Secondary Paracentral Macular Hole Following Pars Plana Vitrectomy and Internal Limiting Membrane Peel

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Abstract: A 62 year-old Caucasian male presents with a secondary paracentral macular hole following a pars plana vitrectomy with internal limiting membrane peel in the left eye.

Case Report
I. Case History
   A. 62 year-old Caucasian male presented for comprehensive eye exam without ocular or visual complaints.
   B. Ocular History
      1. History of proliferative diabetic retinopathy with clinically significant macular edema OU
      2. History of intravitreal Kenalog x 2 OD and Avastin x 2 OU for clinically significant macular edema OU
      3. History of pan-retinal photocoagulation OU and focal laser treatment OD
      4. History of pars plana vitrectomy OU
      5. History of membrane stripping with internal limiting membrane peel OU for epiretinal membrane
      6. Pseudophakia OU
   C. Medical History
      1. Coronary heart disease
      2. Diabetes Mellitus
      3. Hypertension
      4. End stage renal disease
      5. Hyperlipidemia
   D. Medications:
      1. Artificial tears
      2. Aspirin
      3. Calcium acetate
      4. Darbepoetin alfa
      5. Furosemide
      6. Hydralazine
      7. Insulin
      8. Lisinopril
      9. Metoprolol tartrate
      10. Niacin
      11. Simvastatin
      12. Sodium bicarbonate

II. Pertinent Findings
   A. Clinical/Physical Findings
      1. Fundus evaluation revealed a round red area approximately 1/3 disc diameter in size surrounded by a cuff of subretinal fluid in the temporal perifoveal region OS
      2. Amsler grid testing revealed general distortion OU with a scotoma nasal to fixation OS
      3. Optical coherence topography confirmed a temporal perifoveal full-thickness hole OS
      4. Fundus photos were taken to document the perifoveal hole OS

III. Differential diagnosis
   A. Primary/leading
      1. Secondary paracentral macular hole following internal limiting membrane removal
   B. Others
1. Macular hole secondary to vitreous traction
2. Macular pseudohole from idiopathic epiretinal membrane
3. Solar retinopathy

IV. Diagnosis and discussion
   A. Secondary paracentral macular holes following internal limiting membrane removal is a rarely reported condition
   B. Pathogenesis of foveal macular holes
      1. Oblique traction via a persistent vitreofoveal attachment following perifoveal vitreous separation
      2. Tangential vitreoretinal traction
      3. Predisposing involutional change of the inner retinal layers at the fovea
   C. Theoretical causes of secondary paracentral macular holes
      1. Use of dye-assisted membrane stripping
      2. Mechanical damage of the retina during internal limiting membrane peel

V. Management
   A. The patient was educated about his condition and referred to a retinal specialist for evaluation. The retina specialist recommended monitoring of the condition every 6 months.
   B. Reported treatments in the literature
      1. Observation
      2. Endophotocoagulation
      3. Argon laser coagulation
   C. Research/Bibliography
   D. References

VI. Conclusion: Secondary paracentral macular holes following internal limiting membrane removal is a rarely reported condition. There are few reported cases and published literature on the subject is scant. A commonality among documented cases involves the delamination of the internal limiting membrane. There is controversy about the iatrogenic retinal damage that occurs from internal limiting membrane peeling, specifically, the use of different dyes and the removal of the membrane itself. It remains unclear as to the direct cause of damage and why the secondary holes all develop temporal to the fovea as opposed to nasally. Cases in which there is no evident traction are generally observed and followed for stability. In cases requiring treatment, current management options include endophotocoagulation and argon laser coagulation. Considering the widespread use of internal limiting membrane peeling in the treatment of macular pathologies, clinicians should be cognizant of this potential post-operative finding.