

Article • Monocular Partial/Sector Occlusion Therapy: A Procedure to Inhibit Diplopia in Thyroid-Associated Ophthalmopathy

Lawrence A. Routt, OD • Kosciusko, Mississippi



Lawrence A. Routt, OD
Kosciusko, Mississippi

Optometrist, Routt Eye Clinic; Shepherd's Touch

OD, Southern College of Optometry, 1977
BS, Zoology, UT, Knoxville, 1971

ABSTRACT

Background: A condition generally associated with hyperthyroidism, thyroid-associated ophthalmopathy may present with signs that vary from patient to patient. Diplopia is one of the most common and debilitating of manifestations, and it can be difficult to treat effectively.

Case Report: An adult female presented with thyroid-associated ophthalmopathy, complaining of “bulging, dry, gritty” eyes (OS worse than OD) and double vision when looking to the extreme right or left. Two weeks of dry eye therapy OU was successful, but intermittent diplopia persisted. The patient indicated that the diplopia was “not bothersome.”

Eight weeks after the initial examination, the patient reported constant diplopia in primary gaze that threatened her ability to remain independent. Prism was of no benefit. Occlusion of a whole spectacle lens resolved the diplopia, but she felt unsafe driving. Thus, a procedure was devised to occlude only the precise sector of one spectacle lens as needed to inhibit the constant binocular diplopia. This allowed the use of the total effective visual field of both eyes in primary gaze, enabling the patient to drive safely and to remain independent.

Conclusion: Diplopia in thyroid-associated ophthalmopathy often varies from intermittent to constant, with or without spontaneous resolution. If binocular diplopia is constant, and prism is determined to be of no benefit, monocular partial/

sector occlusion of a spectacle lens may be a viable option for inhibiting the diplopia. This occlusion therapy is unique in allowing optimal use of the total effective visual field of both eyes, and it can be used temporarily or chronically as needed.

Keywords: diplopia, exophthalmos, Graves' ophthalmopathy, hyperthyroidism, occlusion therapy, thyroid eye disease

Introduction

The thyroid is a butterfly-shaped gland composed of two lobes near the front of the neck lying against and around the front of the larynx and trachea.¹ The primary function of the thyroid is the production of hormones, which have a wide range of metabolic, cardiovascular, and developmental effects. Thyroid hormones help maintain normal sexual function, sleep, and thought patterns.^{2,3}

Thyroid-associated ophthalmopathy (TAO) generally occurs in patients with hyperthyroidism or a history of hyperthyroidism due to Graves' disease. The close clinical and temporal relationships between hyperthyroidism, thyroid-associated ophthalmopathy, and thyroid dermopathy suggest that these conditions evolve from a single underlying systemic process with variable expression in the thyroid, eyes, and skin. Bilateral ocular symptoms and hyperthyroidism most often occur at the same time or within 18 months of each other, although TAO occasionally precedes or follows the onset of hyperthyroidism by many years.⁴⁻⁶

Varying manifestations of TAO include proptosis, upper eyelid retraction, swelling (with or without erythema of the periorcular tissues, lids, and conjunctivae), and extraocular muscle dysfunctions that may cause diplopia.⁴⁻⁸ TAO is reported to occur in 25-50% of those with Graves' disease, an autoimmune disorder that causes hyperthyroidism. Eighty to ninety percent of those with Graves' ophthalmopathy, also called thyroid-associated ophthalmopathy, have hyperthyroidism, though some have euthyroidism or hypothyroidism primarily caused by Hashimoto thyroiditis. Please note the following distinction: Graves' disease is systemic and causes hyperthyroidism, whereas Graves' ophthalmopathy is ocular and may or may not be associated with hyperthyroidism.^{6,9,10}

Regardless of the disease process, diplopia is well known to affect quality of life significantly and may threaten a patient's safety and ability to function independently.¹¹

Although TAO is often identified by other names, the signs are the same for each, as just discussed. Names assigned to TAO in the current literature include the following: thyroid-associated ophthalmopathy⁶ or orbitopathy,⁷ thyroid ophthalmopathy^{8,9} or orbitopathy,⁵ dysthyroid ophthalmopathy^{4,12} or orbitopathy,¹³ Graves' ophthalmopathy^{6,9,11} or orbitopathy,^{6,7,14} and thyroid eye disease.^{4,7}

