11:06 AM

A Small-Gauge Fragmatome and Method for Removal of Retained Lens Fragments

- William J. Foster, MD, PhD, FRCSC

OBJECTIVE To describe a device and method to remove retained lens fragments from the posterior segment of the eye that is compatible with current small-gauge vitrectomy instrumentation.

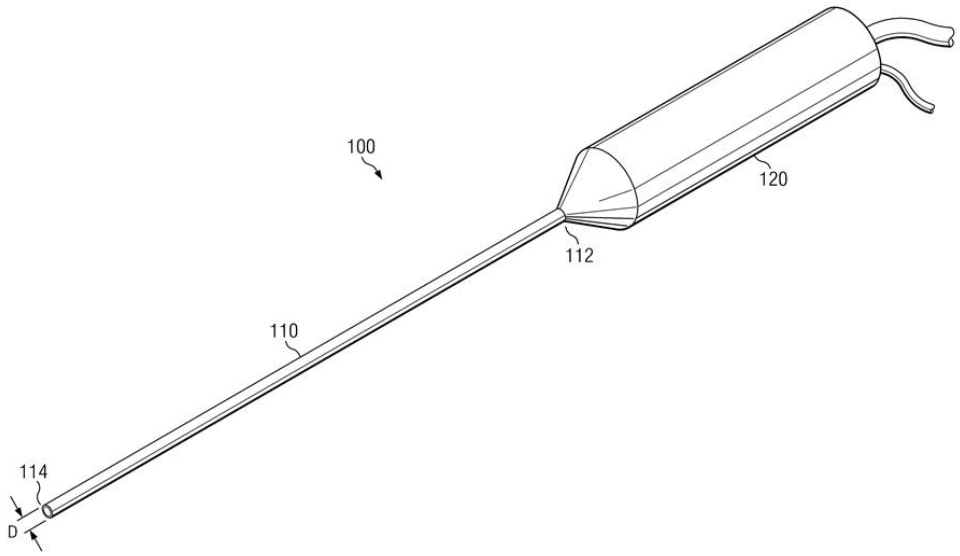
PURPOSE We sought to develop a device and technique that allows for the removal of retained lens fragments through small gauge (27-, 25- or 23-gauge) trocars.

METHODS Description of the device and method, with *in vitro* demonstration of the device and method.

RESULTS By separating the two roles of a conventional fragmatome: (1) fragmentation of retained lens material and (2) evacuation of the residual lens particles from the eye, it is possible to remove retained lens material from the posterior segment of the eye utilizing a small-gauge vitrectomy system. A device to implement this technique is described.

CONCLUSION Small-gauge management of retained lens fragments is feasible and may be available in the near future.

TAKE HOME MESSAGE Small-gauge management of retained lens fragments is feasible and may be available in the near future.



11:10 AM

Pilot Evaluation of a New Portable Small-Gauge Vitrectomy Unit

- Thomas M. Aaberg Jr. , MD
- Scott J Westhouse, DO

OBJECTIVE A new portable small gauge vitrectomy unit, was used in 7 eyes of 7 patients, and proved to be safe, efficient, and efficacious.

PURPOSE To assess the safety and efficacy of a new portable small gauge vitrectomy unit.

METHODS This is a retrospective case series of 3-port PPV performed on 7 patients using a prototype vitrectomy unit (Synergetics, Inc). This unit is portable, can perform 25- and 23-gauge PPV, is equipped with a built in LED light source, has an air-pump, and is powered by either a 120V alternating-current, or built-in rechargeable battery. The pneumatic drive is powered by compressed nitrogen or air, or CO2 cartridges. The cutter has variable speed control (0-2500 cpm). Six cases were performed in an ASC, and one in the office. Data collected included pre/post-op acuity, diagnosis, surgery type, anesthesia type, surgical time, complications, follow-up period, and surgical impressions.

RESULTS Three men and 4 women with a mean age of 70 yrs (40-86 yrs) had the following diagnoses: macular pucker (4), macular hole (1), VMT (1), and vitreous hemorrhage with a retinal tear (1). The mean preop acuity was 20/100 (20/40-20/800).The mean last postop acuity was 20/48 (20/20-20/400).Acuity improved in 6 of 7 patients. Average surgical time was 38 minutes (24-56 min). No surgical complications occurred. Cases performed in the ASC had monitored anesthesia care, a retrobulbar block, and a full surgical staff.The case performed in the office had 10 mg of valium, a retrobulbar block, and an ophthalmic technician. Procedures performed included PPV, membrane peel, FAX, gas injection, and indirect laser. As compared to current vitrectomy units, our impressions were that the prototype had a comparable cutter and illumination.The foot peddle had limited function. The infusion pressure was controlled by infusion fluid bag height, consequently requiring an assistant to manually adjust.

CONCLUSION The prototype performed well with no machine related complications. Patients had uneventful surgeries with good visual and anatomic outcomes.The unit proved useful with respect to its portability and capabilities. Unit refinements are on-going. Further study of utilization costs, efficacy and an expanded use in non-traditional surgical settings (such as the office or remote areas) is warranted.

