

Spontaneous globe subluxation: a dramatic complication in contact lens fitting

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INTRODUCTION

- Spontaneous globe subluxation occurs when the globe is displaced anterior to the orbital rim beyond the retracted lids.
- During the episode, patients are unable to close their eyes due to spasm of the orbicularis oculi, which also limits extraocular movement.
- Risk factors for globe subluxation include exophthalmos, floppy eyelid syndrome, thyroid orbitopathy and Crouzon's syndrome¹⁻⁴.
- Mechanical maneuvers such as lid manipulation, general anesthesia, contact lens insertion and removal and trauma are known to precipitate globe subluxation⁵⁻⁶.
- Reported complications include exposure keratopathy, corneal abrasion and trauma optic neuropathy⁷.
- Globe subluxation is one condition among many that complicate contact lens fitting and could potentially lead to contact lens dropout due to difficulty with insertion and removal.



Figure 1. Globe subluxation.
Picture on the left adapted from Globe Subluxation: Review and Management, Review of Ophthalmology. Picture on the right adapted from Reichman's Emergency Medicine Procedures, Third Edition.

CASE PRESENTATION

Patient demographics

26 year old black female

Chief complaint

- Monocular vertical ghost images OD/OS
- Dry eyes

Ocular history

- Keratoconus OU
- Thyroid eye disease OU
- Exposure keratopathy OU

Medical history

- Hyperthyroidism

Medications

- Tapazole
- Selenium
- OTC artificial tears

VA in specs	20/50-2 OD, 20/400 OS
Palpebral fissure	12 mm OD/OS
Exophthalmometry	27.5 mm OD, 26.5 mm OS
Slit lamp findings	Apical stromal thinning and scarring and mild SPK OU
Corneal topography	Moderate apical steepening OU

CASE PRESENTATION

- The patient was fitted with scleral lenses to both mask for corneal irregularity from keratoconus and to treat dry eye disease secondary to exposure keratopathy.
- During an insertion attempt of the first scleral trial lens, the patient's right globe subluxed. Patient was immediately comforted and reassured the non-emergent nature of globe subluxation. After instillation of 0.5% proparacaine, the subluxed globe was reduced by applying manual traction of upper and lower lids and applying gentle direct pressure on the globe. After the reduction, the patient reported immediate relief of pain and return to normal vision.
- With careful and minimal retraction of the upper lid, scleral trial lenses were successfully inserted into the patient's eyes without globe subluxation. The best corrected visual acuity with the scleral trial lens was 20/25 in the right eye and 20/20 in the left eye. The patient reported elimination of vertical ghost images.
- A relatively small diameter of 15.6 mm was selected. The fit assessment showed adequate corneal clearance with well-aligned edges without impingement of lift on the sclera.
- Lenses were ordered with the appropriate over refraction and hydra-PEG coating to improve lens surface wettability and decrease dryness symptoms.
- When the patient returned for the dispensing visit and insertion and removal training, she was instructed to avoid aggressive lid manipulation during insertion. Favourably due to the patient's large apertures, she was able to insert the lenses without fully retracting the upper lid.
- The patient was counselled on lateral tarsorrhaphy and orbital decompression as means to prevent recurrent globe subluxation, however she was not interested at the time.
- The lenses were dispensed and the patient was advised to build up wear time in one hour increments from two hours on the first day.
- At the one month followup visit, the patient reports excellent vision and comfort with the scleral lenses and no difficulty with insertion and removal. She also noted improvement in dryness and less dependence on artificial tears. Visual acuities and lens fit were stable.

CONCLUSION

Globe subluxation is an alarming and anxiety-provoking event that eye care providers should respond quickly to reposition the globe. It is one among several factors that complicate contact lens fitting and wear due to difficulty with contact lens insertion and removal. Contact lens patients with a history of globe subluxation perhaps should be fitted with looser and smaller diameter scleral lens. These patients should be trained on appropriate insertion and removal as well as appropriate repositioning techniques. Underlying diseases such as Grave's orbitopathy or space-occupying orbital lesions should be ruled out in patients without known diagnoses. Surgical treatment such as lateral tarsorrhaphy and orbital decompression should be considered in order to avoid recurrences.

DISCUSSION

- Scleral lenses have been proven to be effective in the management of corneal disorders and ocular surface diseases. They neutralize corneal ectasia and improve visual acuity and quality of vision by providing a smooth and regular refractive surface. The lenses also shield the corneal epithelium from frictional forces of the eyelids while the tear reservoir theoretically helps to maintain and support the function of the corneal epithelium⁸⁻⁹.
- Oftentimes, the insertion and removal of the large diameter scleral lenses present an obstacle for the patients, particularly in patients with decreased corneal sensitivity¹⁰, low vision, problems with manual dexterity, ocular anatomical issues and patients of young age¹¹.
- Modifications with insertion and removal training as well as the contact lens parameters could be helpful in patients with difficulty inserting and removing the lens. For example, contact lens patients with a history of globe subluxation could potentially benefit from a looser and smaller diameter scleral lens and less aggressive lid holding during contact lens insertion.
- In addition to insertion and removal training, patients with a known history of globe subluxation should perhaps be trained on repositioning techniques. Tse has proposed one quick maneuver is to instruct the patient to maintain downgaze; while pinching the upper eyelid skin with two fingers of one hand, the index finger of the other hand makes contact with superior scleral surface while pushing the globe downward and backward¹².
- Increasing the number of training sessions also increase insertion and removal success; a minimum of three and maximum of six sessions were required for training of lens insertion and removal in patients aged 8 to 16 years¹¹.
- A scleral lens stand could be used to maximize lid control with both hands, and the option of having a light in the stand is particularly helpful in guiding direction of application in low vision patients.



Figure 2. Repositioning technique.
Left, front view and right, side view.
Picture adapted from Figure 1, in A Simple Maneuver to Reposition a Subluxed Globe by David T. Tse.

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