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NEURO-OPTOMETRIC REHABILITATION OF A PATIENT WITH MULTIPLE CONCUSSIONS AND PRESUMED VIRAL MENINGITIS: A CASE REPORT

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ABSTRACT

A 39-year-old Caucasian female presented with complaints of headaches, eyestrain, blur, intermittent vertical diplopia, poor balance and coordination, and glare problems at night. She also reported reading difficulties, including skipping words, re-reading, words moving on the page, and decreased comprehension. Her symptoms significantly interfered with her ability to perform work-related tasks and activities of daily living. She had a complicated medical history including multiple concussions, presumed viral meningitis, and degenerative disc disease. Examination revealed binocular dysfunction, accommodative dysfunction, visual-vestibular dysfunction, and anterior visual midline shift. These findings are consistent with post-trauma vision syndrome (PTVS). She responded well to base-down yoked prism, microprism BI, low plus lenses, and anti-reflective coating. At follow-up she reported a decrease in headaches, diplopia and words moving on the page.

BACKGROUND

- 1.7 Millions Cases of Traumatic Brain Injury (TBI) reported per year.
- A Concussion is a type of Traumatic Brain Injury caused by a bump, blow, or jolt to the head that can change the way your brain normally works.
- 75% of Traumatic Brain Injuries are considered to be Concussion or other Mild TBI.
- Common symptoms include: Reading problems, Blur, Eyestrain, Headaches, Diplopia, Light sensitivity, Dizziness, Nausea, Vertigo, Motion sickness, Balance/coordination problems
- 90% of TBI patients suffer from visual dysfunctions such as: Myopic shift, Accommodative dysfunction, Binocular dysfunction (esp. Convergence insufficiency and Exotropia), Oculomotor dysfunction, Visual-perceptual dysfunction, Visual-motor dysfunction, Visual-midline shift, Visual field defects, Unilateral spatial inattention, Visual-vestibular dysfunctions (dizziness)
- Treatment options include: Optometric vision therapy, Low plus lenses (for non-presbyopes), Base-in prism lenses, Binasal occlusions, Sector occlusions, Yoked prism lenses, Tinted lenses, Syntonics, Primitive reflex integration

CASE SUMMARY

History:

- 39 y.o. Caucasian Female
- Program Specialist for pediatric development center
- Med. Hx: presumed viral meningitis, degenerative disc disease, spinal surgery followed by physical therapy.
- Multiple Concussions:
 - o Hit in the back of the head by a child client at work, vomited afterwards, 1.5yrs ago
 - o 3 Falls in the last two months

Symptoms:

- Reading Difficulties: skipping words, re-reading, words moving on the page, decreased comprehension.
- Headaches
- Eyestrain
- Blur
- Intermittent vertical diplopia
- Glare problems at night
- Poor balance and coordination
- Difficulty crossing the street

Diagnosis:

- Post-Trauma Vision Syndrome (PTVS)
 - o Accommodative dysfunction
 - o Binocular dysfunction
 - o Anterior visual midline shift
 - o Visual-vestibular dysfunction

Initial Treatment:

- Distance SV
 - o OD: PL -0.75 x175, 1^ΔBU, 0.5^ΔBI
 - o OS: -0.25 -0.25 x175, 1^ΔBU, 0.5^ΔBI
 - o Anti-reflective coating
- Near/Intermediate SV
 - o OD:+0.25 -0.75 x175, 1^ΔBD, 1^ΔBI
 - o OS: PL -0.25 x175, 1^ΔBD, 1^ΔBI
 - o Anti-reflective coating
- Reports sent to neurologist and primary care optometrist

Follow-Up #1: (3 weeks after initial evaluation)

- Dilated Fundus Evaluation: unremarkable OU
- Decrease in headaches and diplopia. Increased balance overall.

Follow-Up #2: (1 month after last follow-up)

- Decrease in headaches, diplopia and words moving on the page.
- Eyestrain still persists.
- Neuro-Optometric Testing:
 - o Anterior Visual Midline Shift
 - o Trail Frame now preferred 1^Δ Yoked BD instead of 1^Δ Yoked BU: improved balance when walking and on Airex foam board, improved visual comfort at Far.
- Changed Distance SV
 - o OD: PL -0.75 x175, 1^ΔBD, 0.5^ΔBI
 - o OS: -0.25 -0.25 x175, 1^ΔBD, 0.5^ΔBI
 - o Anti-reflective coating
- Collaborated with her neuro-psychologist to request insurance authorization for further office-based, medically necessary, optometric vision therapy.

