25 Gauge Endoresection for Moderate to Large Choroidal Melanoma

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Dear Editor

Choroidal melanomas are often managed by observation, brachytherapy, proton beam radiation, transpupillary thermotherapy and enucleation depending on the size and location of the tumor. Endovitreous resections have also been described for the management of moderate to large size tumors. Optimal therapy for uveal melanoma however still lacks consensus with current emphasis being primarily on preservation of globe and secondarily on preservation of vision.

We operated on three cases of choroidal melanoma with exudative retinal detachment with limited ocular disease (confirmed on Positron Emission Tomography scan) using 25 Gauge Constellation Vision System (Alcon Laboratories, Inc., Fort Worth, TX) (Table 1) Written informed consent was obtained from all patients after explaining the risks and benefits of the procedure.

The surgical technique consisted of core vitrectomy with posterior hyaloid separation and completion of peripheral vitrectomy including over the mass lesion. Subretinal fluid was drained from a superior retinotomy and posterior retina was stabilized using perfluorocarbon liquid (PFCL). Tumor mass was then photocoagulated on the surface using Purepoint® 532 nm laser embedded into the Constellation® Vision System and at margins to decrease the vascular supply and endoresection was performed from apex to scleral bed using a wide angle viewing system (Miniquad XL Contact Lens, Volk Optical, Inc, USA.). (Fig. 1) Intraoperatively, choroidal

bleeding was controlled by raising the intraocular pressure (IOP) to 80 mmHg at the time of resection and coinciding it with hypotensive anesthesia with mean blood pressure of 80 mmHg. Tumor cell dissemination was prevented using high suction of 600 mmHg and high flow rate of 40 ml/min. High suction was applied directly near the cutting edge of vitrector facing the tumor mass to aspirate all loose tumour cells. Cellular remnants at the scleral bed and upto 2 mm beyond the tumor margins were photocoagulated with high power (200–300 mW) of continuous-mode endophotocoagulation. PFCL was used in the end to provide short term retinal endotamponade, which was followed by Silicon oil- PFCL exchange at 10th day. Fluid from vitrectomy cassettes was sent for histopathological diagnosis immediately after surgery.

Globe preservation with complete resection of tumor could be achieved in all the cases. However, vision could be salvaged in two of three patients over a median follow up of two years (Fig. 2) (Table 1). Histopathology from vitrectomy fluid samples showed epithelioid variant of melanomas in all three cases. No intraoperative complications occurred in any of the patients and no recurrence was noted during the follow up with maximum of three years in first patient.

Various authors have described the endoresection of choroidal melanoma as an alternative globe preserving therapy with good outcomes and no significant increase in metastasis [1–5]. Caminal JM et al. have recently reported comparable outcomes in plaque radiotherapy and endoresection for choroidal melanoma in terms of metastasis and visual acuity with less number of absolute patients developing metastasis in endoresection group [6]. This report suggests that endovitreous resection may indeed have a useful role in the management of patients with choroidal melanoma. Various advantages of the surgery include complete removal of the entire tumor mass and photocoagulation of microscopic elements under direct observation, preservation of globe in its entirety and retention of visual

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Table 1 Clinical characteristics of patients

Patient	Age/Sex	Baseline Visual acuity	Size of tumor (Height*base, in mm)	Extent of exudative Retinal Detachment	Post operative visual acuity	Complications	Follow up	Globe Integrity
Case 1	40/M	Finger counting at one meter	12*10	Total	No Light Perception	Hyphema	3 Years	Maintained
Case 2	46/M	Hand motions close to face	13*11	Total	6/36	Partial optic atrophy	2 years	Maintained
Case 3	42/M	6/9	9.67*8.6	Inferior	6/24	Partial optic atrophy	2 years	Maintained

Fig. 1 Demonstrate surgical steps of 25 gauge endoresection of choroidal melanoma, **a** Complete vitrectomy is performed, **b** Surface and margins of the tumor mass are photocoagulated, **c** Endoresection is performed using 25 gauge vitrectomy cutter at high suction (600 mm of Hg) and high infusion pressure (80 mm of Hg), **d** Laser of tumor margins is done after complete resection of mass

acuity in some cases. Also, abundant tissue is available for histopathological and genetic analysis. Intraoperatively, we found these tumors to be surprisingly ‘soft’ in consistency making cutting and aspiration easier. The attachment of the

Fig. 2 **a, b** show preoperative clinical photographs of Case 3, **c** Ultrasound demonstrating classical mushroom shaped mass with overlying exudative detachment, **d** Axial section of CT scan show nasal mass with contrast enhancement, **e, f**: post operative clinical photographs at two months of follow up

tumor to the lamina fusca, however, was very tight along its entire base; but, along the margins wherein no gross tumor mass was evident, the lamina fusca could easily be elevated from the sclera. This ‘sign’ can be used as an end point for base area resection of melanomas.

With the advent of newer minimal gauge vitrectomy systems, entire surgery was performed in a close environment and at a very high suction and flow rate, thus minimizing spill-over of tumor cells. Moreover, software controlled vented gas forced infusion (VGFI) in Constellation responds to any change in intraocular pressure within a few microseconds and thus, is able to maintain high IOP despite high suction and maintains hemostasis. Hypothetically, the chances of port site seeding are also minimized because of use of trocar cannula system as compared to previous 20 gauge vitrectomy systems, although comparable studies will be required for the same. Suesskind et al. in their pilot study have shown that endoresection does not appear to produce an increase in circulating melanoma cells when compared to other modalities of treatment including brachytherapy and enucleation further strengthening the procedure as an option for these cases [7]. We achieved satisfactory results in all our cases of medium to large melanomas using 25 gauge endoresection. Contrary to the theoretical possibility of clogging, we did not encounter this situation during any component of the surgery. Low cut rate, high suction and high flow rate contribute to effective resection of large tumour masses even with 25 G cutter.

To the best of our knowledge, this is the first case series of choroidal melanoma operated using transconjunctival micro incisional 25G vitreous surgery. We conclude that the

approach is useful in retaining the anatomical integrity of the globe. However, the short follow up duration prevents derivation of long term prognosis for eyes treated with endoresection in the manner described herein.

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