Optometric Issues in the Treatment of the Concussed MLB Player

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CONGRATULATIONS
EAGLES!

SUPER BOWL
LII CHAMPS
#FLYEAGLESFLY
With help of many, Tommy Joseph's MLB dream came into focus

By Jim Salisbury | NBC Sports Philadelphia
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Optometric Affectation

• Disturbances to the visual system secondary to concussion is known as Post Trauma Vision Syndrome

• Common disturbances with PTVS:
  Tear Film Integrity
    Distorted clarity or gritty sensation varies with blinking
  Light Dark Adaptation
  Light Sensitivity
Optometric Affectation

• Common disturbances with PTVS:
  Visual Field Integrity
  Loss of portion of visual field
  Accommodation
  Constant or transient blur
Optometric Conditions

• Optometric Issues
  – Convergence Insufficiency
    • Important for reading
    • Inability to use two eyes together as a team
  – Oculomotor Dysfunction
    • Permits accurate visual scanning and exploration
    • Important for reading and copying from board
    • Inability for eyes to together track a moving target and switch fixation from one target to another
Optometric Conditions

• Optometric Issues
  – Accommodative Infacility
    • Important for academic efficiency and comfort to focus on an object – i.e. copy from blackboard
    • Inability to allow rapid and accurate shifts of attention from one distance to another with instantaneous clarity
    • Inability to allow student to maintain focus at reading distance
Optometric Conditions

- Optometric Issues
  - Visual Intake-Visual Memory
    - Allows for optimal academic and athletic performance as affects proficiency in reading comprehension and spelling
    - Inability to obtain maximum visual information in the shortest possible time
    - Inability to retain this information over an adequate period of time
Optometric Conditions

• Optometric Issues
  – Visual Motor Integration Deficit
    • Inability to analyze a visual stimulus, integrate that information with other systems, and produce a motor response (inappropriate eye-hand coordination)
    • Needed to produce written language
  – Fusional Instability
    • Inappropriate binocular function
    • Needed for near and distant visual tasks
    • Cause of blur or double vision
UPMC Symptom Categorization

• Ocular
  – Ability of optometric system to work appropriately
  – Are vergence and divergence, smooth pursuits, saccades, accommodation, convergence, VOR and VOR cancellation appropriate

2. Saccades Testing
   - Point to Point Discrimination in horizontal and vertical planes (Fingers 12 inches apart and patient looks between them for 15 seconds.)
   - Look for latency of onset, speed, accuracy and conjugate movement. Test failure is delayed, inaccurate saccades or disconjugate eye movement.
VOMS Physician Examination

3. Vestibulo-Ocular Reflex (VOR) – Gaze Stability

- Ability to focus on stationary object while moving head without blurriness or dizziness

- Do with examiner finger stationary and patient moving head side to side while fixating on stationary finger

- Test in horizontal and vertical plane for 15 seconds

- Look for inability to hold focus

- With provocation, see decline in visual motor speed and reaction time
4. Visual Motion Sensitivity (VOR Cancellation)

- Response to optokinetic stimulation
- Patient focus on thumb as moves side to side following own thumb
- Look for inability to follow fixated object
- With provocation, see decline in visual motor speed and reaction time
VOMS Physician Examination

5. Near Point Convergence Dysfunction Test
   – Focus on writing on pen 6 cm from nose bridge
   Look for diplopia at greater than 6 cm

6. Test of Near Point Accommodation
   - Cover one eye
   - Bring object to face
   - Should accommodate – see clear at 15 cm
   - Can fatigue system by bringing closer

Consider use of King Devick Test
Ocular Symptomatology

– 42 to 69 % of patients report this (CAN BE PRE-EXISTING)

– Frontal headache, tired behind eyes

– Problems in math and science

– End of day fatigue

– See issues with near point convergence, accommodation, pursuits, saccades on VOMS

– See decrease in verbal memory, visual motor speed composite and reaction time on computer neuropsychological testing

– Problem is in encoding not retrieval
Ocular Symptomatology

• Ocular
  – Treatment
    • Vestibular Therapy
    • Vision Therapy – may have to do visual therapy before vestibular if extremely symptomatic
      – Can be done in office or at home
      – May involve spectacle use and/or computers
    • Exertion Therapy
    • ? Treatment for stress/anxiety
Visual Treatment

• Treatment Modalities
  – Anti-refractive coating and corrective lenses
  – Correcting prism
    • High convergence excess
    • Vertical deviations
    • Fixation disparities
    • Selective Occlusions
Visual Treatment

• Treatment Modalities
  – Yoked Prism
    • Visual Midline Shift Syndrome
    • Progressive Supra Nuclear Palsy
    • Visual Field Defects
    • Certain Visual Perceptual Processing Defects
    • Ocular Motion Restriction
Visual Treatment

• Treatment Modalities
  – True Optometric Rehabilitation
    • Improve convergence and eye teaming abilities
    • Improve accommodative ability
    • Improve visual tracking skills
    • Improve short term visual memory
    • Done via intra office exercises using charting, tracking and computers and can also be then transferred to home computer
Thank You

The Underdog