<table>
<thead>
<tr>
<th>Title</th>
<th>Changes in the retinal inner limiting membrane associated with Valsalva retinopathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s)</td>
<td>Gibran, SK; Kenawy, N; Wong, D; Hiscott, P</td>
</tr>
<tr>
<td>Citation</td>
<td>British Journal Of Ophthalmology, 2007, v. 91 n. 5, p. 701-702</td>
</tr>
<tr>
<td>Issued Date</td>
<td>2007</td>
</tr>
<tr>
<td>URL</td>
<td><a href="http://hdl.handle.net/10722/138160">http://hdl.handle.net/10722/138160</a></td>
</tr>
<tr>
<td>Rights</td>
<td>British Journal of Ophthalmology. Copyright © BMJ Publishing Group.; This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.</td>
</tr>
</tbody>
</table>
At 34 years of age, her best-corrected visual acuity remained 20/30, but visual fields had decreased to only a central island. OCT was performed using topographical mapping and longitudinal reflectivity profile (LRP) analyses.5 A 41-year-old Caucasian male was referred to the vitreoretinal services with a spontaneous haemorrhage in the left eye and normal fundus appearance in the right eye. Ultrasound echo-graphy revealed a posterior vitreous detachment, vitreous haemorrhage and a macular elevation in the left eye. Systemic examination was normal. Laboratory investigations showed normal complete blood count, prothrombin time and activated partial thromboplastin time. Blood pressure and urine analysis were normal. After discussions with the patient, a decision was made to perform a 20-gauge three-port pars plana vitrectomy. Intraoperatively, after core vitrectomy and removal of the vitreous haemorrhage, a sub-ILM haemorrhage typical of Valsalva retinopathy was noted. ILM peel was performed without the assistance of dye, and the excised tissue was processed for histopathological assessment. Postoperatively, 3 months the patient had increased SVA, 6/6 unaided, with no secondary complications.

Histological examination of the excised tissue (fig 1A) revealed that it contained convoluted ILM. The vitreous (smooth) surface of the ILM was free of cells except for a cellular component in the specimen, and this component was on the retinal side (undulated surface) of the ILM (fig 1B). The cellular component included a prominent multilayer aggregate of cells that was immunoreactive to cytokertin 7 (fig 1C), which is a marker of transdifferentiated retinal pigmem epithelial (RPE) cells 4. These cells were negative for glial and neural markers. Nevertheless, glial and neural elements were present elsewhere in the specimen, again on the retinal rather than the vitreous surface of the ILM (fig 1D,E). CD68-positive macrophages were scattered through the specimen and there was also scattered pigment that was partly intracellular and partly extracellular. Perls (Prussian blue) staining confirmed that the pigment was a mix of melanin and haemosiderin (fig 1F).

Discussion

The plane of retinal Hg in Valsalva retinopathy is sometimes difficult to determine, especially in the absence of PVD. Ocular coherence tomography (OCT) has been used to determine the exact location when the vitreous medium is clear and it is generally agreed that it is sub-ILM in location. Following core and posterior vitrectomy, we could confirm that a sub-ILM haemorrhage was present. The Hg was possibly a consequence of the patient’s hay fever-related sneezing that is thought to occur from a sudden rise in the intrathoracic pressure caused by a forceful exhalation against a closed glottis.

Therapeutic options in Valsalva retinopathy include conservative management, surgery (vitreotomy) and laser membranotomy. Epiretinal membrane (ERM) formation with ILM wrinkling has been reported 10 months after ND-YAG membranotomy of Valsalva Hg.9 Histological examination of surgically removed ILM revealed the presence of haemosiderin within macrophages on the retinal side of the ILM and a fine glial ERM, resembling possible glial proliferation on the vitreous surface of the ILM 3. Our case also revealed haemosiderin on the retinal surface of the ILM, again confirming the sub-ILM location of the haemorrhage, but

References

Sections through the excised internal limiting membrane (ILM). (A) Staining with periodic acid Schiff reagent and haematoxylin reveals convoluted ILM with adjacent cells. (B) High-power view of section in (A) to show that the cells are on the undulated (retinal) surface of the ILM (arrows) whereas no cells are seen on the smooth (vitreous) surface (arrowheads). (C) Stained with the immunoperoxidase technique for cytokeratin 7 (red-brown chromagen) and counterstained with haematoxylin; layers of transdifferentiated retinal pigment epithelial (RPE) cells are observed (arrows). Inset: higher magnification demonstrates that the RPE cells are adjacent to the undulated (retinal) surface of the ILM (arrow). (D, E) Sections stained with the immunoperoxidase technique (red-brown chromagen) for the glial marker glial fibrillary acidic protein (D) and the macrophage marker CD68 (E), respectively, and counterstained with haematoxylin. (D) Gial cells are abundant in the tissue but have a distribution different from that of RPE cells (compare with C). (E) Macrophages are more scattered throughout the tissue. (F) A section stained with Peroxidase method reveals iron of presumed blood origin (blue deposit; arrow) as well as melanin pigment (arrowhead).

Instead of an ERM there was a mixed-cell-type proliferation on the retinal surface of the ILM. The sub-ILM cells included trans-differentiated RPE cells, and hence the proliferation had the histological appearances of a proliferative vitreoretinopathy (PVR)-type membrane “beneath” the ILM. Presumably, the RPE cells had been attracted to this location by the sub-ILM blood, since it is well established that RPE cells migrate to various blood components and can move through intact retina 5.

