

Eye wall resections for intraocular tumors: Our experience

*Tandava Krishnan, Lingam Gopal, Jyotirmay Biswas¹,
Prema Padmanabhan², Vikas Khetan*

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

Shri Bhagwan Mahavir Vitreoretinal Services, ¹L & T Ocular Pathology Services, ²Cornea and Ocular Surface Disorder Services, Sankara Nethralaya, Chennai, Tamil Nadu, India

Correspondence to: Dr. Vikas Khetan, Shri Bhagwan Mahavir Vitreoretinal Services, Sankara Nethralaya, 18 College Road, Chennai – 600 006, Tamil Nadu, India. E-mail: drvk@snmail.org

Manuscript received: 19.03.11; **Revision accepted:** 10.01.12

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.^[1] Other modalities include brachytherapy, transpupillary thermotherapy, and local tumor resection^[2-7] Numerous studies have suggested that local excision might be attempted in cases of small well-circumscribed tumors.^[3,4,6-8]

Access this article online

Quick Response Code:



Website:

www.ijo.in

DOI:

10.4103/0301-4738.98823

Presented in part at the All India ophthalmological Conference 2011 and was adjudged the best paper in the Retina/Vitreous session

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 synechiae. 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

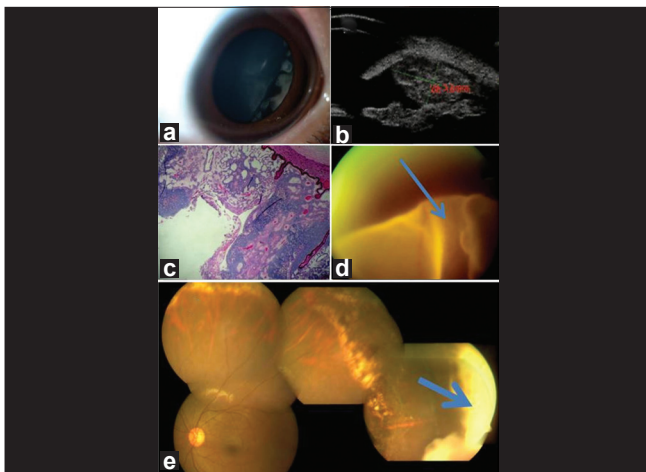


Figure 1: (a) Ciliary body mass is noted, (b) UBM showed cystic mass, (c) Basophilic mass with heteroplastic elements suggestive of teratoid medulloepithelioma was noted, (d) Giant retinal tear (arrow) was noted postoperatively and operated, (e) Tumor recurrence (arrow) necessitated enucleation

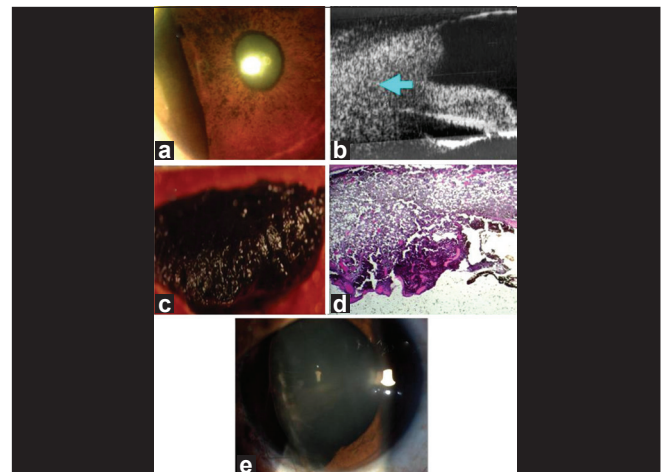


Figure 2: (a) A brownish mass is seen in the angle, (b) Ultrasound biomicroscopy showed a solid ciliary body mass, (c) Histopathology revealed a pigmented mass showing polyhedral cells (d) with rounded nuclei suggestive of melanocytoma, (e) Picture of the eye after surgery

Table 1: Eye wall resection for intraocular tumors- Patient details

Age/ gender	Visual acuity		Clinical diagnosis	Histopathological diagnosis	Follow-up (months)	Comments
	Before	Last visit				
29/M	6/36	6/60	Ciliary body medulloepithelioma	Benign teratoid medulloepithelioma	11	Hypotony
33/F	PL	NA	Ciliary body medulloepithelioma	Nonteratoid medulloepithelioma	1	Enucleation—HP involved margins
6/F	6/24	NA	Ciliary body medulloepithelioma	benign teratoid medulloepithelioma	36	Enucleation—recurrence after 13 months
22/M	6/36	6/12	Iris cyst	Epithelial cyst of iris	19	Cataract
2/F	Not recorded	Not recorded	Ciliary body medulloepithelioma	Nonteratoid medulloepithelioma	67	Prophylactic laser
32/M	6/9	6/18	melanocytoma	melanocytoma	61	Raised IOP
8/F	6/36	2/60	Iris cyst	Juvenile xanthogranuloma	17	RD + vitreous hemorrhage
16/M	6/9	6/12	Ciliary body medulloepithelioma	Leiomyoma	5	RD + vitreous hemorrhage
50/M	6/6	1/60	iris melanoma	Iris and ciliary body melanoma	2	Cataract
42/F	1/60	NA	Ciliary body melanoma	Ciliary body melanoma	0.5	Enucleation—HP involved margins
40/F	6/7.5	3/60	Medulloepithelioma	Leiomyoma	7	Prophylactic laser

