In Office Treatment of Common Pediatric Shoulder Injuries

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Main Objective

• Make you Comfortable with Diagnosing and Treating Common Shoulder Injuries/Problems
Objectives

1) Epidemiology of shoulder injuries
2) Pertinent anatomy/terms
3) Physical examination
4) Radiographic evaluation
5) Review of common injuries

THE TOP TEN
Epidemiology

Nordqvist & Petersson, JSES,

• Prospective study of all shoulder injuries in one year in Malmo, Sweden

• 248 elderly

• 181 adult
  – 67 clavicle fractures
  – 60 proximal humeral fractures
  – 31 shoulder dislocations

• 75 children
  – 65 clavicle fractures
  – 37 sports related
Epidemiology

Increasing incidence of shoulder injuries in children and adolescents

• Increased sports participation
  – Younger age
  – Increased time/intensity
  – Higher level of competition
  – Return to play considerations

• Rising popularity of “extreme” sports

• Increased awareness
ORTHOPAEDIC TERMINOLOGY

- Tendon—connects muscle to bone
- Ligament—connects bone to bone
- Joint—articulation of two bones
- Sprain or Tear—Ligament, Tendon
- Strain—Muscle
- Fracture=Break=Crack=Chip—Bone
Fracture=Break=Crack=Broken

Pearl
Fracture Terminology

- Location—Which bone and where
- Displacement – non displaced
- Angulation – Angle at the fracture site
- Comminution -- How many pieces
TERMINOLOGY

- **Epiphysis**
- **Epiphyseal plate (growth plate)**
- **Diaphysis**
- **Metaphysis**

- Fusion occurs at specific age for different bones.
- It occurs 1-2 years earlier in females than in males.
Salter-Harris Classification

- Normal
- Type 1 - 5%
- Type 2 - 75%
- Type 3 - 10%
- Type 4 - 10%
- Type 5 - uncommon
Anatomy

Bony anatomy
• Proximal humerus
• Scapula
• Clavicle
• Sternum
• Thoracic ribs

Joints
• Glenohumeral joint
• Acromioclavicular joint
• Sternoclavicular joint
ANATOMY

Front View of Shoulder

- Acromion
- Bursa
- Supraspinatus muscle
- Rotator cuff tendons
- Humerus (arm bone)
- Biceps tendon
- Coracoacromial ligament
- Subscapularis muscle

The muscles and tendons of the rotator cuff surround the shoulder joint.
Physical Examination
ASSESSMENT
Inspection

Look for
Asymmetry
Asymmetry
ASSESSMENT
Where does it hurt?

• Palpate the structures
  – Anterior
    • AC joint, Clavicle, SC joint, Humerus
  – Posterior
    • Scapula
    • Ribs
Physical Exam
Palpation

A-C JOINT

S-C JOINT
Physical Examination

“Orthopaedic injuries hurt”

Observation
- Deformity
- Swelling
- Ecchymosis
- Wounds, skin compromise

ROM
- 3 Planes
- Glenohumeral vs. scapulothoracic

Neurovascular evaluation
- Axillary nerve
- Subclavian/brachial artery
XRAY/MRI

• When to order an Xray?  ALWAYS

• When to order an MRI?  Depends
Radiographic Evaluation

Shoulder

- AP
- Lateral (Y)
- Axillary
XRAY REQUEST

- AP / Lateral and Axillary views of Right Shoulder and/or
- AP view Right Clavicle
- Pearl
MRI or CT Scan

Sternoclavicular joint
• CXR

CT scan
SHOULDER INJURIES IN ADULTS ARE DIFFERENT
Shoulder Problems in Children

• Same mechanism of injury

• Different “weakest link”

• Different treatment
Things you will NOT see in Children

- Rotator Cuff Tears
- Biceps Tendon Ruptures
- Calcific tendonitis
- Adhesive Capsulitis (frozen shoulder)
- Osteoarthritis

- pearl
Biceps Rupture
Stiff Shoulder
TOP TEN

TRAUMATIC
• Shoulder Contusion
• Fracture of the Clavicle
• Fracture of the Humerus
• AC Separation—(SC)
• Shoulder Dislocation/Subluxation

NON TRAUMATIC
• Little League Shoulder
• Infection/ Bone Cysts
• Neck Pain
• Overuse instability
• Impingement
Traumatic
Contusions (common)

- Direct trauma to lateral humerus
- Shoulder tender
- Difficult to Diagnosis in child -
- May lead to myositis ossificans or HO
- Goal: protect, maintain ROM, sling for comfort, ice
Fracture of the Clavicle
Clavicle Fractures

Presentation

• Fall onto lateral aspect of shoulder
• Pain, deformity
• 10-15% of all Pedi fx
• 80% mid shaft
• Rare neurovascular compromise, PTX

Radiographs

• CXR
• AP shoulder
Clavicle Fractures

Excellent healing potential

Treatment
- Symptomatic
- Reduction not performed
- Sling vs. Figure-8 brace
- Pain free within 4-6 weeks
Clavicle Fractures

Surgical indications

- Open fractures
- Associated fractures of the shoulder
- Vascular compromise
- Skin tenting or impending open fracture
- Failure to heal
Clavicle Fracture
Why is it so common?