Extraocular muscle instability in TAO is often associated with the progression of intermittent to constant diplopia, with or without spontaneous resolution.^{4-8,11,12,14,15} Although patients with TAO may not be bothered with the early onset of intermittent double vision, they typically want constant diplopia resolved immediately. Unfortunately, traditional care using prism may be of no benefit due to instability and variability of the nature of the diplopia.^{5,8} Occlusion of a whole spectacle lens or eye may provide immediate resolution of binocular diplopia, but patients with normal or near-normal best visual acuity (OD and OS) are often displeased with the loss of a binocular visual field. While binasal occlusion in TAO may inhibit constant binocular diplopia, a significant central scotoma may result. This may be profound when there is an inability of the extraocular muscles to move the eyes OU in any direction from primary gaze. For such patients, monocular partial/sector occlusion (MPSO) of a spectacle lens may be a sensible alternative. The procedure is effective, and patients find adaptation quick and easy. Also, MPSO may allow optimal use of the total effective visual field of both eyes while immediately resolving binocular diplopia temporarily or chronically as needed. If occlusion therapy to inhibit diplopia in TAO is not effective or is rejected, strabismus surgery may be considered. However, some patients may be poor candidates or may not be stable enough for surgery, and some may simply prefer no surgery.^{5,8,16} Surgical treatment of strabismus is only indicated in longstanding, unchanged misalignment for more than six months.⁵

Case Report

A 71-year-old female presented saying that, about two months earlier, she had seen her family nurse practitioner for lower gastrointestinal distress, elevated blood pressure, tachycardia, weight loss, edema of the feet and ankles, dry eyes, and severe eyelid

edema with ptosis of both eyes. She was referred to an endocrinologist, who confirmed the diagnosis of Graves' disease with hyperthyroidism. Following initiation of treatment with methimazole 10 mg PO qd, propranolol 20 mg PO tid, and selenium 200 mcg PO qd, the patient said that her systemic signs and symptoms remained the same for about six to eight weeks. In addition, she reported frequent, debilitating fatigue with minimal exertion, lethargy, and episodes of nervousness. She indicated an increased "dry, gritty" feeling of both eyes and "bulging" of her eyes, OS worse than OD (Figure 1). She was instilling artificial tears OU prn. She reported an onset of intermittent diplopia (on looking to the extreme right or left) that was worse in the mornings and with fatigue. This is common in TAO,⁴ but she said it was "not bothersome." Based on known Graves' disease with hyperthyroidism and the ocular findings to follow, the diagnosis of TAO was made and discussed with the patient. She voiced a preference of avoiding taking systemic steroids or having any ocular, orbital, or other invasive procedures.



Figure 1. Exophthalmos, OS worse than OD

Findings on initial eye examination were as shown in Table 1. Because the patient's chief ocular complaint remained the dry, gritty foreign-body sensation of both eyes, treatment was modified as follows: instill preservative-free artificial tears 1 gt OU q2h, apply a small amount of preservative-free lubricating ophthalmic ointment OU at bedtime, and tape eyelids shut with surgical/paper tape OU at bedtime.

The patient returned for follow-up two weeks after the initial eye examination. She indicated compliance with the lubricating drops and ointment OU but self-modified the eyelid taping suggestion at bedtime. Instead of tape, she was covering her closed eyes with a "fold of cellophane held in place with a bandanna" as that "stayed in place much better overnight." While her eyes "felt better," she said that there was no change in the intermittent diplopia on looking to the extreme right or left. It was "not really bothersome....just had to turn [her] head more to prevent the double vision."

Findings at two weeks after the initial eye examination were as shown in Table 2.

