11:00 AM

Incidence of and Risk Factors For Developing Idiopathic Macular Hole Among a Diverse Group of Patients Throughout the United States

- Jay M. Stewart, MD
- Ferhina S. Ali, MD, MPH
- Joshua D. Stein, MD, MS

OBJECTIVE Identify variables associated with macular hole formation using an epidemiologic study on a large, nationwide database.

PURPOSE To determine the incidence of and risk factors for macular hole in a large group of managed care beneficiaries throughout the United States.

METHODS A retrospective, longitudinal cohort study was conducted of all beneficiaries 40 years or older who were continuously enrolled for 3 or more years in a nationwide US managed care network between January 1, 2001 and December 31, 2012, who had two or more visits to an eye care professional. The managed care network was queried starting in 2009, and data analysis was conducted from December 1, 2014 to August 15, 2016.

RESULTS The study identified 659,357 eligible enrollees (including 391,674 women and 267,683 men; mean age 56 years). Of these, 144 (0.02%) developed MH requiring

vitrectomy. After adjusting for confounding factors, women had a 64% increased risk of MH compared with males (adjusted hazard ratio 1.64; 95% CI 1.11-2.43; P<0.01), with the effect of sex varying across ages. Compared with Caucasian participants, Asian-American enrollees had a 177% increased risk of developing MH (adjusted hazard ratio 2.77; 95% CI 1.27-6.02); P=0.01).

CONCLUSION In this large cohort, sex was confirmed to be associated with the development of MH requiring vitrectomy; the effect varies across ages differently for women and men. These differences may be the basis for underlying pathophysiologic factors contributing to MH formation.

TAKE HOME MESSAGE Female sex is associated with a 64% increased risk of macular hole formation.

HUMAN RESEARCH No, the study does not involve human

11:03 AM

Comparative Study of Inverted ILM Flap Versus Conventional Technique in Idiopathic Large Macular Holes-Anatomical and Visual Outcomes

- Naresh Babu Kannan, MS, FNB, MBA
- Kim Ramasamy, MBBS,DO,DNB

OBJECTIVE To compare the anatomical and visual outcome of conventional internal limiting membrane (ILM) peeling and inverted ILM flap in idiopathic large macular holes.

PURPOSE Immense technological refinements have ameliorated the anatomical success rates of macular hole surgery to as high as 93-98%. But poor prognosis for large macular holes i.e. anatomical success rate of mere 40 to 80%, has demoralized most surgeons from operating upon these patients. Inverted flap technique appears to be safe and effective.

METHODS Study design: Prospective, randomized trial Inclusion criterion: 56 Patients undergoing 25G pars plana vitrectomy (PPV) for idiopathic full thickness macular hole (FTMH) with hole diameter range of 600-1500µm Exclusion criterion: Myopic and traumatic holes, co-existing ocular pathologies affecting vision Procedure: Group A-

Conventional ILM peeling, Group B-Inverted ILM flap. Adjuncts used were Heavy Brilliant blue G dye (HBBG; 10% dextrose) and 100% SF6. Measurements: FTMH evaluated with Optical Coherence Tomography. Snellen visual acuity converted to logMAR used for statistical analysis Outcome measures: Postoperative anatomical and visual outcome.

RESULTS Results: There were 28 patients in each group. Mean MD in Group A and B were 757.46±87.54 and 809.93±122.27μm (p value, 0.070). Median best corrected visual acuity (BCVA) were logMAR 0.78 and 0.69 respectively (p value, 0.266). In Group A, 75.0% patients achieved Type1 Closure, 7.1% Type2 closure and 17.9% remained open. In Group B, 89.3% patients attained Type1 Closure while 10.7% (n=3/28) remained open (p value, 0.353). Median BCVA after 6 months were logMAR 0.60 and 0.48 (p value, 0.027). BCVA improved by 1.8 and 2.1 ETDRS lines in Group A and B respectively. Final BCVA≥20/60 was achieved in 25% patients in Group A and 50% patients in Group B. One patient in each group had a rise of IOP, which was controlled on topical drops. None of the holes re-opened at 6months. Final visual acuity did not correlate with MD, base diameter, macular hole index, tractional hole index or hole forming factor.

CONCLUSION Inverted ILM flap is better technique for idiopathic large FTMH. Adjuncts like HBBG, 2 cc of 100% SF6 is safe and efficacious. 10% dextrose increases density of dye. This allowing selective staining as the dye settles on macula instead of scattering, easy removal and decreased surgery time. Smaller volume of gas used is cost effective and saves time lost achieving isoexpansile concentration.

TAKE HOME MESSAGE Inverted ILM flap technique is effective in large macular holes. Use of 100% SF6 is safe and cost effective alternate to isoexpansile concentration. Heavy BBG allows selective staining of macula.

HUMAN RESEARCH This study involves human research.
IRB Approval Status: Approved by institutional review board

11:06 AM

Macular Holes in Diabetic Patients Treated With Inverted ILM Flap

- Jerzy Nawrocki, MD, PhD
- Zofia Michalewska, MD, PhD

OBJECTIVE Results of vitrectomy with inverted ILM flap technique for both diabetics without retinopathy with coexisting macular hole and patients with proliferative diabetic retinopathy and macular hole.

PURPOSE To present different characteristics of macular holes in diabetic patients with and without retinopathy. Additionally, to examine the results of vitrectomy with the inverted ILM flap technique.

METHODS Retrospective, observational study. We reviewed our database in order to select patients with diabetes and macular holes treated with the inverted ILM flap technique. Patients had a complete ophthalmic examination and spectral domain or swept source OCT before surgery and then at one week, one, three, six and twelve months after surgery. In cases without retinopathy and with nonproliferative retinopathy core vitrectomy and the inverted ILM flap technique was performed. In proliferative diabetic retinopathy, complex vitrectomy was performed, completed with the inverted ILM flap.

RESULTS 20 eyes of 18 patients with diabetes and full-thickness macular holes were included in the study. 15 eyes had no signs of diabetic retinopathy, one eye had

nonproliferative diabetic retinopathy and four eyes had proliferative retinopathy. All macular holes were closed after first surgery. Mean visual acuity in eyes without retinopathy was 0.41 logMAR and in proliferative retinopathy was 1.22 logMAR. Final visual acuity was significantly higher in eyes without visible retinopathy (p=0.0004). In OCT, in eyes with proliferative diabetic retinopathy even if the macular hole was closed with the inverted ILM flap, we observed persistent presence of fluid under the fovea, which required several months to reabsorb. In one case despite closure of macular hole the fluid did not reabsorb in more than twelve months' follow-up. The prolonged absorption of fluid was associated with multiple photoreceptor, external limiting membrane and retinal pigment epithelium defects shown in OCT.

CONCLUSION The inverted ILM flap technique allows closure of all macular holes, including in severe proliferative retinopathy. In proliferative diabetic retinopathy, we might distinguish another type of macular hole formation, which is caused not only by traction but also insufficiency of retinal pigment epithelium and its poor ability to absorb subretinal fluid in the long term.

TAKE HOME MESSAGE The inverted ILM flap technique results in satisfactory results in macular holes in proliferative and nonproliferative diabetic retinopathy.