Title: Double Trouble: Alleviating Variable Diplopia with Monovision Contact Lenses in A Patient with Multiple Sclerosis and Myasthenia Gravis
Shelly E. Lomax, OD and JulieAnne M. Roper, OD, MS

Abstract
Symptoms of diplopia and ptosis in a patient with multiple sclerosis lead to the rare concurrent diagnosis of myasthenia gravis. When traditional treatments are unsuccessful in alleviating incomitant diplopia, monovision contact lenses should be considered.

I. Case History
Demographics
69-year-old Caucasian male
Chief complaint
Double vision with horizontal, vertical, and torsional components
Ocular history
Diplopia
Ptosis
Pertinent medical history
Myasthenia Gravis (MG)
Multiple Sclerosis (MS)
Medications
Pyridostigmine bromide
Avonex
Other salient information
Right side progressive muscle weakness with very limited movement
Dependent upon wheelchair

II. Pertinent findings
Clinical
EOMs: FROM OU, lagging movement OS
Habitual Rx: +1.75-0.50x080 OD, +1.50-1.00x088 OS, +2.50 add OU
Cover test in primary gaze: 8-10^LH, 6^RET at distance, 6^LH, 4 XP at near (variable)
Alternating XT at near 1 month prior
Cover test in 9 positions of gaze: incomitant deviation
Von Graefe: 8-10^LH, 6^RET at distance, 6^LH, 4 XP at near (variable)
4^RH at distance 1 month prior
Physical
Ptosis OD>OS
Right side muscle weakness
Wheelchair dependent
Laboratory studies
Positive blood test for Acetylcholine receptor binding, blocking, and modulating antibodies.
Radiology studies
MRI: Multiplanar images of the brain, including T1 weighted post gadolinium contrast images revealed multiple focal areas of abnormal signal intensity at the deep white matter of the periventricular regions bilaterally. The number and size of the lesions increased from the MRI brain scan 7 years prior. Several similar appearing focal areas of abnormal
signal intensity had developed in the pons and medulla of the brainstem as well as in the
deep white matter of both cerebellar hemispheres since the previous MRI brain scan.
These findings are radiographically consistent with the clinical diagnosis of MS.

Electrodiagnostic testing
Single-fiber electromyography of the left facial nerve/frontalis shows greater than 10%
decrement post exercise consistent with a disorder of the neuromuscular junction as in
MG.

III. Differential diagnosis
Primary
Transient diplopia secondary to MG and MS
Others
Decompensated phoria
Convergence or divergence insufficiency
Spasm of accommodation or convergence
Ischemia of extraocular muscles
TIAs involving the vertebrobasilar system
Superior oblique myokymia
Ocular neuromyotonia
Cyclic esotropia
Skew deviation

IV. Diagnosis and discussion
• A newly noted ptosis and variable diplopia in our patient with MS warranted
  further serological and electrodiagnostic testing that revealed a concurrent
diagnosis of MG.
• Despite systemic treatment by neurology, the patient was plagued by persistent
diplopia.
  o Cover test findings in 9 positions of gaze revealed an incomitant deviation
    of varying magnitude and direction over several visits.
  o Due to the variable deviation, alignment was unable to be achieved with
    prism. Patching had relieved symptoms for several months until the
    patient became intolerant due to irritation.
  o The patient was reconsulted to neurology for consideration of medication
    adjustment, but neurology deferred increasing the pyridostigmine.
• The patient’s awareness of suppression to reduce symptoms of double vision
  prompted fitting with contact lenses in a monovision modality.
  o The dissociation properties of the monovision lenses were able to
    completely alleviate the patient’s diplopia symptoms.
  o Despite the patient’s physical limitations of severe right side muscle
    weakness, the patient was able to perform insertion and removal of soft
    contact lenses.

V. Treatment, management
Treatment
• The dual diagnosis of MS and MG is not only rare and unfortunate, but can also
  lead to ocular manifestations that can be challenging to manage.
• The literature discusses treatment options for the variable diplopia that can be
  associated with MG including oral medications, surgery, and prism.
However, our patient became intolerant to all historically standard treatment options.

There are documented cases of relieving diplopia by means of disparity such as in monovision contact lenses, including one case report of a patient with a significant vertical imbalance.

- We decided to apply this concept to our patient’s incomitant diplopia as a new, unique treatment for ocular MG that would eliminate the need for patching.
  - This less traditional option of monovision contact lenses proved to be the only viable option for our patient and successfully alleviated our patient’s symptoms.

Bibliography

- As MG typically presents with ocular symptoms, the optometrist can play an important role in diagnosis and management of these patients.
- 18+ articles on MG diagnosis, treatment, and management, including:

VI. Conclusion
Clinical pearls

- The possibility of dual systemic disease processes causing ocular complications should not be neglected, and further testing should be done when a second disease process with potentially serious complications is suspected.
- As in our case, MG should be considered in patients with MS who have fatigue, diplopia, or ptosis.
- Instead of traditional patching, monovision contact lenses to alleviate incomitant diplopia may be considered as a unique treatment option for patients with MG and MS.