Table 1. Exam Data from Initial Evaluation

Unaided visual acuity	OD and OS 20/25 ⁻²
Spectacle Rx	OD: pl-1.00x083, 20/25 +2.25 add, 20/25 OS: -1.00 sph, 20/40 ⁻¹ +2.25 add, 20/40.
Ocular motility	Up, right, and left gaze moderately constricted with each eye; down gaze normal in each eye
Alignment	Mild esotropia/hypotropia of approximately 10 [^] eso and 10 [^] hypo OS (estimated by Purkinje image; 1 mm asymmetry=22 [^]) both in left and right gaze Normal alignment with fusion and gross stereopsis in primary gaze
Visual fields	Full to confrontation OD and OS
Amsler grid	Normal OU
Color vision	Normal OU
Pachymetry	593 OD, 609 OS
IOP	21/23 tonopen, 10:26 am 22/24 tonopen, 10:27am
Anterior segment	Trace to mild diffuse conjunctivitis OS > OD Inferior, horizontal band of trace SPK OD Inferior, horizontal band of #1.5 SPK OS 1+ anterior subcapsular and nuclear sclerotic cataracts OU Lagophthalmos OD = 1.0 mm fissure between sup/inf lid margins OS = 2.0 mm fissure between sup/inf lid margins Eyelid retraction: left upper lid worse than right upper lid (Figure 2)
Posterior segment	C/Ds = 0.1/0.1, optic discs flat and normal; fundus evaluation normal
Exophthalmometry	21 mm OD, 23 mm OS (normal = 15.4 white female) ¹⁷

**Figure 2.** Eyelid retraction, left upper eyelid worse than right upper eyelid

There was no change in dry-eye therapy. As the tachycardia resolved, the endocrinologist instructed the patient to taper off the propranolol, to continue methimazole 10 mg PO qd and selenium 200 mcg PO qd, and to begin azelaic acid 20% topical cream bid or less frequently prn for rosacea.

At 8 weeks after the initial eye examination, the patient presented with a chief complaint as follows: “The double vision has definitely gotten more frequent in the last two weeks. Now, there is a constant separation of objects when looking straight ahead.” Because she lived alone in a rural area, which requires driving for essential services and materials, she needed immediate relief from the diplopia. In an effort to cope, the patient had discontinued her prescription lined bifocals except for reading. Of her own accord, she had purchased a pair of single-vision OTC sunglasses, removed the right lens, and applied frosted cling wrap to the whole left spectacle lens. Without a bifocal spectacle lens OD, she had a larger vertical visual field at distance OD, which she appreciated, especially since her eyes would not elevate from primary gaze. Binocular diplopia was resolved with the whole left lens occluded, but she did not feel safe driving.

At 8 weeks after the initial eye examination, there was no change in refraction OU. The only changes in findings are shown in Table 3. There was no change in dry-eye therapy. Thyroid hormone levels were normal. The endocrinologist instructed the patient to taper to methimazole 10 mg PO qd alternating with 5 mg qod, to continue selenium 200 mcg PO qd, and to continue azelaic acid 20% topical cream bid or less frequently prn for rosacea.

I explained to the patient that single-vision lenses with a distance prescription would enhance the visual acuities and allow optimal vertical visual fields in chin-lift position. This would improve vision since both eyes were unable to move up from primary gaze. Because prism was determined to be of no benefit, and she did not like having a whole spectacle lens occluded, I discussed the potential of MPSO or binasal occlusion to inhibit constant binocular diplopia. I explained that MPSO might allow her to use both eyes with a more normal, total effective visual field.¹⁸

Table 2. Exam Data from Two-Week Follow-Up Evaluation

Unaided visual acuity	OD 20/25 ⁻¹ , OS 20/25 ⁻²
Ocular motility	Now unable to follow penlight up, right, or left OU Normal in down gaze with each eye
Alignment	Purkinje images, fusion, and stereo unchanged
Visual fields	Humphrey full-field 81-point screening: Inferior arcuate scotoma and mild superior nasal defects with enlargement of the blind spot (EBS) OD Inferior arcuate scotoma with EBS OS
Amsler grid	Normal OU
IOP	19/21 tonopen at 3:21pm
Anterior segment	Conjunctiva and cataracts unchanged Cornea: normal OD, grade 1 SPK inferiorly OS Lagophthalmos OD = 1.5 mm fissure between sup/inf lid margins OS = 2.5 mm fissure between sup/inf lid margins Eyelid retraction: upper lid OS worse than upper lid OD
OCT anterior:	Angles normal OU, OCT optic disc cube 200x200: thickening of nerve fiber layers superiorly and inferiorly OU
Exophthalmometry	22 mm OD, 24 mm OS

Table 3. Exam Data from Eight-Week Follow-Up Evaluation

Unaided visual acuity	OD and OS 20/30 ⁺²
Alignment	Fusion or stereopsis in primary gaze: None
IOP	16/18 tonopen at 12:05pm
Anterior segment	Lagophthalmos OD = 1.5 mm fissure between sup/inf lid margins OS = 3.0 mm fissure between sup/inf lid margins
Exophthalmometry	22.5 mm OD, 25 mm OS

Although I emphasized that her double vision could spontaneously resolve with ongoing treatment of the Graves' disease and hyperthyroidism, the patient was eager for a temporary resolution of the constant diplopia that would allow the use of both eyes, especially for driving. The challenge was in determining the most effective way to occlude precisely only that part of the visual field necessary to inhibit the constant horizontal binocular diplopia.