PL: Perception of light, NA: Not applicable, HP: Histopathology, RD: Retinal detachment

Table 2: Comparative evaluation of different studies conducted on eye wall resection

	Damato <i>et al.</i> ^[8]	Devron Char <i>et al.</i> ^[3]	Shields <i>et al.</i> ^[7]	Gunduz <i>et al.</i> ^[6]	Present series
Number	163	138	95	22	11
Melanoma	163 (100%)	125 (90.5%)	81 (85%)	16 (72.7%)	2 (18.18%)
Enucleation	8	28a	15	0	3
Metastasis	22	NA	5	None	None
Follow-up (months)	28b	72	60	40.1	11

^aOut of the 28 eyes, 7 eyes had undergone enucleation due to tumor recurrence, ^bMedian follow-up. When not stated the follow-up period is deemed to be the mean follow-up

involvement in a related study was 3.5 which was similar to that of our study (3.6 clock hours).^[3] 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.^[1,3,7] 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. Medulloepithelioma are known to grow like a sheet thereby needing enucleation subsequently due to recurrence or residual tumor.^[9] Two related studies have described a rate of metastasis ranging from 5 to 13%.^[1,7] However, our study as well as the study by Gunduz *et al.* did not have any metastasis. This could be the result of smaller period of follow-up as well as a different tumor spectrum. The postoperative rates of cataract (18%), VH (27%), and RD (27%) in our series were within the range noted

in the previous studies, i.e., 15–50% for cataract, 9–83% for VH, and 28–30% for RD, respectively.^[3,6-8] Two of our cases were treated with prophylactic barrage LASER photocoagulation before eye wall resection and did not develop RD. Such a prophylactic therapy may offer some protection.

The choice of eye wall resection compared with plaque radiotherapy is an unresolved question. A retrospective comparative study comparing the outcomes of transcleral resection with that of I-125 plaque brachytherapy found better outcomes in terms of visual acuity and glaucoma in cases undergoing transcleral resection.^[2] Shields *et al.* preferred plaque radiotherapy in eyes with larger tumor thickness, juxtapapillary and subfoveal lesions while Damato *et al.* preferred eye wall resections.^[10]

Conclusion

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

References

1. Damato BE, Paul J, Foulds WS. Risk factors for residual and recurrent uveal melanoma after trans-scleral local resection. *Br J Ophthalmol* 1996;80:102-8.
2. Bechrakis NE, Bornfeld N, Zoller I, Foerster MH. Iodine 125 plaque brachytherapy versus transscleral tumor resection in the treatment of large uveal melanomas. *Ophthalmology* 2002;109:1855-61.
3. Char DH, Miller T, Crawford JB. Uveal tumour resection. *Br J Ophthalmol* 2001;85:1213-9.
4. Damato B, Foulds WS. Indications for trans-scleral local resection of uveal melanoma. *Br J Ophthalmol* 1996;80:1029-30.
5. Damato BE, Foulds WS. Ciliary body tumours and their management. *Trans Ophthalmol Soc U K* 1986;105(Pt 2):257-64.
6. Kurt RA, Gunduz K. Exoresection via partial lamellar sclerouvectomy approach for uveal tumors: A successful performance by a novice surgeon. *Clin Ophthalmol* 2010;4:59-65.
7. Shields JA, Shields CL, Shah P, Sivalingam V. Partial lamellar

- sclerouvectomy for ciliary body and choroidal tumors. *Ophthalmology* 1991;98:971-83.
8. Damato BE, Paul J, Foulds WS. Predictive factors of visual outcome after local resection of choroidal melanoma. *Br J Ophthalmol* 1993;77:616-23.
9. Shields JA, Eagle RC Jr, Shields CL, Potter PD. Congenital neoplasms of the nonpigmented ciliary epithelium (medulloepithelioma). *Ophthalmology* 1996;103:1998-2006.
10. Shields JA. Local resection of posterior uveal melanoma. *Br J Ophthalmol* 1996;80:97-8.

Cite this article as: Krishnan T, Gopal L, Biswas J, Padmanabhan P, Khetan V. Eye wall resections for intraocular tumors: Our experience. *Indian J Ophthalmol* 2014;62:517-20.

Source of Support: Nil. **Conflict of Interest:** None declared.