



Use of the VO Star to Guide Treatment of a Decompensating Esophoria

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PURPOSE

Behavioral optometry often relies upon a mixture of art and science. Clinicians attempting to apply lenses and prisms therapeutically in the treatment of visual dysfunctions can benefit from objective measures which confirm success.

BACKGROUND

The Van Orden (VO) Star has long been utilized as an interpretable objective measure of the patient's perception of visual space.¹⁻³ Improvements documented on VO Star may be observed by both patient and clinician.

The VO Star can be used diagnostically to guide treatment, as well as document progress. VO Star interpretation can support data obtained in a behavioral optometric exam.

CASE REPORT

A 61 year old white male presented for optometric exam with no distinct visual complaints. At the previous exam (1.5 years prior), application of 0.5^ΔBI OS was found to alleviate visual stress, and was incorporated into previous (mild aniso) Rx.

Old Rx:

OD -3.00 sph
OS -3.75 sph = 0.5^ΔBI

On cover test, the patient demonstrated a subtle small angle left esotropia (ET) at distance and near; failed Random Dot stereopsis; Wirt stereoacuity: 70"; slight right head tilt in free space.

Phoroptric testing at distance revealed a 16^Δ esophoria (EP), right hyperphoria, and a reduced compensatory range of fusion. Prior data showed no greater than 6^ΔEP @ distance, increasing magnitude over last four years. Ocular and medical health were unremarkable.

Phoroptric findings indicated BO prism would assist with maintenance of binocular fusion at distance, whereas vertical prism neutralization had limited effect on fusion ranges:

c DV Balance	c 1.5 ^Δ BU OS
BI x / 1 / -8	BI x / 1 / -5
BO x / 18 / 15	BO x / 18 / 13

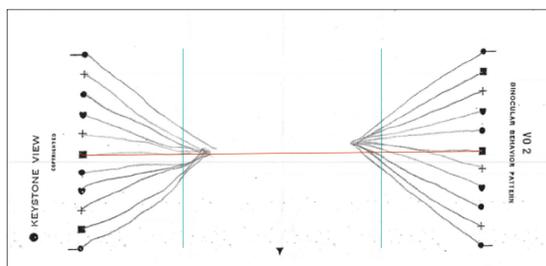


Figure 1: Baseline, Old Rx. Reduced visual organization OS relative to OD, slightly open OS grasp. Right hyperphoria.

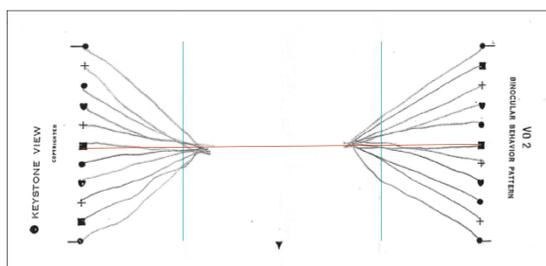


Figure 2: Baseline. No Rx. Eso OU, right hyperphoria.

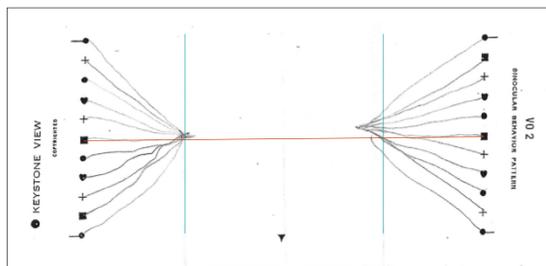


Figure 3: New Rx on dispense. Reduced eso OU, ortho OS, right hyperphoria.

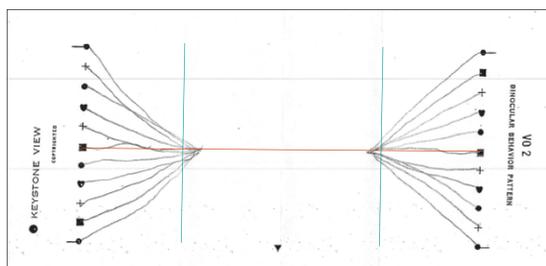


Figure 4: New Rx after 3-4 weeks wear. Symmetric posture, reduced eso, no hyper.

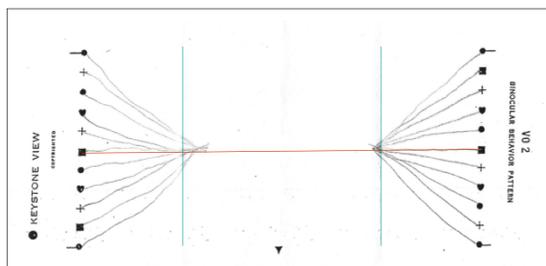


Figure 5: New Rx after 6 months wear. No hyper.

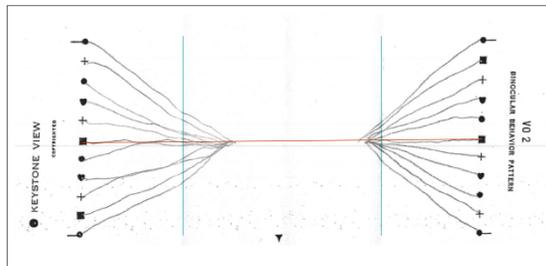


Figure 6: Old Rx, retested at 6 month visit: Provokes immediate eso projection OS.

VO Stars

VO Stars were obtained as a baseline measure with current Rx (Figure 1) and without Rx (Figure 2). Significant eso-projection was observed OU, along with right hyperphoria, both with and without Rx. Reduced visual organization OS relative to OD, with a slightly open grasp OS.

The 4^ΔBO Test indicated OS suppression. However, patient reports relief of tension with prism in front of OS.

Trial frame revealed best acceptance of BO prism applied OS only (4^ΔBO). Split prism (2^ΔBO OU) was rejected, and 3^ΔBO OS was insufficient for tension relief.

New Rx:

OD -3.00 sph
OS -3.75 sph = 4^ΔBO OS only

VO Star was obtained on dispense of new Rx (Figure 3). Immediate positive response to Rx is observable, with unilateral reduction in eso projection OS, improved grasp and more symmetric organization. Right hyperphoria persists.

One-month follow-up visit and binocular re-assessment was scheduled to evaluate impact of therapeutic Rx worn full time. VO Star revealed shift towards a balanced, ortho projection and elimination of hyper component with new Rx.

Six-month follow up, VO Star obtained with both new and prior Rx: Performance with 4^ΔBO OS: close to ortho projection; slightly more eso OS; left side overflow; neutralized hyperphoria (Figure 5). Retest with "old" Rx (same visit, Figure 6) shows immediate increase in eso projection OU, OS >> OD; poor organization OS.

Unilateral prism has been maintained in Rx for 3 years, Wirt stereoacuity, 30".

CONCLUSIONS

The VO Star can be a valuable tool in the objective assessment of the impact of lenses and prisms on visual behavior.

Unilateral application of prism in a decompensating small angle ET can help the patient to recover visual balance and stability.

ACKNOWLEDGMENT: Special thanks to Stefan Collier, for his guidance, training, and support in the art of VO Star interpretation.

¹ Byall, Robert. "Interpretation of the Van Orden Star" in: Visual Training at Work. May, 1955, Vol. 4, No. 8.

² The Collected Works of Lawrence W. MacDonald, O.D., Volumes 1 and 2. 1954-1965 and 1968-1979. Optometric Extension Program

³ Kaplan, M. & Lydon, C. The Van Orden Star: A Window into Personal Space. *Journal of Optometric Vision Development*, 2002; 33(1), 21-28.