CONCLUSION

- Careful evaluation of patients with concussions using neuro-optometric tools can be an initial step to improve daily function and the rehabilitation process.
- Patients with concussions often respond positively to small quantities of prism and lens power.

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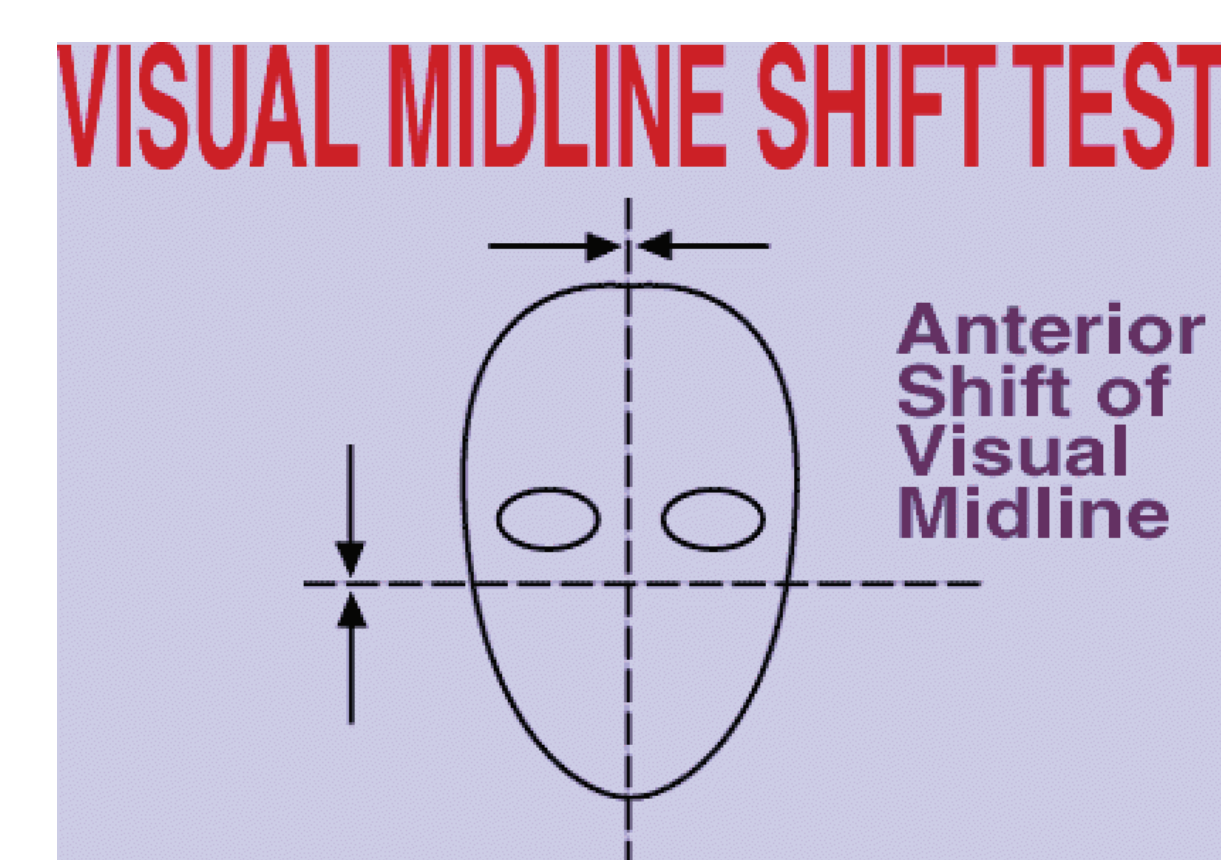


Fig 1: Anterior Visual Midline Shift. (http://padulainstitute.com/?page_id=201)

