AC and SC Joint Injuries
2020 Update

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Disclosure

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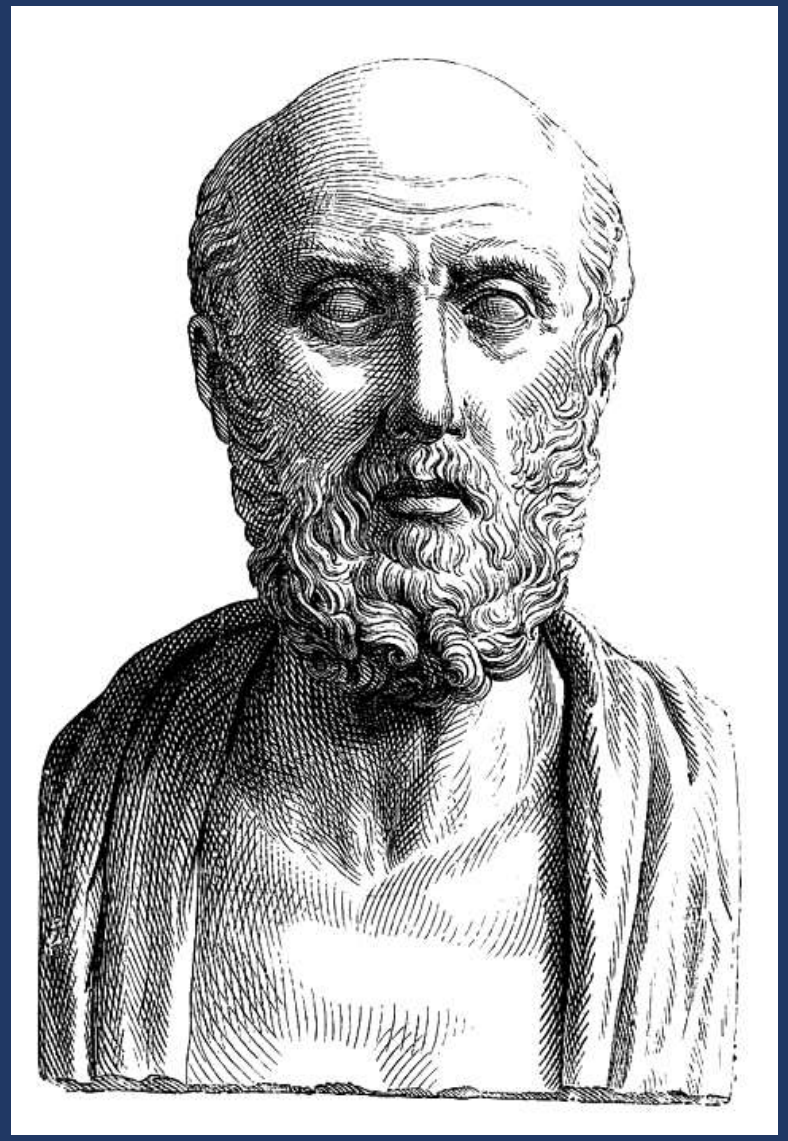
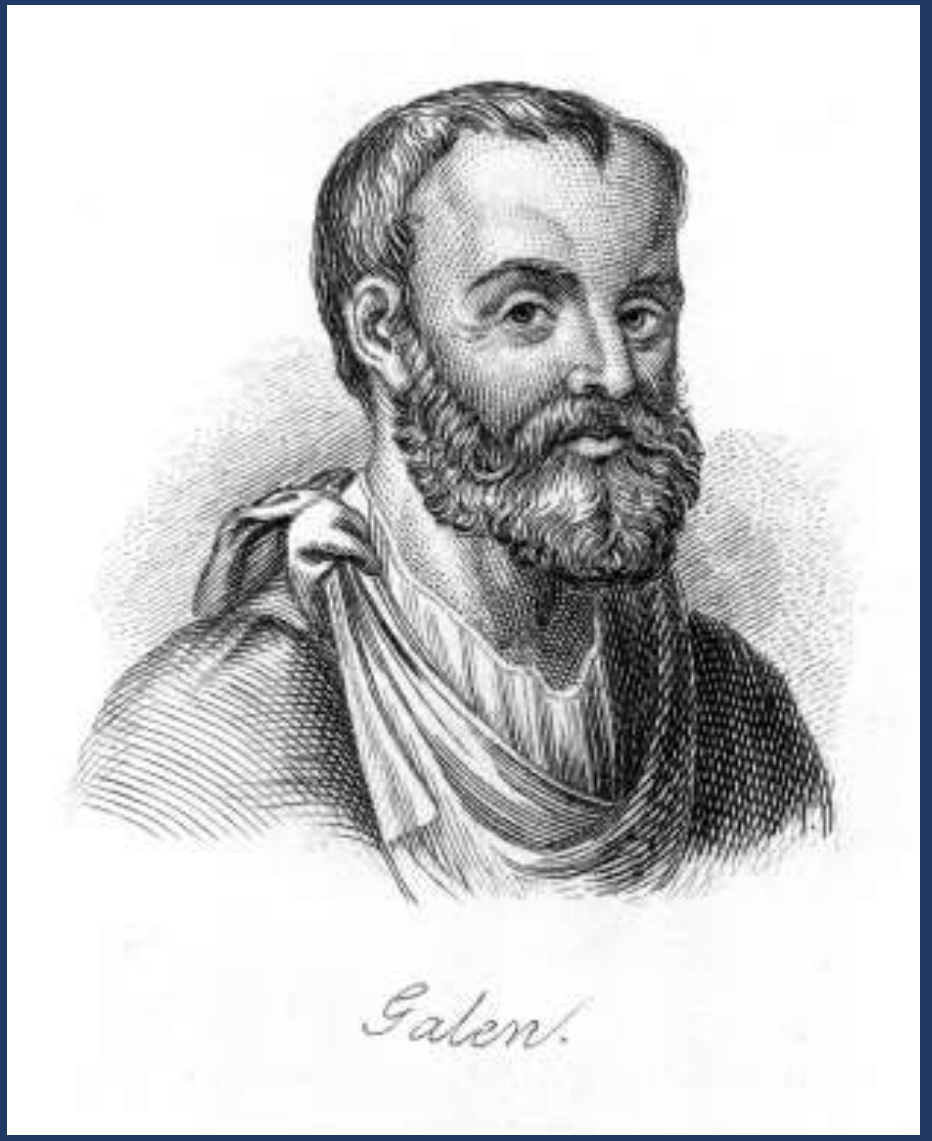
Objectives

- Anatomy
- Mechanism of injury
- Treatment options
- Outcomes
- Complications

AC JOINT INJURIES



Hippocrates (460-377 BC)



Galen (129-199 AD)

