Surgical Technique

Ex-PRESS Shunt for Choroidal Fluid Drainage in Uveal Effusion Syndrome Type 2
A Potentially Novel Technique

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Uveal effusion syndrome (UES) was reported by Schepens and Brockhurst in 1963, and later described as a nanophthalmic disorder with a scleral abnormality. Gass described idiopathic UES and hypothesized that the cause was a congenital anomaly of the sclera and vortex veins that was related to aging, hormonal changes, or impairment of the permeability of the sclera. Using histological methods, Trelstad et al reported the scleral abnormalities in UES. In addition, Forrester et al observed migration of retinal pigment epithelial cells into the subretinal space.

For the treatment of UES, Brockhurst described good surgical results with decompression of the vortex veins by scleral resection with a sclerotomy. Gass reported an effective surgical procedure with a sclerectomy and sclerostomy without decompression of the vortex veins owing to the difficulty of isolating the vortex veins. Uyama et al treated 19 eyes of 16 patients with UES by making a two-third–thickness scleral flap and performing a scleral excision to expose the underlying choroid.

The Ex-PRESS shunt (Alcon Laboratories) glaucoma implant is a small (2- to 3-mm–long and 0.4-mm–diameter tube) stainless steel nonvalved device that was designed to lower intraocular pressure by shunting aqueous humor from the anterior chamber into the subconjuntival space. In the current study, we report the surgical outcomes of the use of an Ex-PRESS shunt device for choroidal drainage without vortex vein decompression for the management of 3 eyes with UES.

Procedures

A retrospective medical record review was performed of 2 consecutive patients (eyes) with UES without nanophthalmos who underwent Ex-PRESS shunt implantation at the Clínica de Ojos de Maracaibo, Maracaibo, Venezuela, from March 2012 through March 2014 (Table). Institutional review board/ethics committee approval was obtained from Clínica de Ojos de Maracaibo and the patients signed a standard informed consent. This study adhered to the tenets of the Declaration of Helsinki for research involving human participants.

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After peribulbar anesthesia and standard asepsis and antisepsis in the operating room, a conjunctival incision was performed, bare sclera was exposed in the quadrant with more accumulation of fluid according to ultrasonography, and an oblique sclerotomy was performed with a 25-gauge needle 13 mm posterior to the limbus (to decrease the risk for infection), at which time, a small amount of suprachoroidal fluid was spontaneously drained. The Ex-PRESS shunt (model P-50) was then inserted obliquely in the sclerotomy to facilitate the continuous drainage of the suprachoroidal fluid (eFigure 1 in the Supplement). Balanced salt solution was injected into the anterior chamber with a 30-gauge needle to reconstitute intraocular pressure. The conjunctiva was closed with 7-0 polyglactin 910 suture and subconjunctival antibiotics were injected.

Report of Patients

Patient 1
A woman in her 60s presented to the emergency department with a 15-day history of a “shadow” that affected the upper part of the visual field in her left eye. She had undergone cataract surgery in both eyes 3 years prior to presentation. Her best-corrected visual acuity (BCVA) without any refractive error was 20/20 OD and 20/200 OS. Fundus examination revealed choroidal detachment and shifting subretinal fluid underneath the exudative retinal detachment of the left eye. Ultrasonography was performed demonstrating thick sclera (1.5 mm), choroidal detachment, and exudative retinal detachment (eFigure 2 in the Supplement). The axial length was 22 mm in the right eye.

Table. Demographic and Baseline Characteristics, Functional and Anatomic Results, and Complications in Eyes With Ex-PRESS Shunt for Choroidal Drainage in UES

<table>
<thead>
<tr>
<th>Eye No./Sex/Age, y</th>
<th>Diagnosis</th>
<th>UES Duration, d</th>
<th>Previous Surgery</th>
<th>BCVA Baseline</th>
<th>Last FU</th>
<th>CD and SRF Baseline</th>
<th>Last FU</th>
<th>Total FU, mo</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/F/65</td>
<td>UES</td>
<td>14</td>
<td>Cataract surgery</td>
<td>20/200</td>
<td>20/30</td>
<td>Yes</td>
<td>None</td>
<td>24</td>
<td>None</td>
</tr>
<tr>
<td>2/F/55</td>
<td>UES</td>
<td>21</td>
<td>None</td>
<td>20/400</td>
<td>20/40</td>
<td>Yes</td>
<td>None</td>
<td>24</td>
<td>None</td>
</tr>
<tr>
<td>3/F/55</td>
<td>UES</td>
<td>14</td>
<td>None</td>
<td>20/200</td>
<td>20/40</td>
<td>Yes</td>
<td>None</td>
<td>12</td>
<td>None</td>
</tr>
</tbody>
</table>

Abbreviations: BCVA, best-corrected visual acuity; CD, choroidal detachment; F, female; FU, follow-up; SRF, subretinal fluid; UES, uveal effusion syndrome.
Ex-PRESS Shunt for Choroidal Fluid Drainage

Surgical Technique  Clinical Review & Education

Ex-PRESS Shunt for UES
Uveal effusion syndrome is difficult to manage and often follows a relapsing course. Our 3 cases (eyes) can be classified as type 2 according to the classification by Uyama and colleagues5 because they were not associated with nanophthalmos or hyperopia but had a thick sclera. Although Brockhurst6 described good surgical results with decompression of vortex veins, other investigators7 have questioned the usefulness of this technique because vortex veins are difficult to isolate. Uyama et al7 reported that sclerectomy with a small sclerostomy under the scleral flap could be effective in both type 1 and type 2 UES because the abnormal sclera and increased transl scleral outflow of intraocular fluid are thought to be the main causes of these disorders. However, this technique was not effective in type 3 UES, which develops in non-nanophthalmic eyes with normal eyeball size and normal scleral thickness.

We believe that isolation of the vortex veins is complicated and that vortex vein decompression is technically difficult to perform without complications such as vein rupture. Therefore, we elected to perform the Ex-PRESS shunt technique instead of full-thickness sclerectomy or scleral windows because it seemed likely to have a sufficient effect for resolving UES. We suspect that our technique may work by facilitating a constant drainage of uveal exudation from the suprachoroidal space to the subconjunctival space.

The actual surgical technique and implantation of the device are very simple. The tip of the Ex-PRESS shunt is not sharp and it is inserted obliquely so the chance to cause retinal damage is unlikely. In addition, considering the reported persistent and recurrence rates (23%-50%) for type 2 UES,7,8,9,10 it seems that the cost may be worthwhile. Compared with other surgical procedures, our Ex-PRESS shunt technique could simplify the operative procedure, is less invasive, and reduces surgical time.

Limitations of our report include that we cannot know the long-term benefits and risks from 3 eyes and limited follow-up. At this point, we know that the procedure is feasible and safe for a limited time.

ARTICLE INFORMATION
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Submitted for Publication: August 17, 2014; final revision received November 2, 2014; accepted November 12, 2014.
Conflict of Interest Disclosures: All authors have completed and submitted the ICJJE Form for Disclosure of Potential Conflicts of Interest. Dr Arevalo has received personal fees from Iridex, Optos Inc, Novartis Pharmaceuticals Corp, and Allmera Sciences Inc for lectures; from Second Sight LLC and Alcon Laboratories for serving as a consultant and lecturer; and from Springer SBM LLC related to a patent. No other disclosures were reported.

REFERENCES

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