. One eye each had mass in angle, neovascularization of angle, and peripheral anterior synaechiae. Four eyes had retrolenticular membrane.

Ciliary body medulloepithelioma [Fig. 1] was the most common clinical diagnosis (six eyes), followed by melanoma and iris cyst (two eyes each) and melanocytoma (one eye).

Medulloepithelioma was the most common histopathological diagnosis (four eyes), followed by leiomyoma and melanoma (two eyes each). Epithelial cyst, juvenile xanthogranuloma and melanocytoma [Fig. 2] comprised one case each.

Additional procedures included vitrectomy in two eyes, lensectomy (one eye), encirclage (one eye), endolaser photocoagulation (two eyes), silicone oil infusion (one eye), C3F8 injection (one eye), cyst removal (one eye), and endocryotherapy (one eye).

The follow-up duration ranged from 0.5 to 67 months (median 11 months). Three eyes needed to be enucleated in the postoperative period (margin involvement two eyes; recurrence one eye). Postoperative complication included RD (three eyes), vitreous hemorrhage (VH) (three eyes), hypotony (three eyes), cataract (two eyes), suprachoroidal hemorrhage (two eyes), and raised IOP (one eye).

Discussion
Numerous studies have evaluated the outcome of eye wall resection.\[1,3-8\] Most of the eyes in these studies had uveal melanoma.\[3,4,6,7\] Our study, although of a smaller sample size, assessed the outcome over a wider variety of tumors [Tables 1 and 2]. Damato et al. have shown that both eye and vision can be preserved in nasally located tumors and those not extending to within 1 disc diameter (DD) of the fovea or optic disc.\[8\] 57% of such eyes had a visual acuity better than 6/12 at the last follow-up. Gunduz et al. had reported that the mean pre- and postoperative visual acuity at the last follow-up remained stable.\[6\] We found that the final visual acuity improved in one eye having an epithelial iris cyst and was stable in one case each of leiomyoma and medulloepithelioma. All the other eyes had a worsening of visual acuity. Large tumor (≥16 mm) diameter, posterior tumor extension to 1 DD of the fovea, presence of epitheloid cellularity, and lack of adjunctive plaque therapy are the risk factors for recurrence of tumors after eye wall resection.\[1\] The average number of clock hours of tumor...
involvement in a related study was 3.5 which was similar to that of our study (3.6 clock hours). The average tumor dimension in that study was 12.9 × 10.4 × 8.5 while that in our study was 8.55 × 5.57 × 2.9 mm. The lesser dimension could be explained by means of shorter duration of follow-up as well as the tumors being predominantly restricted to the ciliary body. None of our cases underwent adjunctive plaque radiotherapy. The rate of postoperative enucleation due to recurrence ranges from 0 to 15% in various series. Our study had three eyes undergoing enucleation (one recurrence and two margin involvement). This proportion of cases needing enucleation due to recurrence agrees favorably with the literature. Two of the four cases of medulloepithelioma in our series needed enucleation.

The choice of eye wall resection compared with plaque radiotherapy is an unresolved question. A retrospective comparative study comparing the outcomes of transscleral resection with that of I-125 plaque brachytherapy found better outcomes in terms of visual acuity and glaucoma in cases undergoing transscleral resection. Shields et al. preferred plaque radiotherapy in eyes with larger tumor thickness, juxtapapillary and subfoveal lesions while Damato et al. preferred eye wall resections.

**Conclusion**

Eye wall resection may help salvage a few eyes with ciliary body tumors.

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