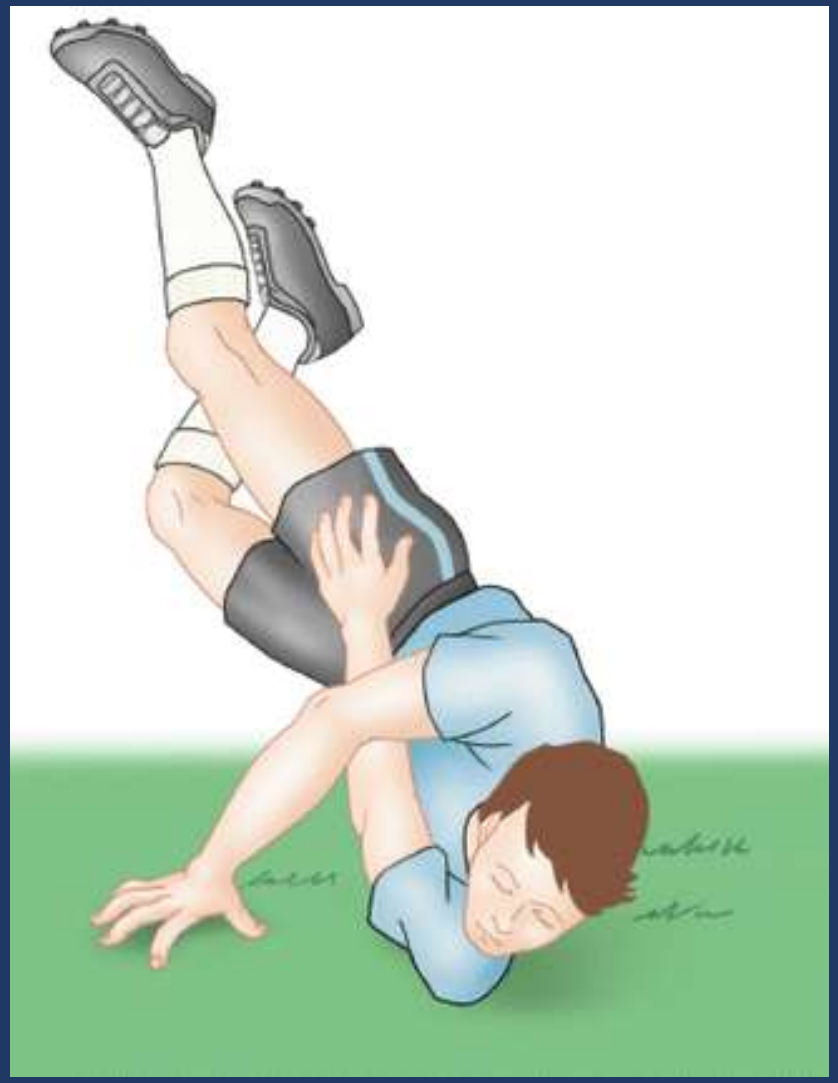
Epidemiology

- 1.5-2 per 10,000 inhabitants
- Roughly 9% of shoulder girdle injuries cause damage to the AC joint
- 40-50% of shoulder injuries in contact sports
- 5X more frequent in men than women
- Most common age is 20-30 years old

Mazzocca et al. Am J Sports Med 2007;35:316-329.

Andreani et al. Eur J Orthop Surg Traumatol 2014;24:237-242.

Mechanism



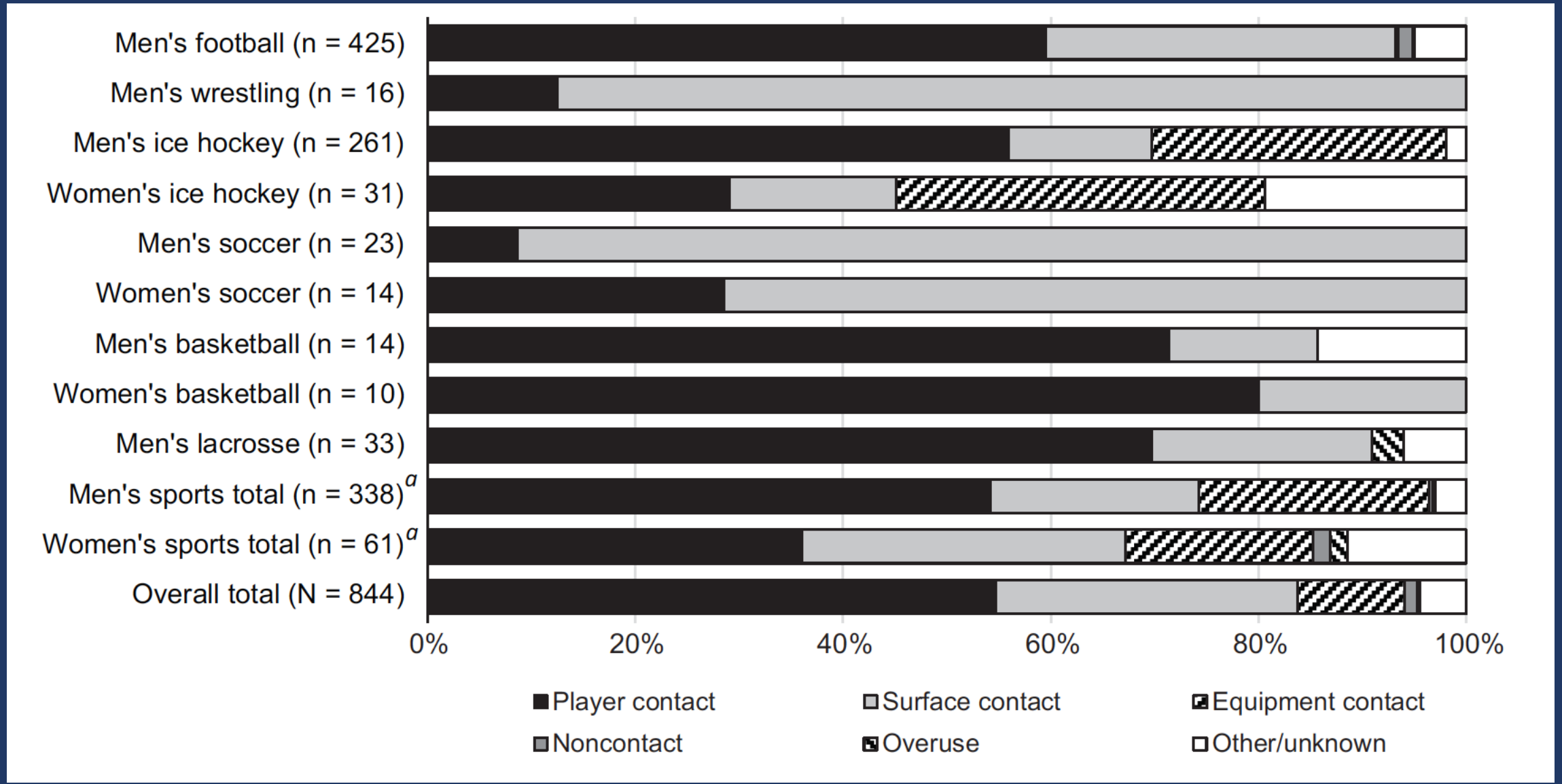
Epidemiology of Acromioclavicular Joint Sprains in 25 National Collegiate Athletic Association Sports

2009-2010 to 2014-2015 Academic Years

Investigation performed at the Datalys Center for Sports Injury Research and Prevention Inc, Indianapolis, Indiana, USA

- Rate of 1.72 per 10,000 athletic exposures
- Football, ice hockey and wrestling
- Games led to 8.58X increase in injury compared to practice
- 54.7% by player contact and 29% by surface contact
- 1% required surgery

Hibberd et al. AJSM 2016


Men's football (n = 425)
Men's wrestling (n = 16)
Men's ice hockey (n = 261)
Women's ice hockey (n = 31)
Men's soccer (n = 23)
Women's soccer (n = 14)
Men's basketball (n = 14)
Women's basketball (n = 10)
Men's lacrosse (n = 33)
Men's sports total (n = 338)a
Women's sports total (n = 61)a
Overall total (N = 844)
0%
20%
40%
60%
80%
100%
Player contact
Surface contact
Equipment contact
Noncontact
Overuse
Other/unknown