Only bone that connects the arm to the body.

A long tubular bone

The “WEAKEST LINK” in the chain in a child.
Humeral Fractures

• **Shaft**
  - Transverse, treat in sling or brace, 10-12 weeks to complete healing

• **Proximal**
  - Will involve the Growth Plate as the “weakest link” of proximal humerus.
    - Initial treatment-- Sling, Ice. Ortho
Humeral Fractures

- Shaft – Splint, sling, may take several weeks to months, possible nerve injury
Proximal Humerus Growth Plate Fracture
Shoulder Dislocation
Shoulder Dislocation
Acute Dislocations

• DIAGNOSIS---Obvious Deformity, flat deltoid, squaring off of shoulder, humeral head in axilla.

• OFFICE TREATMENT – Referral to ER for immediate reduction. X-ray. Sling, Ice, Ortho
Acute Subluxations/Dislocations
A Spectrum

Subluxation – brief, transient translocation or shift, undocumented, spontaneously reduces.

Dislocation – Complete dissociation, documented, requiring a reduction

Complications are Uncommon,

Recurrence rate is high – approaches 90%
Shoulder instability

• Physical Therapy

• Surgical Repair for Recurrence
AC Separation

3rd degree shoulder separation (AC)
Acromioclavicular (AC Joint) Separation
AC joint sprain

- “Shoulder separation”
- Fall on lateral shoulder
- Tender over AC joint
- May be prominent (Types I-VI)
- Treatment—Xray, Sling, Ice. Ortho
GH Dislocation   AC Separation

Yes recurrence   No recurrence
Dislocation vs. AC Separation Pearl

Yes recurrence

No recurrence.
Sternoclavicular (SC) Separation

Uncommon- Usually growth plate injury

Cause-- blunt trauma (falling, colliding)

• Anterior displacement more common than posterior.
• Sling, Ice, Ortho
Posterior SCJ Injuries

Diagnosis often missed
Acute, chronic complications
  – Mediastinal compression

Accurate diagnosis and prompt treatment essential for good functional outcome
Refer to ER, Ortho, Sling
Non- Traumatic

Insidious Onset
Little League Shoulder
Proximal Humerus Epiphysitis
Little League Shoulder has an Open Growth Plate
Little League Shoulder

• Vague shoulder pain
• “Dead arm” or “Tired”
• Loss of velocity and accuracy
Little League Shoulder

- Limit pitching
- Physical Therapy
- Strengthen Rotator Cuff, Stretch.
Osteomyelitis

X-ray

MRI
Osteomyelitis

History can be confusing
Constitutional symptoms
Painful are of motion and tender to touch
Labs/Xray/ MRI/ Consult
Unicameral Bone Cyst
Fracture of UBC
Cervical Strain
Cervical Strain

“Shoulder Pain”

Soft Cervical Collar
SHOULDER PAIN vs. NECK PAIN

• Can be a difficult differential.
• Start with ROM of the neck.
• Majority of the pain medial (neck) or lateral (shoulder) to the A-C joint.
• PEARL: Pain worse (shoulder) or better (neck) with hand over the head.
Shoulder Instability

- Atraumatic
  - Swimmers
  - Gymnasts

- Pain, “dead arm”
- Decreased performance
- Global instability
- Rehab, rehab, rehab
Instability

-Most common source of pain in the young Skeletally Mature throwing athlete

-Etiology: instability of humeral head in the glenoid fossa

-Micro-instability which results from repetitive abduction external rotation

-Stretching of anterior capsular

-Swimmers, throwers, tennis players
Physical Exam
Anterior Instability

Anterior Apprehension vs. Relocation

- Apprehension
Shoulder Impingement

- Is NOT seen in the young pediatric patient
- And RARELY in under 21 y/old
PEARL: Shoulder "Impingement" is INSTABILITY
WHAT IS IMPINGEMENT?
How do we treat Impingement?

- Shoulder Exercise Program
  - Home exercise program
  - Physical therapy program

Anti-inflammatory medication
- NSAIDS
- Cortisone injection
PHYSICAL THERAPY
PHYSICAL THERAPY FOR Imping, LLS, DisI, Instability

Prescription:

Range of Motion

- Rotator Cuff Strengthening below horizontal plane
- Strengthening Scapular Stabilizers
- Low weights/ high reps
- Pearl
INJECTION “COCKTAIL”

• 1cc-2cc of steroid

• 4cc-9cc of lidocaine without epi.
ANGLE OF APPROACH

• NO

• YES
INJECTION
THANK YOU