TAKE HOME MESSAGE The prototype is a new portable small gauge vitrectomy unit that offers quality performance at reduced cost, and potentially greater patient access.

11:14 AM

Benefit of Direct-View for Submacular Surgery

- Zhizhong Ma, MD
- Hongliang Dou, MD
- Xuefeng Feng, MD, PhD
- Yuntao Hu, MD
- Yimin Xu, MD
- Changguan Wang, MD, PhD

OBJECTIVE At direct-view submacular surgical procedure benefited submacular precise manipulations with potentiality of multi-utilities.

PURPOSE To introduce a newly developed submacular surgery which enables to manage lesions precise, expand indications and decrease surgical complications.

METHODS Temporal semi-circle peripheral retinotomy is performed and retinal flap was flipped toward the nasal side fixed by self-designed gold bar to create direct-view surgical field for submacular manipulations.

RESULTS With this technique, satisfactory visualization can be achieved not only for sufficient debridement and facilitative retinal pigment epithelium (RPE) transplantation but also for precise removal of choroidal neo-vessels with maximal preservation of RPE, differentiation of age-relative macular degeneration (ARMD) diagnosis from polypoidal choroidal vasculopathy and design of surgical procedures depending on individual feature accordingly.

CONCLUSION With avoiding injury of Bruch's membrane and macular, surgical complications can be decreased. Better specimen could be obtained for histopathological analysis. Other utilities such as delivery of pharmaceutical agents, transplantation of cultured tissues, mounting of visual prosthesis are perspective.

TAKE HOME MESSAGE At direct-view submacular surgical procedure benefited submacular precise manipulations with potentiality of multi-utilities.

11:18 AM

Electronic Reading Devices Increase Reading Speed and Comfort in Patients with Moderate Vision Loss

- Daniel B. Roth, MD
- Jonathan L. Prenner, MD
- Howard F. Fine, MD, MHSc
- William J Feuer, MS
- Anthony Fernandes, BA
- Henry L Feng, BS

OBJECTIVE To assess reading speed and comfort in patients with moderate visual loss while reading newspaper, books, printed material, iPad® and Kindle® and determine the ideal reading medium.

PURPOSE New electronic reading devices especially those with back illumination, may enhance the ability to read and perform visual tasks in patients with macular disease. We sought to evaluate the ability of electronic reading devices to enhance reading speed and comfort in patients with compromised visual acuity and/ or complaints of difficulty with reading tasks.

METHODS New electronic reading devices especially those with back illumination, may enhance the ability to read and perform visual tasks in patients with macular disease. We sought to evaluate the ability of electronic reading devices to enhance reading speed and comfort in patients with compromised visual acuity and/ or complaints of difficulty with reading tasks.

RESULTS Reading speed was 114 WPM for newspaper, 118 WPM for print, and 128 WPM for iPad® ($p<0.001$). Printed material was read more quickly than newspaper ($p=0.02$) but iPad® was read more quickly than either newspaper or print ($p<0.001$). Poor visual acuity was correlated with a slower reading speed, but improvement in reading speed on the iPad® was found at all levels of visual acuity. Patients' reading speed increased on the iPad® when the font was magnified to 18 point (121 to 137 WPM, $p<0.001$). The iPad® 12 point resulted in improved reading speed when compared to the Kindle® at 12 point (127 vs 94 WPM, $p<0.001$) and at 18 point (97 vs 72 WPM, $p<0.001$). This difference was most pronounced in patients with visual acuity of ≤20/40. The Kindle® was not significantly different than the paper version of the book. 68% of patients preferred reading on the iPad® and 70% of patients preferred viewing the material with a magnified font.

CONCLUSION Back illuminated devices, especially ones with an easy method to increase font size, may offer a significant advantage to aid patients with reduced visual acuity to function better, reading more quickly and with less difficulty.

TAKE HOME MESSAGE The reading of patients with moderate vision loss may be significantly enhanced by the use of back-illuminated electronic reading devices, such as the iPad®, improving their reading speed and comfort.

11:30 AM

Initial Experience with Oral Rifampin for Treatment of Central Serous Chorioretinopathy

- Zac B. Ravage, MD
- Kirk H. Packo, MD, FACS
- Pauline T. Merrill, MD

OBJECTIVE To describe the clinical outcomes of patients treated with oral rifampin for central serous chorioretinopathy (CSC).

PURPOSE We previously described a case of chronic CSC responsive to rifampin and surmised that it might benefit other patients, as well. We therefore offered rifampin as off-label treatment to select patients with CSC. The hypothesized mechanism of action is rifampin-mediated induction of cytochrome P-450 and accelerated hepatic metabolism of corticosteroids.

METHODS We conducted a retrospective, non-comparative, interventional case series of patients treated with off-label rifampin (600 mg/day) for CSC. Patients with abnormal liver function or potential drug interactions were excluded. A total of 10 patients with acute or chronic CSC were included. Follow-up visits were typically performed at 1 week then monthly. Fluorescein angiography and optical coherence tomography (OCT) were performed on presentation and repeated at the discretion of the physician. Treatment

with rifampin was continued until resolution of retinal edema and sub-retinal fluid (SRF) was observed. Patients were then followed routinely for recurrent activity.