Epidemiology of Acromioclavicular Joint Injury in Young Athletes

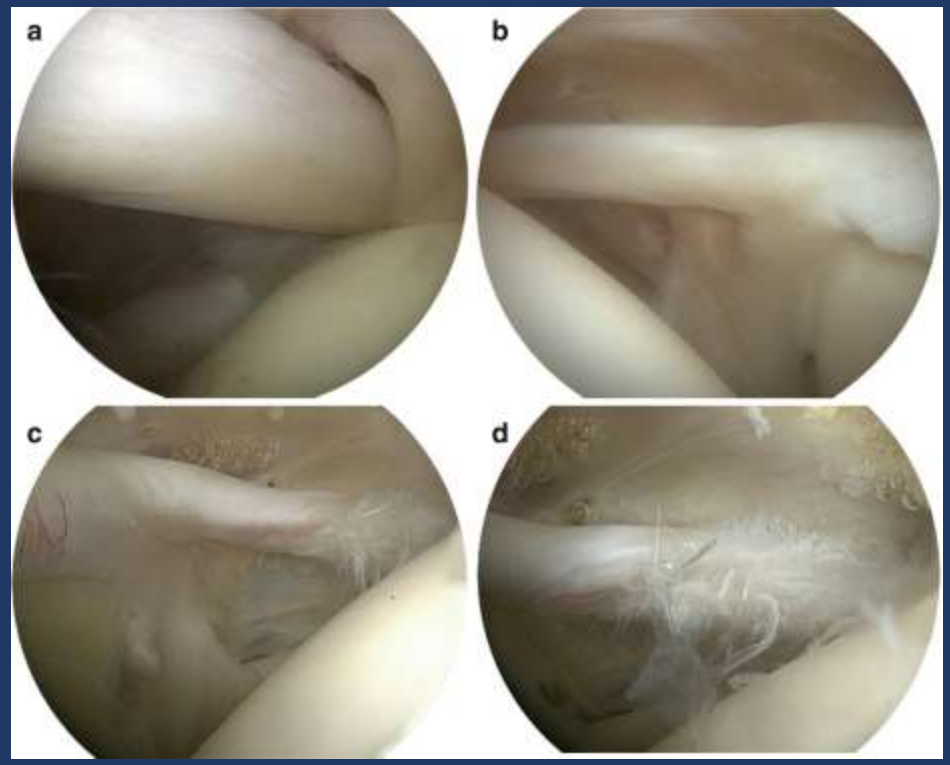
LTC Mark Pallis,* DO, Kenneth L. Cameron,* PhD, ATC, MPH,
LTC Steven J. Svoboda,* MD, and LTC Brett D. Owens,*† MD
Investigation performed at the Keller Army Hospital, United States Military Academy, West Point, New York

- 9.2 injuries per 1000 person years
- 89% low grade
- Rugby, wrestling and hockey highest incidence
- Average time lost 18.4 days
  - 10.4 days for low-grade and 63.7 for high-grade
- 71% of high-grade injured patient elected to have surgery

AJSM 2012

Associated Injuries

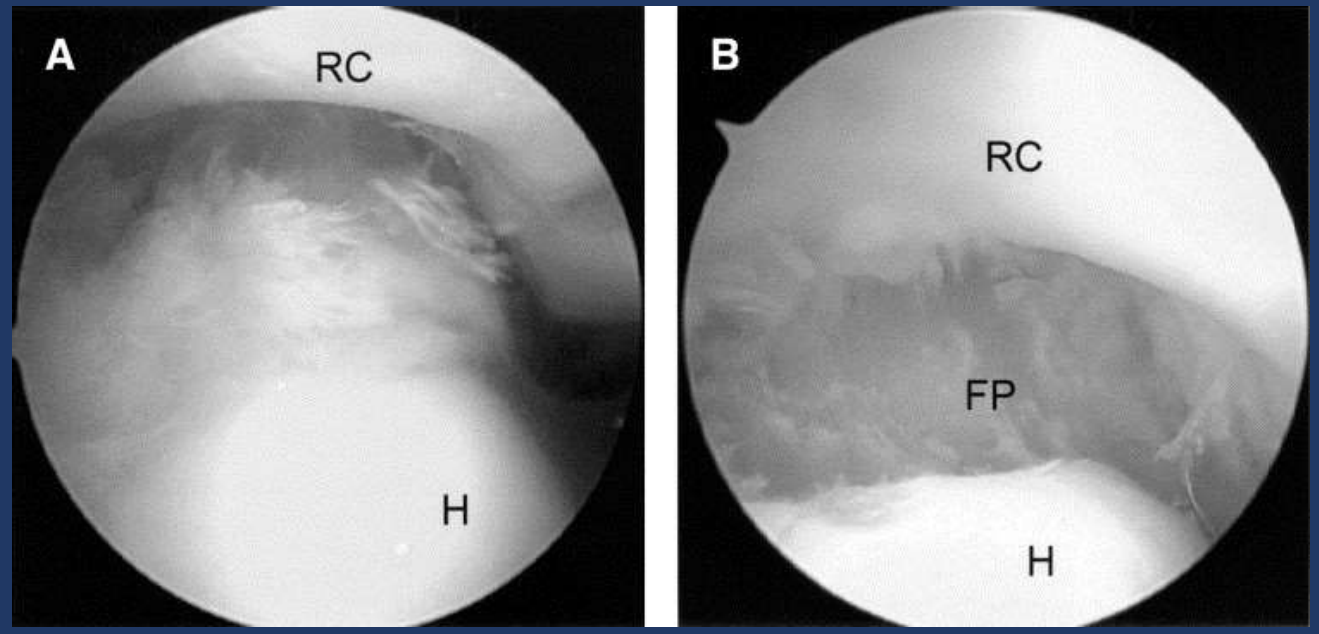
- 376 patients undergoing arthroscopic AC joint reconstruction
- 201 (53%) had concomitant GH pathology (biceps and RC pathology)
- 45 (12%) underwent additional repair
- Rockwood V and chronic injury were associated with a higher rate
- Increased age was the most dominant predictor of concomitant pathology.