Intraretinal pathology in PVR is a well-recognised pathological event, but usually the retinal changes resemble gliosis 6. Our case suggests that focal RPE proliferation, similar to that seen in PVR epiretinal membranes, can occur within the neuroretina, and specifically in a sub-ILM location, by transmigrated RPE cells as a response to intraretinal haemorrhage. Such proliferation might prevent complete visual recovery after reabsorption of the retinal haemorrhage and justify early surgical intervention instead of routine observation or laser membranotomy.

**References**


**Lemon juice and Candida endophthalmitis in crack-cocaine misuse**

The Centers for Disease Control and Prevention recently reported that a substantial number of drug misusers in the US are injecting crack-cocaine instead of smoking it, owing to the decreased availability and increased cost of powdered cocaine. The use of lemon juice to dissolve crack-cocaine has been shown to cause abscesses, permanent vein damage and infections. Furthermore, heroin dissolved in preserved lemon juice was documented to be a source of *Candida albicans* in multiple, small epidemics of fungal endophthalmitis in the 1980s in the UK and Australia. 1, 4 We report here two recent cases of fungal endophthalmitis in crack users who similarly disclose dissolving crack-cocaine in lemon juice injection.

**Case 1**

A 34-year-old male intravenous drug user presented to his primary care physician with high fever and bilateral blurry vision for the past 20 days. Blood cultures and ECG were negative. The patient reported dissolving crack in preserved lemon juice.

His visual acuity was 20/40 OD and 20/70 OS. Dilated fundus examination revealed multiple condensations in the vitreous with choroidal and retinal foci in both eyes. A pars plana vitrectomy was performed OD with intravitreal injections of vancomycin (1 mg/0.1 ml), ceftazidime (2 mg/0.1 ml) and amphotericin B (7.5 μg/0.1 ml). Vitreous cultures grew *C. albicans*, and the patient was treated with oral diflucan (200 mg daily). The patient received five intravitreal injections of amphotericin B (5 μg/0.1 ml) in the vitrectomised right eye and three in the non-vitrectomised left eye over 3 weeks for persistent active lesions. At the most recent examination, 12 weeks after presentation, the patient’s vision was 20/20 OD and 20/50 OS.

**Case 2**

A 37-year-old homeless male intravenous drug user reported a 3-month history of decreased vision, eye pain and floaters in his right eye. He recently reported that a substantial number of drug misusers in the US are injecting crack-cocaine instead of smoking it, owing to the decreased availability and increased cost of powdered cocaine. A vitreous aspiration was performed, with intravitreal injections of ceftazidime (2 mg/0.1 ml) and vancomycin (1 mg/0.1 ml) in the right eye. The vitreous aspirate grew *C. albicans*. New York: Oxford University Press, 1998:478–91.


**Lemon juice and Candida endophthalmitis in crack-cocaine misuse**

The Centers for Disease Control and Prevention recently reported that a substantial number of drug misusers in the US are injecting crack-cocaine instead of smoking it, owing to the decreased availability and increased cost of powdered cocaine. The use of lemon juice to dissolve crack-cocaine has been shown to cause abscesses, permanent vein damage and infections. Furthermore, heroin dissolved in preserved lemon juice was documented to be a source of *Candida albicans* in multiple, small epidemics of fungal endophthalmitis in the 1980s in the UK and Australia. 1, 4 We report here two recent cases of fungal endophthalmitis in crack users who similarly disclose dissolving crack-cocaine in lemon juice injection.

**Case 1**

A 34-year-old male intravenous drug user presented to his primary care physician with high fever and bilateral blurry vision for the past 20 days. Blood cultures and ECG were negative. The patient reported dissolving crack in preserved lemon juice.

His visual acuity was 20/40 OD and 20/70 OS. Dilated fundus examination revealed multiple condensations in the vitreous with choroidal and retinal foci in both eyes. A pars plana vitrectomy was performed OD with intravitreal injections of vancomycin (1 mg/0.1 ml), ceftazidime (2 mg/0.1 ml) and amphotericin B (7.5 μg/0.1 ml). Vitreous cultures grew *C. albicans*, and the patient was treated with oral diflucan (200 mg daily). The patient received five intravitreal injections of amphotericin B (5 μg/0.1 ml) in the vitrectomised right eye and three in the non-vitrectomised left eye over 3 weeks for persistent active lesions. At the most recent examination, 12 weeks after presentation, the patient’s vision was 20/20 OD and 20/50 OS.

**Case 2**

A 37-year-old homeless male intravenous drug user reported a 3-month history of decreased vision, eye pain and floaters in his right eye. His medical history was significant for HIV (recent CD4 count of 799 cells/mm³) and hepatitis C. The patient reported the use of preserved lemon juice to dissolve crack-cocaine for injection.

His visual acuity was hand motions OD and 20/20 OS. Dilated fundus examination of the right eye was obscured by 3+ vitritis, but there appeared to be a large infiltrate in the macula. A vitreous aspiration was performed, with intravitreal injections of ceftazidime (2 mg/0.1 ml) and vancomycin (1 mg/0.1 ml) in the right eye. The vitreous aspirate grew *C. albicans*. New York: Oxford University Press, 1998:478–91.

Changes in the retinal inner limiting membrane associated with Valsalva retinopathy

S K Gibran, N Kenawy, D Wong, et al.

Br J Ophthalmol 2007 91: 701-702
doi: 10.1136/bjo.2006.104935

Updated information and services can be found at:
http://bjo.bmj.com/content/91/5/701.full.html

These include:

References
This article cites 4 articles
http://bjo.bmj.com/content/91/5/701.full.html#ref-list-1

Article cited in:
http://bjo.bmj.com/content/91/5/701.full.html#related-urls

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/