Monocular Partial/Sector Occlusion Therapy: A Procedure to Inhibit Diplopia in Thyroid-Associated Ophthalmopathy

1. Preliminary steps:

- a. Order single-vision glasses with Rx for far.
 1. The patient may be encouraged to select a frame with larger than their usual eye size, since some of the very-small-eye-size lenses will not be adequate for monocular partial/sector occlusion.
 2. If the patient does not require prescription lenses at far, a stock frame with dummy lenses (not to be dispensed) or a frame with OTC +0.50 approved lenses can be used to measure for MPSO.
- b. The patient is seated in the exam chair wearing the single-vision glasses with Rx for far and is instructed to look straight ahead. They are allowed to assume their usual chin-lift position that is common in TAO.^{5,8,12}
- c. A single white spot is projected on the screen directly in front of the patient at 20 ft. They should report seeing two white spots. The spatial relationship of the two spots is documented. They may be side-by-side, vertical, or diagonal to each other.

2. Constant horizontal diplopia: The patient will see two spots separated side-by-side.

- a. As the patient looks straight ahead at the two white spots, a 2"x2" piece of index card is used to begin slowly occluding the spectacle lens, starting at the nasal eyewire of the non-dominant eye.
- b. The patient is requested to indicate when they only see one white spot. The spectacle lens is marked at that point with a fine-tip, erasable marker.
- c. Frosted tape is then applied to the lens from the nasal eyewire to the mark.

3. Constant vertical diplopia: The patient will see two spots separated one above the other.

- a. As the patient looks straight ahead, first determine which eye is seeing the lower of the two white spots (the least hypotropic eye).
- b. Use a 2"x2" piece of index card to begin slowly occluding the spectacle lens, starting at the inferior eyewire of the least hypotropic eye.
- c. The patient is requested to indicate when they only see one white spot. The spectacle lens is marked at that point with a fine-tip, erasable marker.
- d. Frosted tape is then applied to the lens from the inferior eyewire to the mark.

4. Assessment of the MPSO spectacles:

- a. While wearing the MPSO spectacles with the frosted tape, the patient is requested to walk around inside and outside the office.
- b. A binocular confrontation field test can be used to evaluate the patient's effective field of vision while wearing the MPSO spectacles.
- c. If the patient reports that the diplopia has resolved with improved visual comfort, MPSO spectacles are then prescribed for wear.

Upon first wearing the MPSO spectacles in and around the office, the subject of this case report commented, "Amazing, no double vision, and I can see so much better using both eyes..." The single-vision MPSO spectacles successfully inhibited constant horizontal binocular diplopia for about five weeks (Figures 3 and 4). At that time, she reported, "Good news, the diplopia, on looking straight ahead, started to resolve each day for a few hours at a time, as much as 4-6 waking hours, but it would seem to return." About two weeks later, she reported that the diplopia in primary gaze "resolved all week," and the MPSO glasses were no longer needed. However, she said, "the taped glasses were a life saver for driving...I haven't pulled the tape off, in case." For this patient, MPSO was sufficient to inhibit constant binocular diplopia in primary gaze until that ocular manifestation of Graves' disease resolved (15 weeks after her initial presentation for an eye exam). Although she continued to report



Figure 3. TAO case report subject wearing MPSO glasses to inhibit horizontal binocular diplopia



Figure 4. MPSO glasses to inhibit horizontal binocular diplopia in TAO case report subject



Figure 5. MPSO glasses to inhibit vertical binocular diplopia in TAO

intermittent diplopia with extreme right or left gaze, she said it was “not bothersome.”