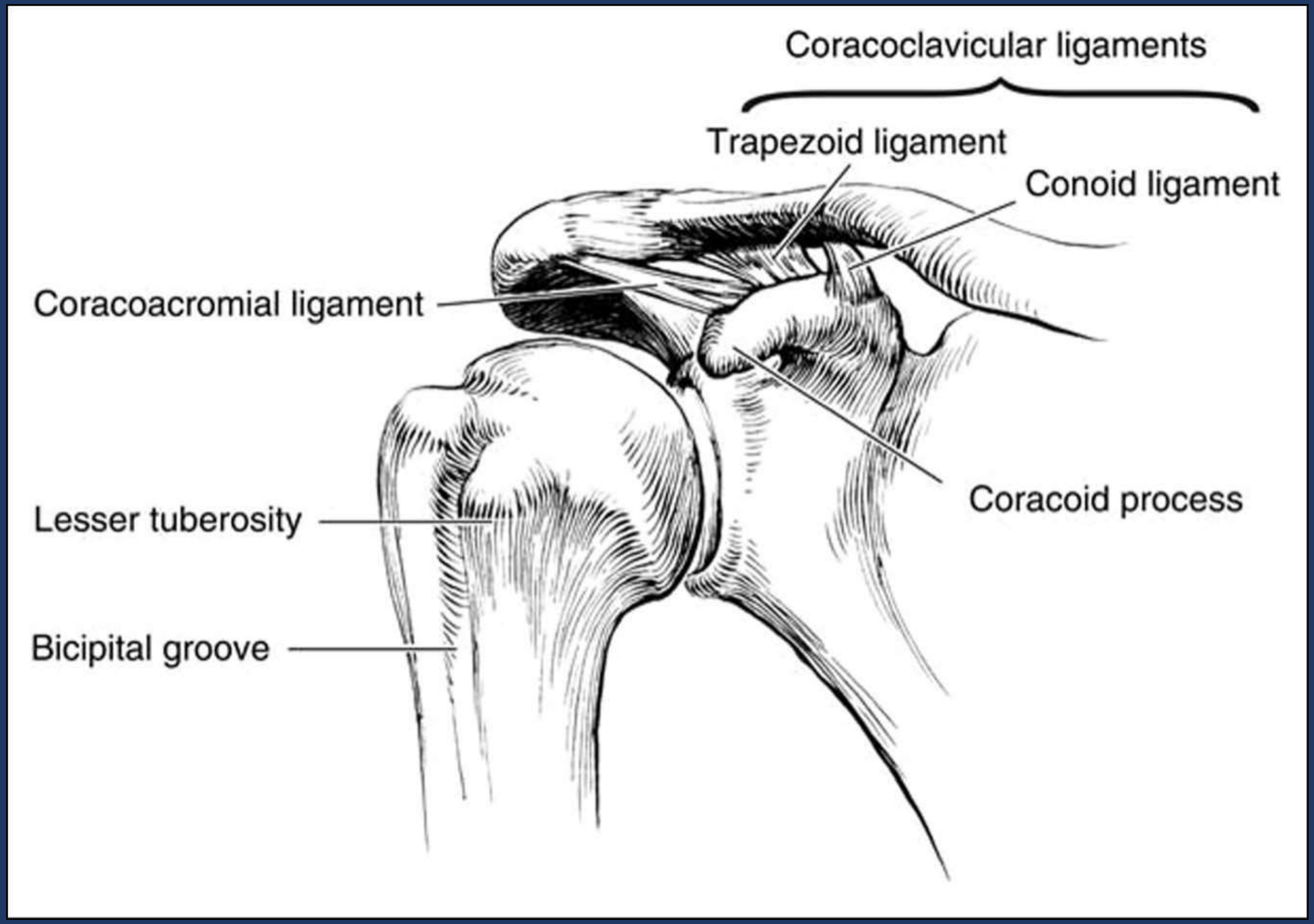
Jensen et al. Inter Ortho 2017

Associated Injuries

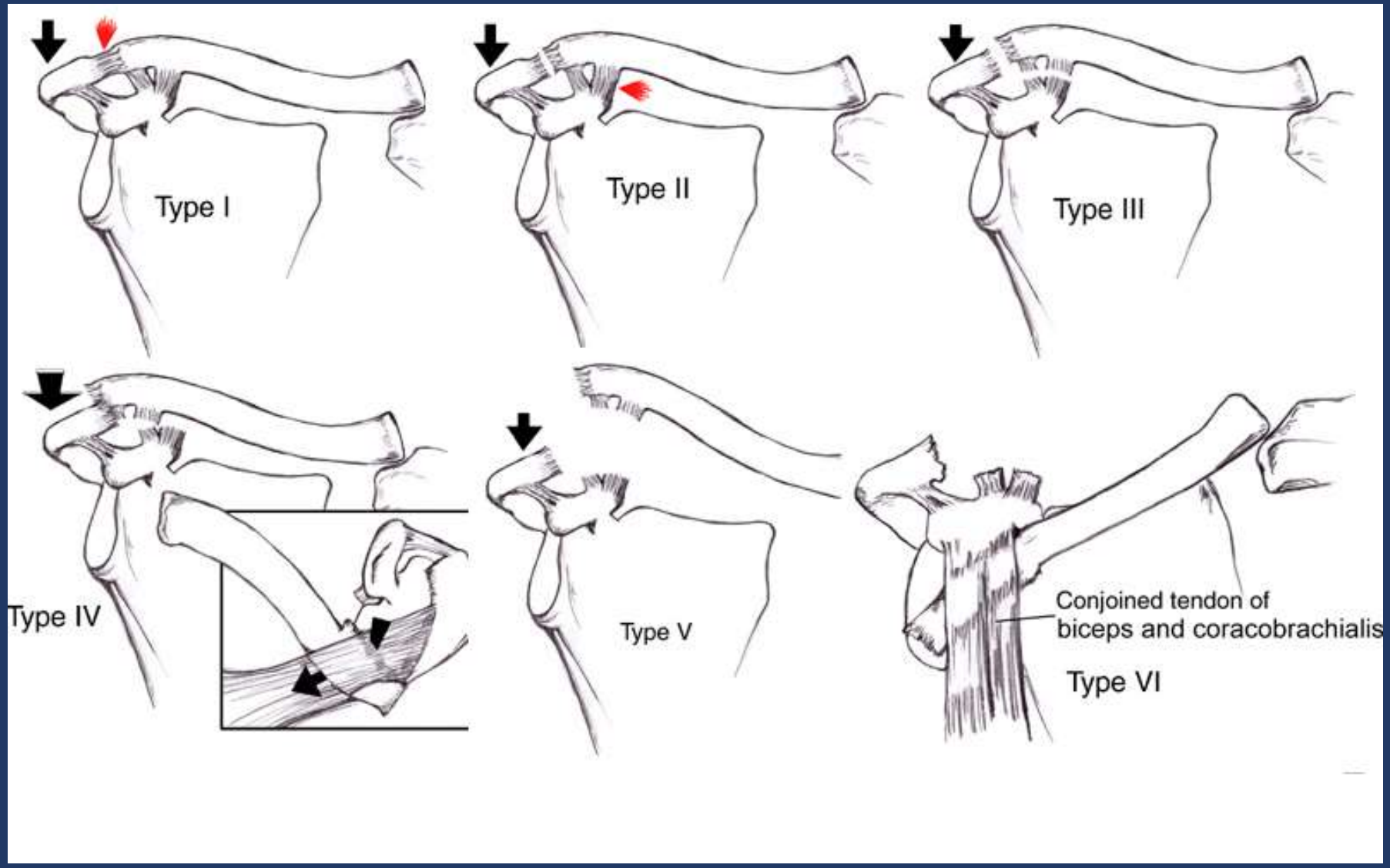
- 163 patients undergoing arthroscopically associated reconstruction
- Concomitant pathology in 39.3% of patients (57.3% of patients over 35)
- Cuff injuries (32.2%), chondral defects (30.6%), SLAP lesions (22.6%)



Markel et al. BMC Musculoskeletal Disorders 2017


Coracoclavicular ligaments
Trapezoid ligament
Conoid ligament
Coracoacromial ligament
Coracoid process
Lesser tuberosity
Bicipital groove