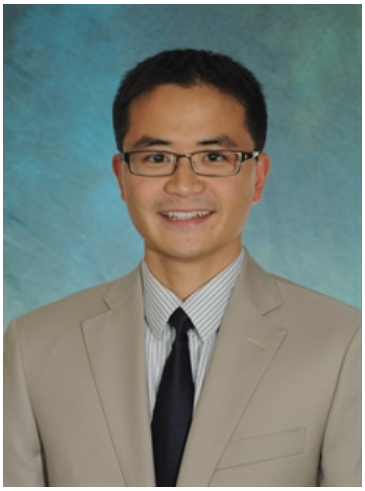
RESULTS 8 patients had chronic CSC and 2 had acute CSC. 4 patients had a history of steroid use. Prior treatment included bevacizumab (1) and thermal laser (1). Outcomes of 11 eyes of 9 patients were reviewed. 1 patient did not have follow-up after the initial visit and was excluded from further analysis. Snellen visual acuity ranged from 20/40 to 20/150 on presentation. Vision improved 1-4 lines in 5 eyes and was unchanged in 6. OCT showed a reduction in SRF in 6 eyes, with complete resolution in 4. In 3 eyes the effect was equivocal and 2 showed no response. A decrease in SRF or edema was observed as early as 1 month after starting rifampin in cases of chronic CSC and by 1 week in acute CSC. Chronic fluid typically required 3-4 months of therapy for complete resolution. After drug cessation, recurrence was not observed during follow-up of up to 6 months. Observed side effects included nausea & headache (1), rash (1) and hepatitis (1).

CONCLUSION The results of this small case series suggest that rifampin may potentially benefit some patients with CSC. Acute episodes appear to respond favorably, as do longstanding cases with diffuse RPE loss. Chronic SRF may decrease gradually during treatment, while sub-RPE fluid often persists. Vision remains stable or improves over the course of therapy.

TAKE HOME MESSAGE Rifampin may potentially benefit some patients with CSC. Acute episodes appear to respond favorably, as do longstanding cases with diffuse RPE loss.

11:34 AM

Early Detection of Functional Changes Using Microperimetry on Patients with Subclinical Hydroxychloroquine Toxicity



- Clement C. Chow, MD
- Renu Jivrajka, MD
- Mohamed A. Genead, MD
- J. Jason McAnany, PhD
- Gerald Fishman, MD
- William F. Mieler, MD

OBJECTIVE To determine if microperimetry could detect early functional loss in patients on hydroxychloroquine who do not have evidence of retinopathy as assessed by current recommended screening standards.

PURPOSE To report microperimetry findings in patients who are on hydroxychloroquine (Plaquenil) for more than 5 years with normal visual acuity, 10-2 Humphrey visual field (HVF), spectral-domain optical coherence tomography (SD-OCT), fundus autofluorescence (FAF), and multifocal electroretinogram (mfERG).

METHODS Patients who had been treated with 200 or 400 mg/day of Plaquenil for more than 5 years, without visual complaints (visual acuity 20/25 or better), and without a history of diabetes or macular disease were included. These patients underwent a

complete ophthalmic examination that included medical history, best-corrected visual acuity, slit lamp biomicroscopy, funduscopic exam, color vision, SD-OCT, 10-2 HVF, FAF, mfERG, and microperimetry (OPKO instrumentations, Miami, FL) that covered the central 12^{o} centered on the fovea. Age-similar, visually normal subjects served as controls.

RESULTS Sixteen patients were included. On average, our study cohort was 54.5 years of age (range 37-76 years) with a daily Plaquenil dose of 4.00 mg/kg/day (range 1.77-6.67 mg/kg/day) and a cumulative dose of 1485 grams (range 255.5 to 3650 grams). All patients had normal anterior segment and funduscopic exams, full 10-2 HVFs, normal SD-OCT, FAF and mfERG. The median retinal sensitivity, as assessed by microperimetry, was 15.3 dB OD and 14.4 dB OS. Given the median sensitivity of the two eyes did not differ significantly (Mann-Whitney Rank Sum Test, $p = 0.22$), the sensitivity data from the left and right eyes were averaged and compared to the sensitivity values of 10 age similar, visually normal subjects. The median sensitivity of the study patients (15.5 dB) was significantly lower than that of the visually normal subjects (17.0 dB) (Mann-Whitney Rank Sum Test, $p < 0.001$).

CONCLUSION Patients on Plaquenil without clinical evidence of retinal toxicity showed reduced retinal sensitivity within the central 12^{o} of the macula, as assessed by microperimetry, suggestive of early functional loss. The sensitivity differences between the patients and controls, while small, suggest that microperimetry may be an additional useful technique for identifying Plaquenil toxicity.

TAKE HOME MESSAGE In addition to 10-2 HVF, SD-OCT, fundus autofluorescence and multifocal ERG, microperimetry may be an additional useful technique for identifying early Plaquenil toxicity in patients.