Managing diplopia secondary to scleral buckle surgery

Abstract

A post-scleral buckle surgery patient presents with complaints of diplopia and depth perception issues. This case outlines the systematic approach used to investigate possible sequelae of scleral buckles contributing to the aforementioned symptomology.

I. Case history

- Patient demographic: 64-year-old WM
- Chief complaint: intermittent diplopia and depth perception issues since retinal detachment repair OD 1 year ago. Diplopic images are diagonal and different sizes.
- Ocular history: idiopathic macula-off rhegmatogenous retinal detachment 1 year ago with successful scleral buckle repair. Pseudophakia OU.
- Medical history: hypertension, history of thoracic aneurysm, GERD
- Medications: Pravastatin, Omeprazole, Clopidogrel

II. Pertinent findings

- EOMS: full and without restriction OD/OS
- Pupil testing: PERRL (-) APD
- CVF: mild inferior–nasal and superior-nasal restrictions OD, FTFC OS
- Amsler grid: full without distortion or scotomas OD/OS
- Refraction: OD -0.25-2.75 x 45  BCVA 20/20-
  OS pl-1.25 x 180  BCVA 20/20
- DCT: small IRXT and small IRHT
- NCT: moderate IRX’T and small IRHT
- Distance Maddox Rod: 3 exo, 2.5 right hyper
- Near Maddox Rod: 10 exo, 2.5 right hyper
- Stereopsis: RDS 250’’, WC 40’’
- Keratometry: OD 47.12 @128/45.87@38
  OS 46.76 @76/45.25@166
- Macular OCT: normal foveal contour and thickness OD/OS

III. Differential diagnosis

- Strabismus secondary to scleral buckle impingement on right superior oblique muscle
- Loss of peripheral fusion secondary to retinal detachment-related visual field defect causing decrease in binocular stability and decompensated phoria
- Aniseikonia secondary to new anisometropia induced by scleral buckle
- Macular disruption or atrophy after detachment and repair causing metamorphopsia

IV. Diagnosis and discussion

- Strabismus may develop in up to 50% of patients who undergo scleral buckle retinal detachment repair. These deviations are most often temporary, resolving within 6 months. The strabismus may be caused by decompensated heterophorias, macular damage, aniseikonia due to induced myopic shifts of the affected eye or physical damage to the extra ocular muscles during surgical procedures (Rabinowitz et al. 2013).
- Macula-off retinal detachments, even when successfully repaired, have potential to cause macular translocation once the retina is re-attached. This may prevent proper bifoveation and prevent fusion. Additionally, anisometropia and resulting aniseikonia are both factors known to disrupt fusion, with the likelihood of this increasing as the spherical equivalent difference between the two eyes increases. Some factors that have been found to increase the risk of these adverse effects are increased circumferential dimension of the tear, larger tear area and macular status during detachment. The incidence of aniseikonia after retinal detachment repair is 35%, distortion 23% and diplopia 18% (Watanabe et al. 2014).
- Aniseikona may be present in up to 50% of all patients with rhegmatogenous retinal detachment repairs. Of patients with a history of macula-off detachments, the majority experienced micropsia (Okamoto et al 2014.).
- Analysis of patients with secondary strabismus after scleral buckle surgery revealed that it was most often caused by a mechanical restriction of one or more extraocular muscles. When this was found to be the cause of diplopia, the majority of patients were able to achieve comfortable fusion with use of prism lenses (Goezinne et al. 2012).

V. Management and treatment

- During entrance testing, metamorphopsia secondary to physiologic changes to the macula was ruled out with normal Amsler grid results and record review of macula OCTs from the referring ophthalmology clinic showing the fovea was flat and intact.
• As strabismus was likely the primary causative factor of intermittent diagonal diplopia, binocularity was addressed first.

• Using the Maddox Rod method, the minimum amount of prism to provide both horizontal and vertical alignment was found to be 6 PD BI and 2 PD BD OD. This amount of temporary Fresnel prism was applied to the patient’s habitual glasses.

• At one-week follow-up, the patient reported only a slight reduction in frequency of intermittent diplopia. He also reported that the size difference of the disparate images was more troubling than having the double vision itself.

• The complaints of aniseikonia seemed to stem from the increase in irregular refractive astigmatism OD induced by the scleral buckle.

• In an attempt to alleviate the aniseikonia, a rigid gas permeable contact lens fitting was completed for both eyes.

• While wearing a front toric RGP OD and spherical RGP OS, the patient reported single and clear vision with a reduction in aniseikonia on alternate cover test.

• Binocular testing, completed while the patient was corrected with RGP contact lenses, revealed that the small IRHT and moderate IRXT persisted but with decreased incidence. The patient, however, reported an immediate and significant improvement in symptoms. Remediating the dissimilarity in image size had assisted in improving the patient’s fusional capabilities and improved his sense of depth perception.

• At one-week follow-up, the patient reported a large improvement in symptoms. Diplopia was still experienced on occasion but was no longer bothersome to the patient. He was offered glasses with prism to wear over the contacts, which when trialed did improve ocular alignment. He was, however, content with the contact lenses alone and declined the prism lenses.

VI. Conclusion

• Even successful scleral buckle retinal detachment repair may have subtle but persistent sequelae. Optometrists should be aware of these possible conditions, including induced refractive myopic or astigmatic changes leading to anisometropia and aniseikonia, various binocular issues such as strabismus, and physiologic retinal or macular changes causing metamorphopsia. Optometrists should consider the testing utilized in this case report to distinguish between the aforementioned mechanical and sensory conditions, and manage the patient appropriately to improve the patient’s visual and binocular functioning.

REFERENCES

• Goezinne F et al. “Diplopia was not predictable and not associated with buckle position after scleral buckling surgery for retinal detachment.” Retina. 2012;32:1514-1524.