Classification

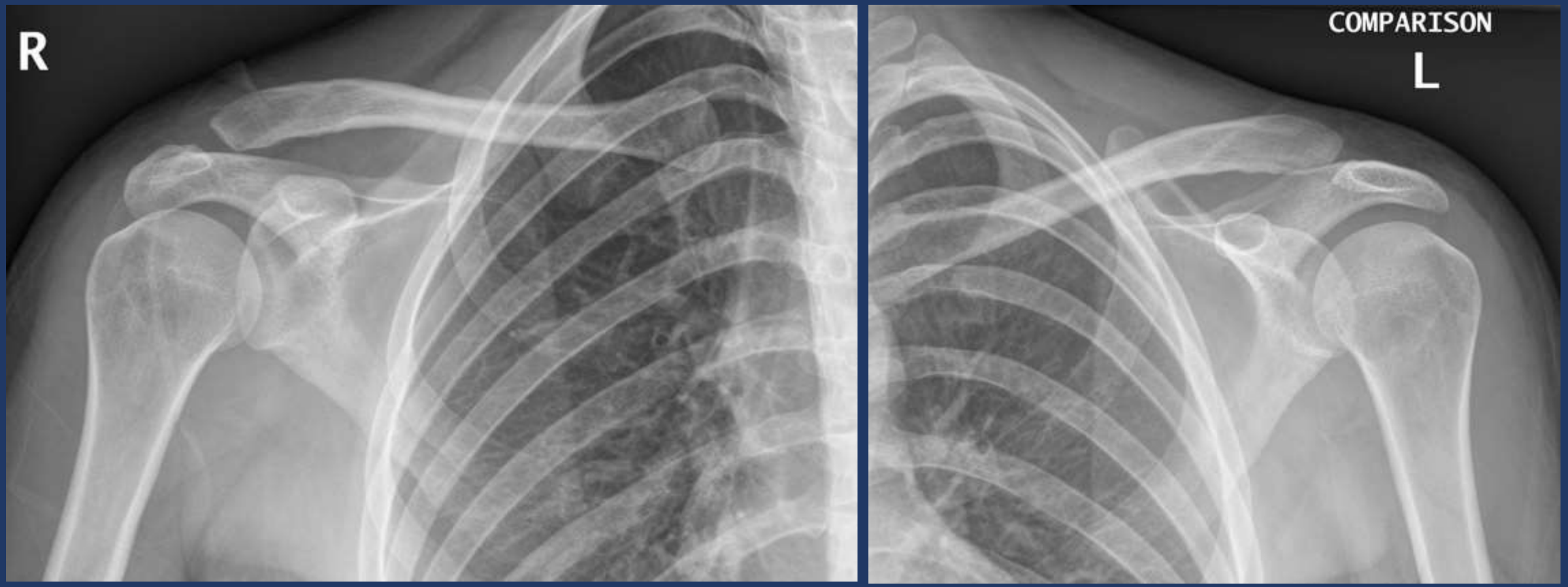


Diagnosis

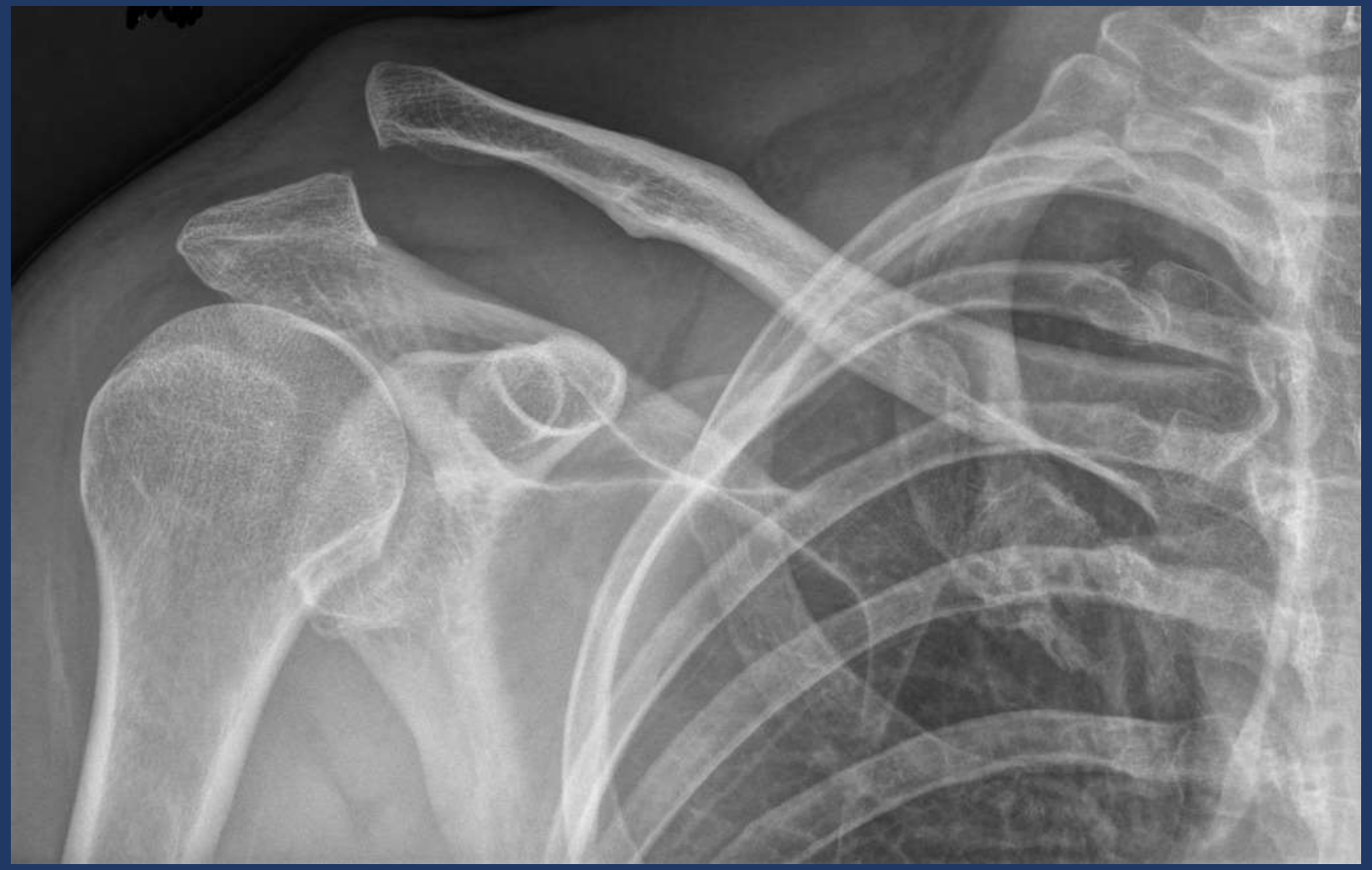
- Cross body abduction (Highest sensitivity of 77%)
- AC Resisted Extension Test (72% Sensitivity)
- Active Compression Test (41% Sensitivity 95% Specific)
- Active compression highest overall accuracy 92%

