Case Study: PIP joint injury

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Outline

• Anatomy
• Mechanism of Injuries
• Treatment Protocols
• Case Study- “Jack”
• Possible Complications
• Discussion
• Summary
Anatomy - PIP joint

PP- Proximal Phalanx  
MP- Metacarpal Phalanx  
ECS- Extensor Central Slip  
PCL- Proper Collateral Ligament

FT- Flexor Tendon  
ACL- Accessory Collateral Ligament  
VP- Volar Plate
Anatomy - PIP joint
Volar plate injury

- Forced Hyperextension
- Axial Loading
- Swan Neck Deformity
Central slip injury

Forced Hyper-flexion

Boutonniere’s Deformity
Treatment Protocols

Primary Goal
To restore joint stability, manage pain, swelling and maintain functional range of movement.
Volar Avulsion Rx

Progressive extension splint with protected active motion:
- Week 1: 30 degrees
- Week 2: 20 degrees
- Week 3: 10 degrees
- Week 4: Full extension
- Buddy strapping for two weeks

(Leggit & Meko, 2006)
Dorsal Avulsion Rx

1. Large Fragment (>30 %)
   - Open reduction and fixation followed by early active motion
   - Splint PIP joint in extension for 3-6 weeks (Leggit & Meko, 2006)

2. Insignificant Fragment or none
   - Splint PIP joint in extension for 6 weeks
   - Followed by buddy tape for 2 weeks (Frieberg et al, 2006)
“Jack”
“Jack”

**Person**
- 18 years old
- Football injury
- “… avulsion fractures to the volar and dorsal lips of the left ring finger base of the middle phalanx”
- “Marked surrounding soft tissue thickening”
- Motivated to return to football ASAP
- Non-dominant hand

**Environment**
- Referred by GP
- Presented 2 days post injury date
- Exam period
- Football season
- Weekly sessions

**Occupation**
- Engineer student
- Plays football twice weekly

**Occupational Goal:**
To return to playing football for the rest of the season.
“Jack”
Initial Assessment

✓ Pain
✓ Oedema
✓ AROM
Possible complications to consider

- Pain
- Reduced AROM
- Ongoing swelling
- Stiffness
- Instability
- Fixed flexion deformity
- Premature degenerative arthritis
- Swan necking
- Boutonniere's Deformity
How would you splint Jack?
Jack’s Rehabilitation
Initial Assessment

Problems
• Joint instability
• Pain
• Moderate/ severe swelling

Goals
• Protect PIP joint, manage pain and reduce swelling

Solutions
• Finger dorsal blocking splint with PIP joint in 15 degrees flexion, DIPJ 0 degrees
• Lycra finger stall
• No exercises
Week 2

Problems
• Pain
• Mild swelling
• DIP joint stiffness

Goals
• Protect PIP joint, manage pain, reduce swelling, reduce stiffness of DIP joint

Solutions
• Continue with finger dorsal blocking splint with PIP joint in 15 degrees flexion, DIPJ 0 degrees
• Continue with lycra finger stall
• DIP joint blocking exercises
Week 3

Problems
• Pain
• Stiff PIP and DIP joints

Goals
• Protect PIP joint, manage pain and stiffness of the DIP and PIP joints

Solutions
• Finger volar blocking splint with PIP joint in 10 degrees flexion, DIPJ 0 degrees
• Continue with DIP joint blocking exercises, gentle passive PIP joint exercises
Week 4

Problems

• Increased pain
• Stiff PIP and DIP joints

Goals

• Protect PIP joint, manage pain and maintain AROM

Solutions

• Finger barrel splint, with PIP joint in 0 degrees and DIP joint free
• Active extension and flexion of DIP joint
• Stopped passive PIP joint exercises
Week 5

Problems
• Pain
• Stiff PIP joint

Goals
• Protect PIP joint, manage pain and maintain AROM

Solutions
• Lycra buddy socks
Week 6

**Problems**

- Avulsion fractures still healing
- Achy pain

**Goals**

- Protect PIP joint, manage pain and maintain AROM
- Return to football

**Solutions**

- Full finger barrel splint for football
- Continue with lycra buddy stall
Week 8

Problems
• Mild discomfort
• Reduced strength

Goals
• Protect PIP joint, manage pain and grip strength

Solutions
• Gentle strengthening program
Week 10

AROM:
Week 12

- Stable joint
- Reduced swelling
- Full AROM
- Reduced pain
- Good strength
Week 12

ACHIEVED FOOTBALL GOAL!!!
Summary

• PIP joint injuries can be complex
• Possible complications
• Clinical Reasoning
• Holistic approach


Reference List


Any Questions or Comments?