Fifteen months after being diagnosed with Graves’ disease, hyperthyroidism, and TAO, the patient reports that she feels “fairly good.” She continues systemic treatment with selenium 200 mcg PO qd but has tapered methimazole to 2.5 mg PO qd. She continues azelaic acid 20% topical cream bid or less frequently prn for rosacea. She says, “My eyes have pretty much been the most troubling aspect since day one and throughout.” There has been no change in her dry-eye therapy OU, since any modification has resulted in ocular discomfort. She still reports intermittent diplopia on extreme gaze right or left but says it is “less frequent, sometimes skipping a day or two, and definitely not bothersome.” Her diplopia in primary gaze has never recurred. For TAO patients whose constant binocular diplopia in primary gaze persists, the taped lens can be used as a lab pattern for frosting the precise sector of the spectacle lens required for chronic MPSO therapy.

The subject had horizontal (only) binocular diplopia. Although any individual extraocular muscle can be involved, TAO has the greatest predilection for the inferior rectus muscle, causing hypotropia with a tendency for vertical binocular diplopia. TAO’s second greatest predilection is for the medial rectus muscle, causing esotropia with a tendency for horizontal binocular diplopia.⁴⁻⁸ For a TAO patient with both horizontal and vertical binocular diplopia, the procedure for monocular partial/sector occlusion is the same as just described for horizontal (only) binocular diplopia.

If a TAO patient’s eyes do not elevate adequately from primary gaze, chin lift is often necessary to view targets located superiorly.^{5,8,12} That problem would be exacerbated with occlusion of the superior sector of a spectacle lens. Thus, MPSO is preferably done inferiorly to resolve vertical (only) binocular diplopia in TAO patients with limited movement of the eyes in up gaze (Figure 5).

MPSO therapy to inhibit binocular diplopia in TAO patients is most effective when BVAs are about the

same in each eye. When one eye has a significantly worse BVA than the other, whole occlusion of the dimmer eye may be preferable to MPSO.

Discussion

Despite ocular and systemic treatment of TAO, enlargement and dysfunction of the extraocular muscles, often greater in one eye than the other, can contribute to binocular diplopia.^{5,7,11,12,14} This may progress from intermittent or cyclic (occurring/resolving at regular intervals of time) to constant diplopia that can be difficult to manage.^{11,12} Because patients typically want a quick fix for constant diplopia, it is tempting simply to suggest whole occlusion of the dimmer eye or the more proptotic eye (when BVAs are about the same). This can be done with an eye patch over the appropriate eye, a spectacle lens occluder or frosted lens, or frosted tape that is applied to the appropriate spectacle lens (whole surface). If the patient wears a significant prescription in contact lenses, it may be possible to resolve the binocular diplopia by discontinuing the contact lens for the dimmer eye or more proptotic eye (when BVAs are about the same). If the patient does not wear prescription contact lenses, they may want to consider wearing one with an opaque center in the dimmer or more proptotic eye (when BVAs are about the same). Occlusion of a whole spectacle lens or eye requires little more than a suggestion to the patient, but it may not be the best option for resolving binocular diplopia in TAO. This is especially true for those with normal or near-normal BVAs in each eye who prefer to continue using both eyes with a more normal, total effective visual field.¹⁸

Because the subject of this case report lives alone in a remote, rural area, driving for essential services and materials is necessary. Thus, constant diplopia threatened her independence, as she did not feel safe driving with one whole spectacle lens occluded. MPSO provided immediate relief of the temporary (five weeks’ duration) constant diplopia in primary gaze while allowing the use of both eyes with about 180 degrees total effective horizontal visual field OU. Although there was no fusion or stereopsis, the visual

field of the slightly esotropic OD compensated for the contiguous nasal and central scotoma OS created by the monocular partial/sector occlusion of the left spectacle lens. This was determined with a binocular confrontation field test to evaluate the total effective horizontal visual field.

The prevalence of hyperthyroidism in the United States is 1.2%, the majority of TAO patients have hyperthyroidism,¹⁹ and most TAO is best treated conservatively.²⁰ In those with binocular diplopia, prism may be of no benefit, and occlusion of a whole spectacle lens or eye may be barely tolerated or rejected.¹⁸ For those TAO patients with normal or near-normal BVAs in each eye, MPSO may be a sensible and effective temporary or chronic therapy to inhibit constant binocular diplopia. If occlusion therapy to inhibit diplopia in TAO is not effective or rejected, strabismus surgery may be considered.

Acknowledgements

Much appreciation to the kind lady who was the subject of this case report. Also, thanks to W.C. Maples, OD; Glenn Steele, OD; Teresa Trussell, Wes Carlisle, Cindy Burrell, Bettie Mallett, and Brooke Caldwell. For all the encouragement and support, I thank Joseph Robert Routt.