Chronopoulos et al,. AJSM 2004

Type 1-2 AC Joint Sprain

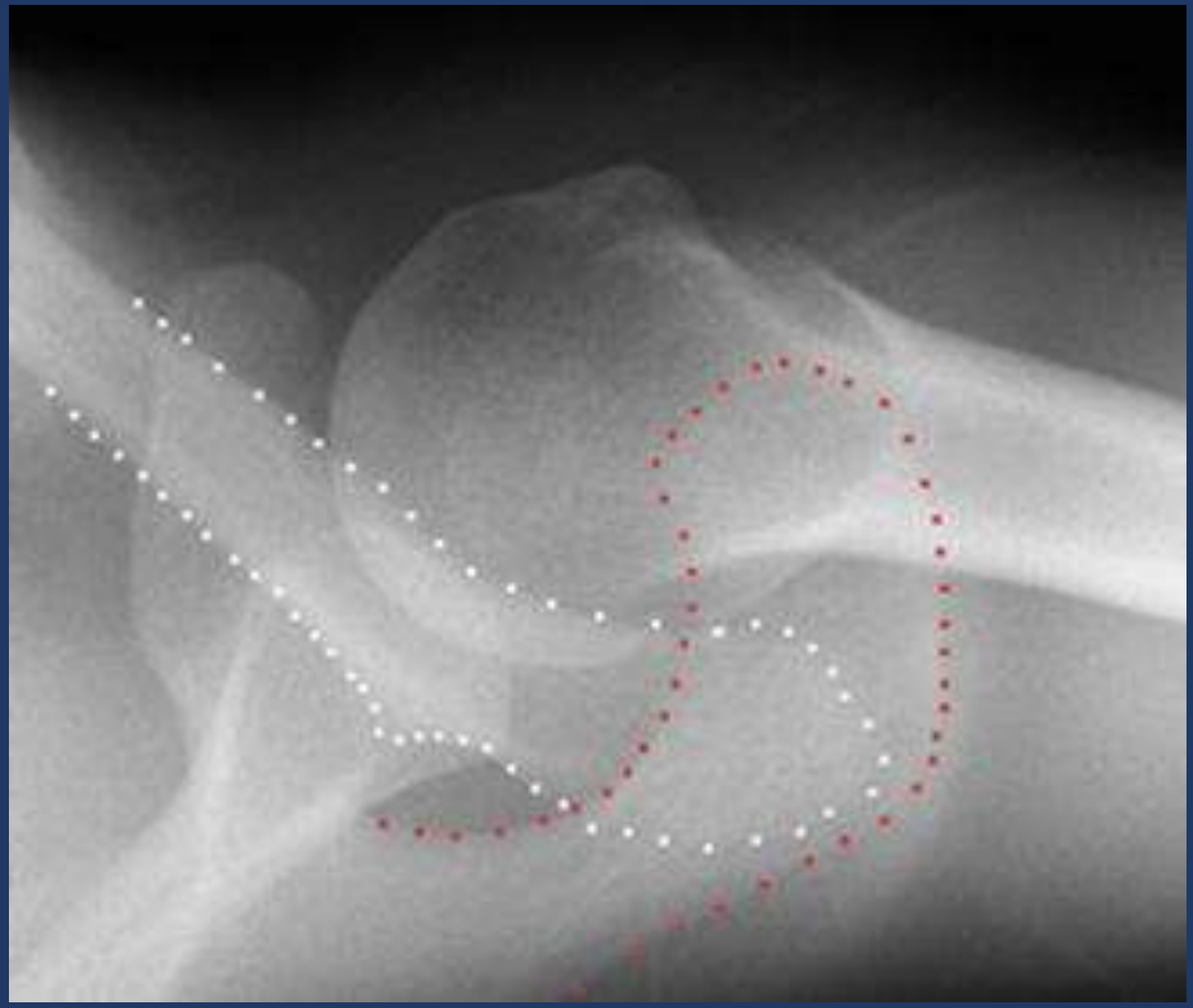


Grade 3 AC Sprain



Type V

Type IV



Treatment Options

- Grade I and II: Non-operative
- Grade IV-VI: Operative
- Grade III: ?

Type I&II Treatment

- Immobilization in simple sling
  - 1-3 week for Type I
  - Longer for Type II
- Physical therapy
  - Within first 2 weeks to improve ROM
  - Strengthening can begin after full ROM obtained
- Injections
- NSAIDS

- 134 patients with 6.3-year follow-up
- Patients with Type I injuries were immobilized in a sling for an average of 19.5 days
  - Symptoms lasted 6 weeks
- Patient with Type II injuries were immobilized an average 27 days
  - Symptoms lasted 6 weeks

Park et al. AJSM 1980

Type I &II Return to Play

- Contact sports and heavy lifting avoided for 1 month
- Return to full activities may take as long as 2-3 months
- Criteria for RTP:
  - Pain free
  - Full ROM of shoulder
  - 90% strength on injured side compared to un-injured

Type I & II Outcomes (Frank et al. JAAOS 2019)

Table 4

Summary of Clinical Outcomes of Nonsurgical Management of Type I and II ACJ Injuries

Authors	Methods	Results
Mouhsine et al.[29]	33 patients with acute type I and II injuries treated with ice, analgesics, and sling immobilization at an average 6.3-yr follow-up	9 patients (27%) progressed to undergo surgical intervention.
	29 patients (85%) were athletes.	Of the remaining 24 patients, 17 (52%) remained asymptomatic at final follow-up.
Shaw et al.[30]	47 patients with grades I or II (Allman) injuries treated with analgesics and broad-arm sling immobilization	40% of patients reported significant pain at 6-mo follow-up.
		20% reported restricted ROM at 6 mo.
		Positive correlation found between symptoms at 6 mo and those persisting beyond 1 yr ($P < 0.01$)
Mitek[23]	23 patients with type I or II injuries evaluated at an average 10.2-yr follow-up after nonsurgical treatment	52% reported at least occasional symptoms
		Constant score ($P < 0.001$), SST ($P < 0.002$), and UCLA Shoulder Scale ($P < 0.001$) were all significantly lower in injured shoulder compared with contralateral.
		Demonstrates potential for ACJ injuries to have long-term effects

ACJ = acromioclavicular joint, ROM = range of motion, SST = Simple Shoulder Test, UCLA = University of California, Los Angeles

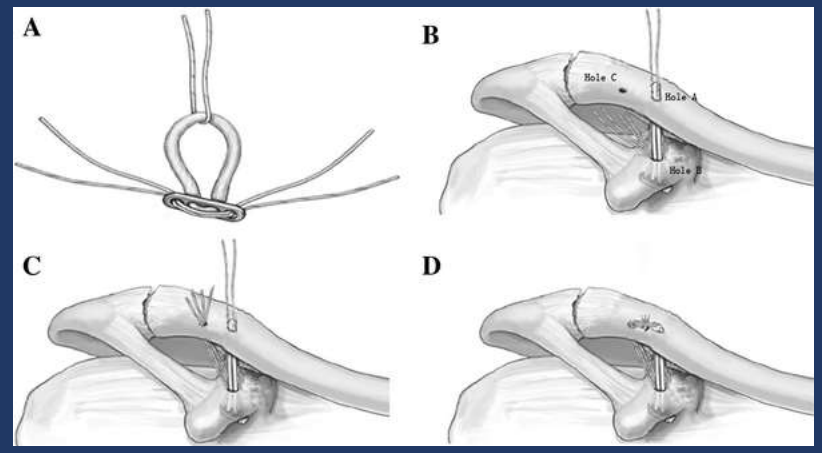
Operative versus non-operative management following Rockwood grade III acromioclavicular separation: a meta-analysis of the current evidence base

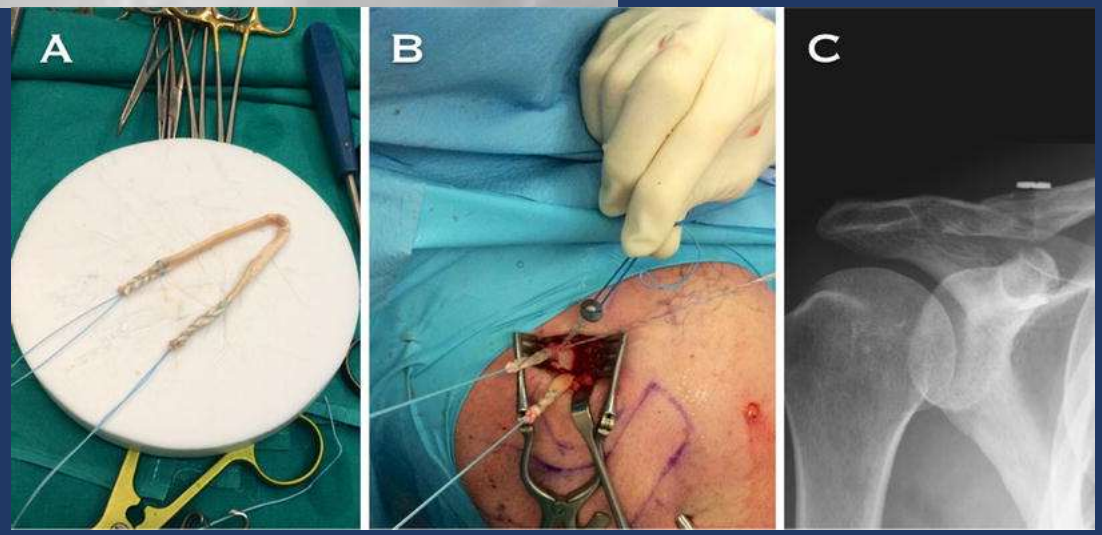
Toby O. Smith · Rachel Chester · Eyiyemi O. Pearse · Caroline B. Hing