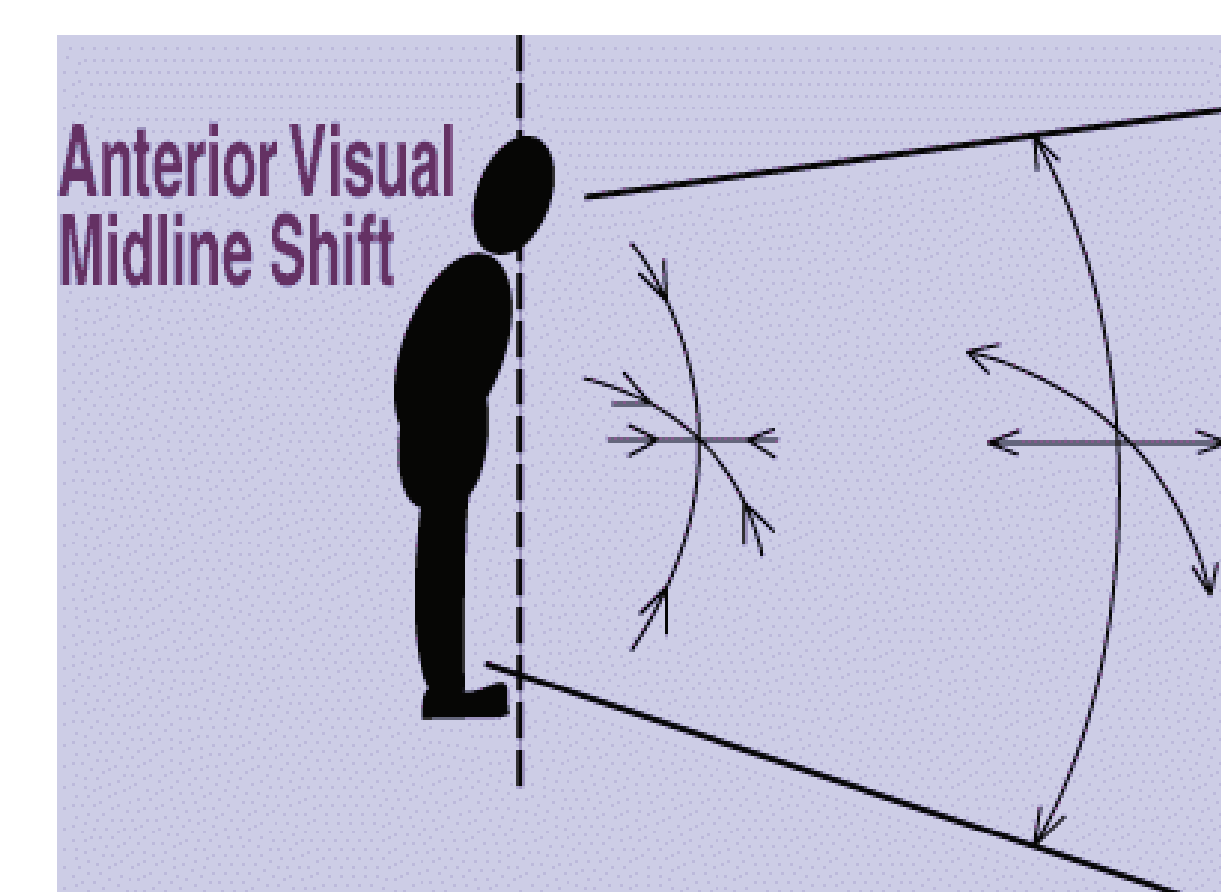


Fig 2: Anterior Visual Midline Shift Affecting Posture. (http://padulainstitute.com/?page_id=201)

Table 1: Initial Clinical Findings		
Acuities	Hab SRx Distance	Hab SRx Near
OD	20/20-1	20/20
OS	20/25	20/20
Cover Test		
Distance	Ortho	
Near	2 Δ XP	
Dynamic	small EP	
Confrontation Visual Field	Full OD, OS	
Refraction		
OD	PL -0.75 x175	20/20-2
OS	-0.25 -0.25 x170	20/20-2
Binocular Testing		
NPC	TTN (1°, 7/12 cm5°)	
Base Out (F)	4/6/2	
Base In (F)	x/6/2	
Base Out (N)	10/14/0	
Base In (N)	12/16/8	
NRA	+1.75	
PRA	-0.75	
Accomm. Amp. OD	5D	
Accomm. Amp. OS	5D	
Accomm. Amp. OU	6D	
Neuro-Optometric Testing		
Visual Midline Shift	Subtle Anterior Visual Midline Shift better at F	
0.5° Base In prisms OU	better at N	
1.0° Base In prisms OU	clearer and bigger at F and N	
1.0° Base Down prisms	+0.25 DS Add better at N	
Low Plus lenses	no difference	
Binasal	no improvement	
Tint		
Visual-Vestibular Evaluation		
Dynamic VA	20/20 but "feels woozy"	
Airex Foam Board:		
Eyes Open (on ground)	okay	
Eyes Closed (on Ground)	difficult	
Eyes Open (on foam)	difficult	
Eyes Closed (on foam)	very difficult	
Eyes Open (on foam) w/ 2Δ yoked Base Up	increased balance	
Gait and Balance Evaluation w/ 2Δ yoked Base Up	increased balance	
Ocular Health	unremarkable OU	



Fig 3: Visual Vestibular Testing on Airex Foam Board



Fig 4: Gait and Balance Evaluation with Yoked Prism