Vitreoretinal Surgical Management of Small Choroidal Melanoma: 5-year outcomes in patients avoiding radiotherapy

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Study Purpose

- To report the 5-year outcomes for MIVS management of posterior uveal melanoma targeted to surgical endolaser tumor ablation coupled with FNAB analysis as an alternative to radiotherapy in small choroidal melanoma

Study Methods

- Consecutive case series of 100 eyes of 100 patients with small/medium posterior uveal melanoma
- All eyes with increasing tumor size and/or increasing focal exudative retinal detachment
- All eyes managed with vitrectomy, endolaser tumor ablation, FNAB, IVTA

Gene Expression Profiling DecisionDx-UM

- Castle Biosciences – Validated, CLIA approved
- RT-PCR 15 Genes (3 control genes)
  - CDH1,ECM1, EIF1B,FXR1,HTR2B,ID2,LMCD1,LTA4H MTUS1,RAB31,ROBO1, and SATB1
- Learning algorithm (SVM)
- Predicted classification AND discriminant value

Molecular Signature Class

Metastasis Free

Class	3 year	5 year
Class 1A	98%	98%
Class 1B	93%	79%
Class 2	50%	28%

Censored data 6/9/2011 514 patients p<.0001

Patient Data

- 100 patients
- Age (mean): 68 years
- Exudative focal retinal detachment: 92/100 (92%)
- Increasing tumor size: 64/100 (64%)
- Pre-treatment baseline
  - Visual acuity (mean): 20/80
  - Apical tumor height (mean): 1.9 mm (1.2 – 2.9 mm)

- Mean follow-up: 79 months (72 to 96 months)

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MIVS Biopsy Technique

- 23/25+ gauge pars plana vitrectomy
- Remove hyaloid/ILM
- Remove vitreo-retinal traction overlying tumor
- Direct endo-laser confluent tumor treatment
- 25 gauge needle with multiple needle passes within the tumor
- Inspect for bleeding
- Intravitreal triamcinolone acetonide

MIVS Biopsy/Treatment

Procedure: PPV, MP, EL, PHACO WITH IOL, IVTA, FNBX - OS

MURRAY
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Intraoperative Surgical Findings

- Vitreo-tumoral traction in all eyes (100%)
  - Taut posterior hyaloid to tumor
  - Epiretinal membrane
- Focal exudative retinal detachment in virtually all eyes (92%)
  - Often subtle
  - Located at tumor margin
  - Tractional component
- No retinal tears/rhegmatogenous retinal detachments

Study Results

- Post-treatment: (Mean follow-up: 79 months (72 to 96 months)
  - Tumor apical height (mean): 1.4 mm
  - Progressive retinal detachment: 2/100 (2%, $p < .01$)
  - Visual acuity (6 months): 20/40
  - Visual Acuity (18 months): 20/30 ($p < .02$)
  - Final VA > 20/50: 92% (92/100, $p < .01$)

Study Results

- 100/100 patients alive and well
- 1/100 metastatic disease
- 98/100 local tumor control
- 0/100 infectious events
- 4/100 inflammatory events

Conclusions

- Uveal melanoma treatment is undergoing significant enhancements enabling improved survival, globe retention AND functional visual acuity preservation
- Vitreo-retinal surgical targeting with endolaser tumor ablation, suppression of post-surgical inflammation and molecular genomics may avoid radiotherapy in the majority of small uveal melanomas
- Genomic profiling both feasible and informative allowing tumor risk assessment, targeted patient follow-up and consideration of adjunctive therapy

Genomics Case Series
Molecular Classification

- Class 1 47/50 patients (94%)
  - Class 1a 42/50 (84%)
  - Class 1b 5/50 (10%)
- Class 2 2/50 patients (4%)

- Only one patient with non-diagnostic test (1/50, 2%)

Controversies Remain

- No consensus on primary treatment approach
- No consensus on institution and ongoing timing for intravitreal pharmacotherapy
- No consensus on molecular tumor typing

Take Home Points

- Small tumor management has the single greatest potential impact in patient survival
- Diagnostic accuracy is critical/controversial
- If electing to treat small choroidal melanoma – Local tumor control must be excellent with FIRST treatment
- Small tumor studies demand long-term followup (5-year minimum for this series)

Limitations

- Single institutional study
- Advanced, but variable disease

Strengths

- Single Surgeon
- Defined treatment approaches
- Excellent comprehensive follow-up
- Regional treatment center

Thank you to our patients, families, and colleagues!

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