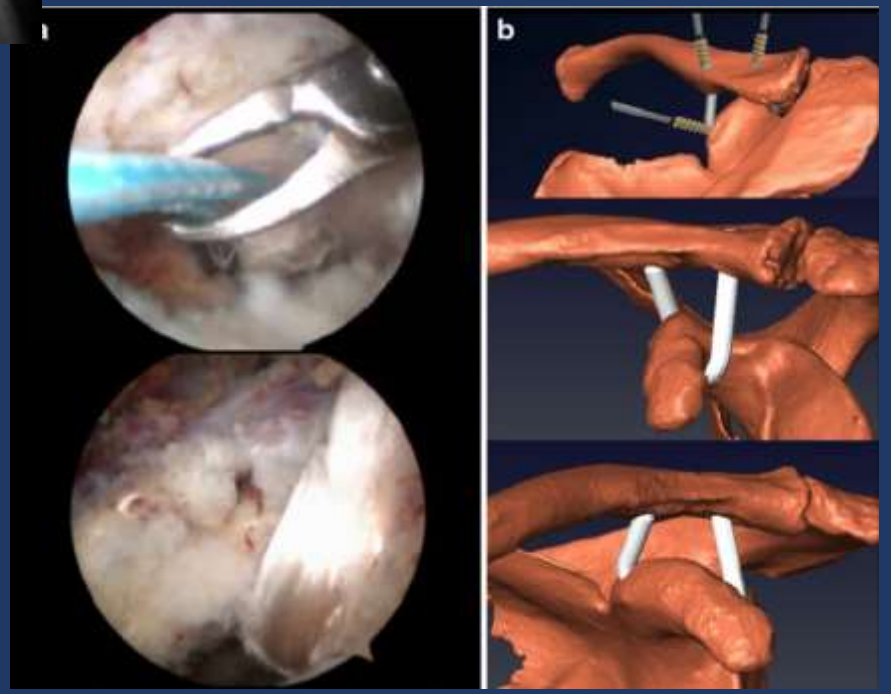
- Operative treatment led to better cosmetic outcome
- Longer sick leave following surgery
- No difference in strength, pain, ability to throw or incidence of AC joint arthritis between op and non-op treatment

Smith et al. J of Orthopaed Traumatol 2011

Type IV-VI Treatment







My Preferred Method

Current Concepts in the Operative Management of Acromioclavicular Dislocations

CME

- 58 articles with 1704 patients
- Overall failure rate was 20.8%
- Overall complication rate 14.2%
  - Infection (6.3%)
  - Fracture of coracoid/distal clavicle (5.7%)
  - Hardware/button failure (4.2%)
- No difference between arthroscopic or open technique with regard to loss of reduction, overall complication rate and revision rate
- Open surgery had greater rate of fracture

Gowd et al. AJSM 2019

Return to work after acromioclavicular joint stabilization: a retrospective case control study

Felix Porschke, Marc Schnetzke, Stefan Studier-Fischer, Paul Alfred Gruetzner and Thorsten Guehring*

- Retrospective review of 54 patients
- 94.5% were able to return to work at final follow up
  - 100 % of non-manual labor workers
  - 91% of manual labor
- Median time of RTW was 13 weeks (5-143 weeks)
  - Non-manual labor: 6 weeks
  - Manual labor: 15.5 weeks
- 55.9% of manual labor workers had persistent shoulder symptoms compared to 5 % of non-labor workers

J of Ortho Surgery and Research 2019

Return to sport after surgical treatment for high-grade (Rockwood III–VI) acromioclavicular dislocation

D. E. Verstift[1] · C. L. Welsink[1] · A. J. Spaans[1] · M. P. J. van den Bekerom[1]

Received: 22 January 2019 / Accepted: 29 April 2019 / Published online: 14 May 2019

- 12 studies with 498 patients
- 94% return to sport
  - 84% to same level
  - 10% to lower level
- Mean return time was 4 months
- Mean Constant score at final follow up was 92

Knee Surg Sports Traumatol Arthoscop 2019

Systematic Review

Return to Sport and Clinical Outcomes After Surgical Management of Acromioclavicular Joint Dislocation: A Systematic Review

Jeffrey Kay, M.D., Muzammil Memon, M.D., and Bashar Alolabi, M.D., F.R.C.S.C

- 12 studies with 315 patients
- RTP ranged from 94-100%
- RTP at pre-injury level 62-100%
  - Type V: 86.2%
  - Type III-IV: 89.6%

Arthroscopy 2018

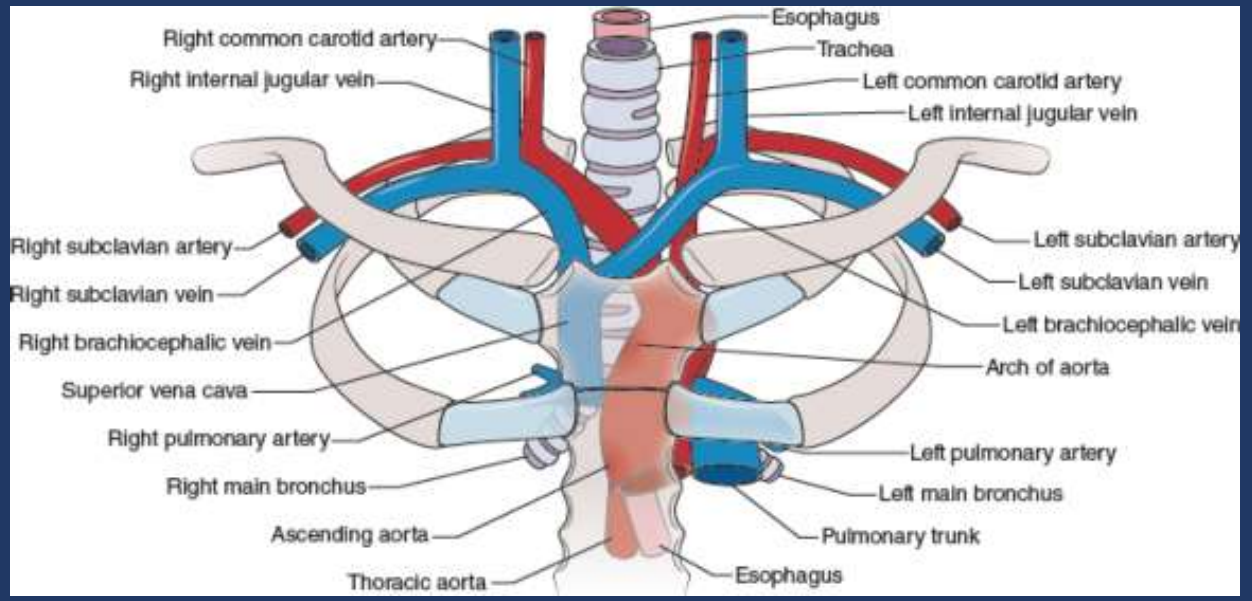
AC Joint Injury Conclusion

- A majority of AC joint injuries are low grade and can be treated non-op
- Many surgical options are available for high-grade injuries and no gold-standard procedure exists
- Outcomes are typically good regardless of treatment method
- Return to sport after non-op and operative treatment is high

