Concussions represent a major health concern as they result in a temporary disruption of brain function, often described as form of traumatic brain injury (TBI).1

Concussions occur due to the biomechanical forces introduced into the body or head, resulting in acceleration, deceleration, and rotational forces of the head.1

Approximately 3.8 million concussions occur in the United States each year due to sport and recreation, with up to 50% not being reported.2

Sports related concussions are typically self-limiting, with patients presenting with alterations in neurocognitive and neurological functioning that resolve within 7-10 days with appropriate return-to-play management.2

Post-concussion syndrome (PCS) includes various physical, cognitive, behavioral, and emotional symptoms occurring after a TBI. These symptoms include headaches, fatigue, changes in vision, problems with balance, confusion, dizziness, insomnia, neuropsychiatric symptoms, and trouble with concentration.3

Persistent post-concussion syndrome (PPCS) occurs when symptoms persist greater than 3 months.3 Inadequate management of PPCS can lead to adverse outcomes, emphasizing the need for early and effective interventions implemented through a multidisciplinary approach.

The goal of this case report is to familiarize providers with the evaluation, resources, and follow-up necessary to ensure patients can return-to-play in a safe and effective manner after a concussion with prolonged symptomatology.

Case History

The patient in this case is a 14-year-old male who presented for evaluation for concussion without loss of consciousness.

He was hit in the back of the head while playing basketball in late July 2023.

Two weeks after the incident, he developed headache, dizziness, and trouble falling asleep. He also endorsed multiple falls.

He was seen for initial evaluation in clinic on 9/7/2023 following head injury. Physical exam at that time remarkable for discomfort with horizontal saccades. Referred placed for physical therapy for vestibular therapy and speech cognition evaluation for assessment of patient's memory.

At follow-up on 9/19/2023, patient reported feeling 70% better. He was unable to look ahead while walking and maintain gaze with guilt. Mild syncopeal-like episode noted after aerobic testing. Patient's symptoms were consistent with persistent post-concussion syndrome with underlying dysautonomia.

It was recommended that at that time patient participate in a home exercise program utilizing weekly physical therapy for 4 weeks. Therapeutic exercise/interventions performed during that encounter included pencil pushups, vestibular ocular reflex therapy, high intensity interval training, and target following with basketball.

He was seen for follow-up with physical therapy on 11/16/2023; exam at that time demonstrated mild loss of target with recovery with smooth pursuits and positive horizontal vestibular-okular reflex testing with quick recovery.

At this follow-up, the patient was evaluated by the NASA 10-minute lean test, which involves measuring the blood pressure and heart rate while resting supine and then every minute for a total of 10 minutes while standing. This test evaluates orthostatic intolerance, with reported symptoms being recorded during the test.4

During NASA 10-minute lean test, the patient remained asymptomatic.

Patient did well with his second session of physical therapy; improvement was noted in all VOMS testing. Neuromuscular re-education and therapeutic exercises were utilized to stimulate athletic play with patient not presenting with any symptoms of hypovention. Patient was deemed to be stable to continue home exercise plan to include VOR with walking and progressions.

He no longer required physical therapy.

On follow-up in clinic on 11/16/2023, patient was given permission to resume his return-to-play protocol with noncontact practice, with gradual return to contact practice before being fully cleared. Athletic trainer was notified of plan.

Discussion

Concussions are a common medical concern encountered in daily clinical practice.

Studies have demonstrated that effectively addressing persistent post-concussive symptoms necessitates a collaborative approach involving primary care physicians, physical therapists, speech-language pathologists, psychologists, and athletic trainers.5 By working together, they can ensure a timely diagnosis and personalized treatment plans, while providing support to patients and families.

This case shows how while the patient initially showed improvement, his athletic trainer noted increased symptoms during the return-to-play protocol assessment. Through re-evaluation and physical therapy, the patient’s symptoms improved and facilitated his return to sports.

Interdisciplinary collaboration is key in enhancing patient outcomes and mitigating the long-term impact of concussions.6-7

Rehabilitation

The patient was evaluated by physical therapy on 11/7/2023; VOMS was positive with vertical smooth pursuit and horizontal/vertical vestibular-ocular reflex.

During the Buffalo concussion treadmill test, a significant amount of diaphoresis noted at four minutes. He was unable to look ahead while walking and maintain gaze with guilt. Mild syncopeal-like episode noted after aerobic testing.

Patient’s symptoms were consistent with persistent post-concussion syndrome with underlying dysautonomia.


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References


https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1895285/

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