

# **The Role of Biofeedback, Prism, and Vision Therapy in the Treatment of Oscillopsia in Congenital Nystagmus**

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## **Abstract:**

Biofeedback therapy, prism, and vision therapy are common treatments for congenital nystagmus. This poster presents a 23 y/o female with congenital nystagmus who develops symptoms of oscillopsia after enucleation of her left eye.

## **I. Case History**

- Patient: 23 y/o Hispanic female
- Chief complaint: oscillopsia secondary to congenital nystagmus
- Ocular History:
  - Congenital nystagmus since birth
  - Congenital cataract OS s/p extraction at age 3 months
  - History of constant esotropia OS reportedly developed following cataract surgery
  - History of retinal detachment OS with pain and pressure leading to enucleation OS in 2009
  - Shell prosthetic OS since 2009
- Medical History: unremarkable
- Medications: None
- Other salient information:
  - This patient presented to the clinic four years after the enucleation complaining of symptoms of oscillopsia, dizziness and difficulty sustaining near work that all began following the enucleation of her left eye

## **II. Pertinent Findings**

- OD dva c 20: 30- (with face turn to right, pt uncomfortable)
- OD nva c 20: 20-
- EOMs: OD nystagmus, worse in right gaze, null point in left gaze, remains constant during up and down gaze; OS prosthetic moves minimally. Nystagmus worse in distance, and at night/low light condition
- Previous clinical findings in 2007 prior to OS enucleation:
  - EOMs: Jerky on abduction, outbeating nystagmus OU, dampens on convergence, Constant LET with nystagmus greatest upon monocular occlusion

## **III. Differential Diagnosis**

- Manifest Latent Nystagmus
- Central Vestibular Nystagmus

- Peripheral Vestibular Nystagmus
- Physiologic Nystagmus

#### **IV. Diagnosis and Discussion**

- Diagnosis: Congenital Nystagmus OD with oscillopsia s/p OS enucleation
- Congenital nystagmus (CN) is characterized by abnormal, involuntary, rhythmic ocular oscillations that occur independently of and superimposed upon one's normal eye movements
- Classical clinical features of congenital nystagmus include oscillations that are conjugate and horizontal, remaining horizontal in up and down gaze, worsening with fixation, and dampening with convergence. Other features include a latent component in which the nystagmus increases with one eye covered and a null point in which the nystagmus dampens or stops in a certain position of gaze
- It is a misconception that a key reliable feature of congenital nystagmus is the absence of oscillopsia. While it is true that a patient with a primary complaint of oscillopsia should be assumed to have an acquired condition until proven otherwise, it is not true that oscillopsia never occurs in congenital nystagmus
- In a large retrospective sample, Abadi and Bjerre reported that nearly 40 per cent of their patients at least occasionally experienced the perception that their environment was moving
- In a smaller study by Tkalcevic and Abel, it was found that 12 of 16 congenital nystagmus patients reported occasional instances of oscillopsia. Most of the instances were associated with exacerbations of their nystagmus by fatigue, illness, stress or looking in their 'non-preferred' gaze direction. Changes in a patient's condition that exacerbate the nystagmus may also lead to the onset of oscillopsia.
- When comparing this patient's EOM testing prior to enucleation and post enucleation, it can be hypothesized that the change in the patient's visual condition caused visual stress and exacerbated the nystagmus. Prior to enucleation, the nystagmus increased with occlusion and dampened with convergence. When monocular, the latent component of the nystagmus is constantly presented and without the signal from OS to converge, the nystagmus does not dampen. There is also less visual reference field to stabilize the image, so nystagmus is worse

#### **V. Treatment and Management**

- Prescribed near vision glasses with 5 PD base out OD ground-in prism to put eyes at null point
- Recommended biofeedback therapy and vision therapy to improve fixation and eye movement control
- Traditionally, vision therapy procedures utilized to lessen or eliminate symptoms of nystagmus include (a) vision therapy using anti-suppression and fusional vergence to

enhance fusion and (b) biofeedback techniques to increase voluntary control of the nystagmus and stabilize fixation. Because this patient is monocular, the therapy techniques used in her training program only include those that fall in the second category

- The primary mode for biofeedback therapy was performed using the ReadAlyzer 2012 eye movement recording system. This device provided visual feedback of the patients nystagmoid eye movements allowing her to alter the visual motor output and stabilize eye movements
- Vision therapy techniques included line counting, Hart Chart saccades, Michigan tracking, Wayne Saccadic Fixator
- After 20 sessions, the ReadAlyzer eye movement recording system demonstrated a reduction in the frequency of nystagmus while in primary gaze and increased control of eye movements when engaged in cognitive tasks such as conversation
- The patient reported an improvement in her symptoms, especially oscillopsia and fatigue associated with reading. While using the prism reading glasses, she reported being able to sustain reading for 25 minute without fatigue or oscillopsia
- She also reported an improvement in her ability to fixate on objects and people without the perception of oscillopsia as well as her friends and family members noticing greater stability of her eye movements

## **VI. Conclusion**

This case demonstrates the effectiveness of a multimodal approach in the treatment of congenital nystagmus. The use of prism, biofeedback, and vision therapy resulted in a reduction in oscillopsia, enhanced eye movement control and significant improvements in this patient's overall functionality and confidence.

## **VII. Bibliography**

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