Deep Impact: Evaluating Concussion and its After Effects

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Objectives

- Perform initial in-office evaluation
- Know when to refer
- Implement general return to play program
- Understand potential long-term consequences
Epidemiology

- 3.8 million sports concussions annually in US
- 2.5 concussions per 10,000 athletic exposures in high school students
- American football has highest number followed by girls soccer
- M:F ratio of 2-2.8:1
Clinical case

- 18 yo female high school soccer player. She collided heads with another player during a game at a tournament over the weekend and was removed from the game due to concern for concussion. There was no LOC
- Comes to your office for evaluation 2 days after the initial injury
- PMH: depression/anxiety (sees a therapist)
- Current sx: headache, difficulty sleeping and concentrating, fatigue, photophobia
Which is true of concussions?

- A. LOC is common
- B. Requires a direct blow to the head
- C. Requires neuroimaging for diagnosis
- D. Is diagnosed clinically
Definition

- Complex pathophysiological process affecting the brain induced by biomechanical forces.

- Common features include:
  - Direct blow to head, face, neck or elsewhere w/impulsive force transmitted to head
  - Rapid onset of impairment in neurological fxning that resolves spontaneously
  - Functional rather than structural injury
  - May or may not involve LOC
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“Concussions are like snowflakes…”

- Accurate/focused hx
- Pertinent physical exam
  - Mental status
  - Focused neuro exam
  - MSK
  - Ocular
  - Balance
Clinical Tools
SCAT 3

- Background hx
- Symptom score
- Cognitive exam
- Neck exam
- Balance exam
- Coordination
- Delayed recall
Acute Concussion Evaluation Form

- Injury characteristics
- Symptom checklist
- Risk factors for protracted recovery
- Red flags
- Diagnosis
- Follow up action plan
At Risk Populations

- Hx of > 3 concussions
- Women, children
- Hx of mood or learning disorders
- Hx of migraine
- Family hx (migraine, mood, learning d/o)
- ApoE4 gene?
Clinical Case

- Remains symptomatic 2 days after initial dx
- ACE evaluation completed
- Hx of mood d/o
- Current high school student
- What should we recommend for:
  - Current management
  - Return to learn
  - Return to play
Which is true regarding prevention and management of concussions?

- A. Medication can hasten recovery
- B. Helmets can prevent concussions
- C. Most concussions resolve in 7 – 10 days
- D. Increased cognitive activity helps in recovery
Management

- 80 – 90% of concussions resolve in 7-10 days
- Cornerstone of rx is physical and cognitive rest
- Tailor management to each individual
- Serial evaluation and management
- Medications and supplements are not helpful
Prescribed Rest??

- Journal of Pediatrics – November 2012
- Small study of 49 high school students referred to a sports concussion center
- Prescribed 1 week of complete rest
- Participants had significantly improved performance on cognitive assessment and decreased symptoms following rest
- Limitations
Too much rest??

- Recent study in Pediatrics – Feb 2015
- 2 groups \(\rightarrow\) 5 days of strict rest at home vs usual care (gradual return to activity)
- Rest group \(\rightarrow\) slower resolution of sx and higher sx burden in the first 10 days
- No significant difference in balance scores, neuropsych testing, or neurocognitive assessments
Return to Learn

- 24 – 48 hours of complete rest
- Includes activities such as reading, video games, screen time, social interactions
- Return to school → when able to concentrate 30 – 45 minutes without symptoms
- May need accommodations
- Anticipatory guidance to avoid activities that worsen symptoms
Return to Play

- Graduated protocol → **no same day RTP!**
- Criteria to start protocol
- Each step should take minimum 24 hours
- Drop down a step if any sx occur and wait 24 hours before attempting next step again
Return to Play

1. Light aerobic exercise
2. Sport-specific exercise
3. Non-contact training drills
4. Full-contact practice
5. Return to play
When to Refer

- Anything outside expected normal course of recovery
  - Worsening of sx
  - Medical or psychiatric complications
- Prolonged recovery (>3 – 4 weeks)
- Concern for post-concussion syndrome
- Physician discomfort
Long-term Consequences

- Post-concussion syndrome
  - Symptom complex that includes headache, dizziness, neuropsychiatric symptoms, and cognitive impairment
  - Consider if sx remain > 3 weeks after injury
Long Term Consequences

- Chronic traumatic encephalopathy
- Neuropsychological deficits following multiple concussions
- Diagnosed on autopsy
- NFL players, boxers
Are Helmets Helpful?

- No consistent evidence that they prevent concussion
- Sport specific
- Risk compensation
- Can prevent skull fractures
- Consider rule changes
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Key Points

- Concussion remains a clinical diagnosis
- Clinical assessment tools – SCAT3, ACE form
- Develop individualized rx plan with gradual RTL/RTP
- There are limitations to protective equipment for concussions
Resources

• Providers
  • SCAT3/Child SCAT3
  • ACE form – cdc.gov
  • AAFP webinars – aafp.org/concussion-awareness
  • Consensus statement on concussion in sport

• Parents
  • ACE care plan
  • AAFP pt education brochure (Sports Related Concussions in Youth)
References


References