References

1. Standring S, Borley NR, et al, eds. Gray's Anatomy: The Anatomical Basis of Clinical Practice. 40th ed. London: Churchill Livingstone, 2008:462-4.
2. Colledge NR, Walker BR, Ralston SH, eds. Davidson's principals and practice of medicine. Illustrated by Robert Britton. 21st ed. Edinburg: Churchill Livingstone/Elsevier, 2010:736. ISBN 978-0-7020-3085-7.
3. Hall JE, Guyton AC. Guyton and Hall Textbook of Medical Physiology, 12th ed. Philadelphia, Pa: Saunders/Elsevier, 2011:932-7.
4. Kim EY, Roper-Hall G, Cruz OA. Effectiveness of bilateral lateral rectus resection for residual esotropia in dysthyroid ophthalmopathy. Am J Ophthalmol 2016;171:84-7.
5. Al Qahtani ES, Rootman J, Kersey J, Godoy F, et al. Clinical pearls and management recommendations for strabismus due to thyroid orbitopathy. Middle East Afr J Ophthalmol 2015;22(3):307-11.
6. Bahn RS. Graves' ophthalmopathy. N Engl J Med 2010;362(8):726-38.
7. Hodgson NM, Rajaii F. Current understanding of the progression and management of thyroid associated orbitopathy: A systemic review. Ophthalmol Ther 2020;9(1):21-33.
8. Iliescu DA, Timaru CM, Alexe N, Gosav E, et al. Management of diplopia. Rom J Ophthalmol 2017;61(3):166-70.
9. Stan MN, Garrity JA, Bahn RS. The evaluation and treatment of Graves ophthalmopathy. Med Clin North Am 2012;96(2):311-28.
10. Hiromatsu Y, Eguchi H, Tani J, Kasaoka M, et al. Graves' ophthalmopathy: Epidemiology and natural history. Inter Med 2014;53(5):353-60.
11. Lin TY, Li N, Yeh MW, Leung AM, et al. Prognostic indicators for the development of strabismus among patients with Graves' ophthalmopathy. J Clin Transl Endocrinol 2017;9:38-40.
12. Paik J-S, Yang S-W, Park SH. A cyclic vertical deviation with dysthyroid ophthalmopathy: A case report. BMC Ophthalmol 2016;16:119.
13. Jacobson DM. Dysthyroid orbitopathy. Semin Neurol 2000;20(1):43-54.
14. Zeng P, Fan S-x, Li Z-j, Peng Y-y et al. Evaluation of the Graves' orbitopathy-specific quality of life questionnaire in the mainland Chinese population. J Ophthalmol 2019;2019:7602419.
15. Sabini E, Leo M, Mazzi B, Rocchi R, et al. Does Graves' orbitopathy ever disappear? Answers to an old question. Eur Thyroid J 2017;6(5):263-70.
16. Roncevic R, Savkovic Z, Roncevic D. Results of diplopia and strabismus in patients with severe thyroid ophthalmopathy after orbital decompression. Indian J Ophthalmol 2014;62(3):268-73.
17. Migliori M, Gladstone G. Determination of the normal range of exophthalmometric values for black and white adults. Am J Ophthalmol 1984;98(4):438-42.
18. Routt, LA. Monocular partial/sector occlusion therapy: A procedure to inhibit diplopia in Brown syndrome. Optometry 2011;82:207-11.
19. Pokhrel B, Bhusal K. Graves Disease. NCBI Bookshelf, 2020. Available from <http://ncbi.nlm.nih.gov/books/NBK448195/>. Last Accessed February 22, 2020.
20. Dagi LR, Elliot AT, Roper-Hall G, Cruz OA. Thyroid eye disease: Honing your skills to improve outcomes. JAAPOS 2010;14(5):425-31.

Correspondence regarding this article should be emailed to Lawrence A. Routt, Sr, OD, at iclinic@aol.com. All statements are the author's personal opinions and may not reflect the opinions of the representative organization, OEPF, Optometry & Visual Performance, or any institution or organization with which the author may be affiliated. Permission to use reprints of this article must be obtained from the editor. Copyright 2022 Optometric Extension Program Foundation.

Routt LA. Monocular partial/sector occlusion therapy: A procedure to inhibit diplopia in thyroid-associated ophthalmopathy. Optom Vis Perf 2022;10(1):31-6.