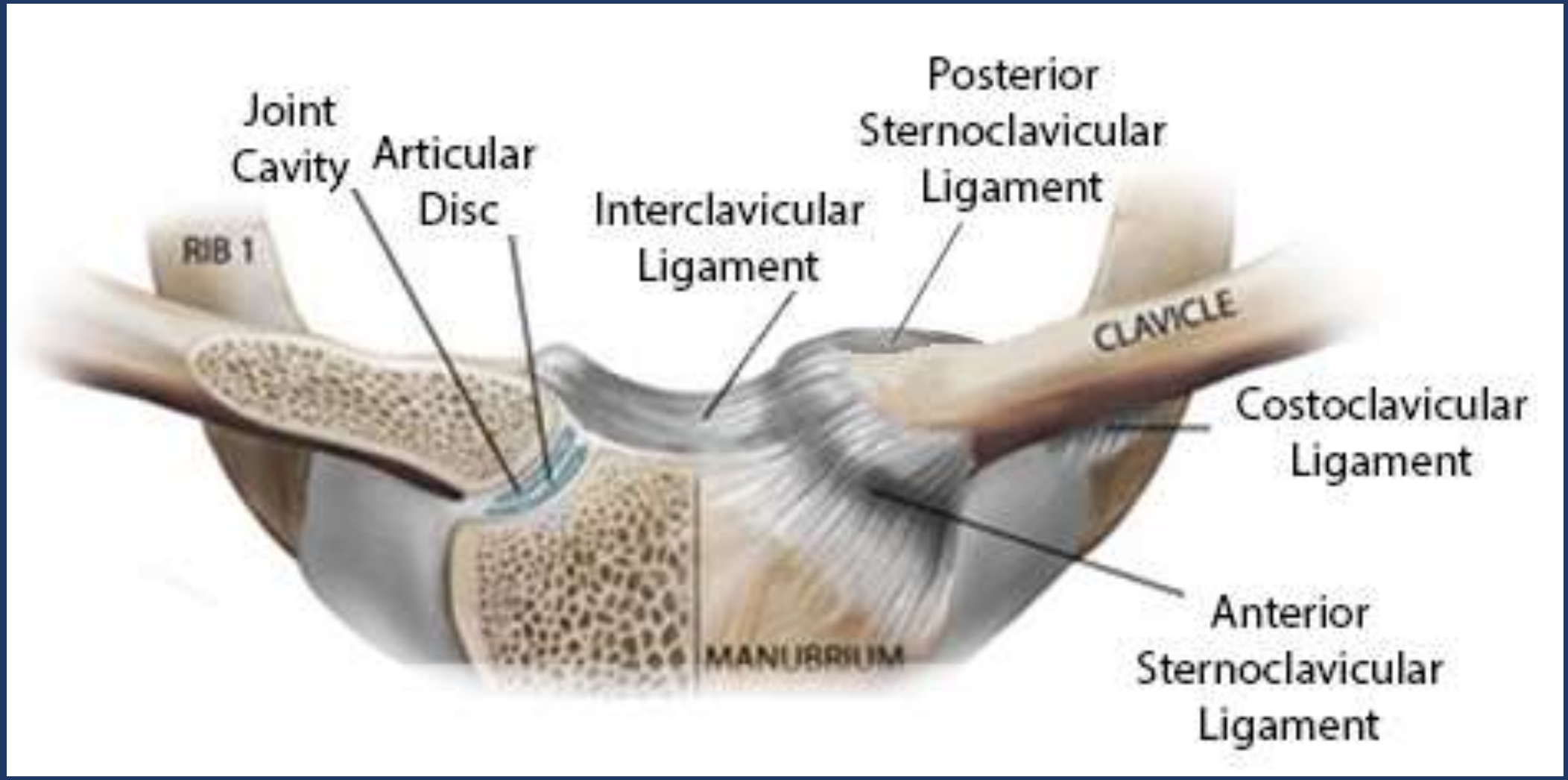
SC JOINT INJURIES

Overview

- Make up 3% of all shoulder girdle injuries
- Associated with severe life-threatening complications



SC Joint Anatomy



SC Joint Injury Mechanisms

- Typically tremendous force
- Indirect forces
  - Most common mechanism
  - MVA
  - Results in either anterior or posterior dislocations
- Direct anteromedial force to the joint pushes clavicle posteriorly
  - Athlete jumped on while supine
  - Direct kick to the medial clavicle

SC Joint Injuries

- Sprain
  - Ligaments remain intact
  - No instability noted
- Subluxation
  - Ligaments are stretched
  - Allows for subtle motion of the joint
- Dislocation
  - Severe pain and deformity
  - Swelling will make it difficult to determine if the dislocation is anterior or posterior
  - Compression of mediastinal structures is possible

SC Joint Radiographic Evaluation

- Plain Radiographs
  - Routine xrays are difficult to interpret due to overlap of underlying structures
  - Serendipity View

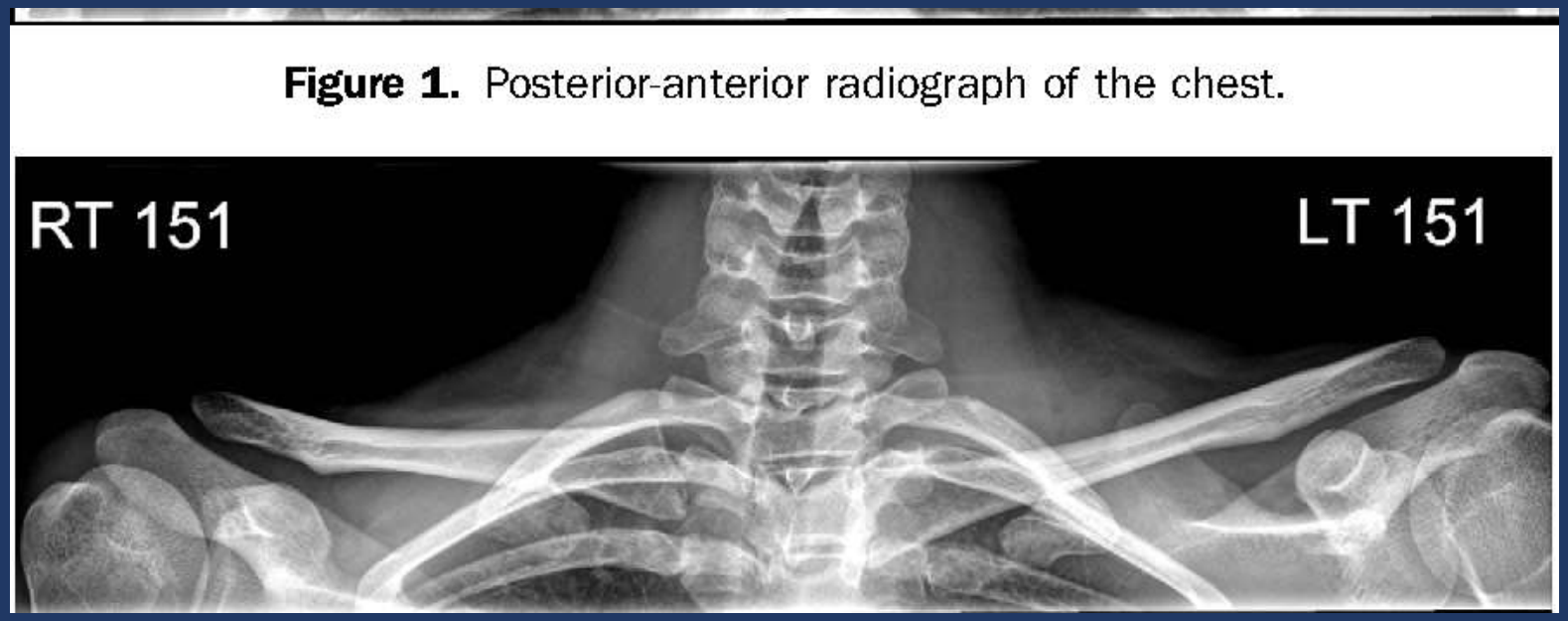
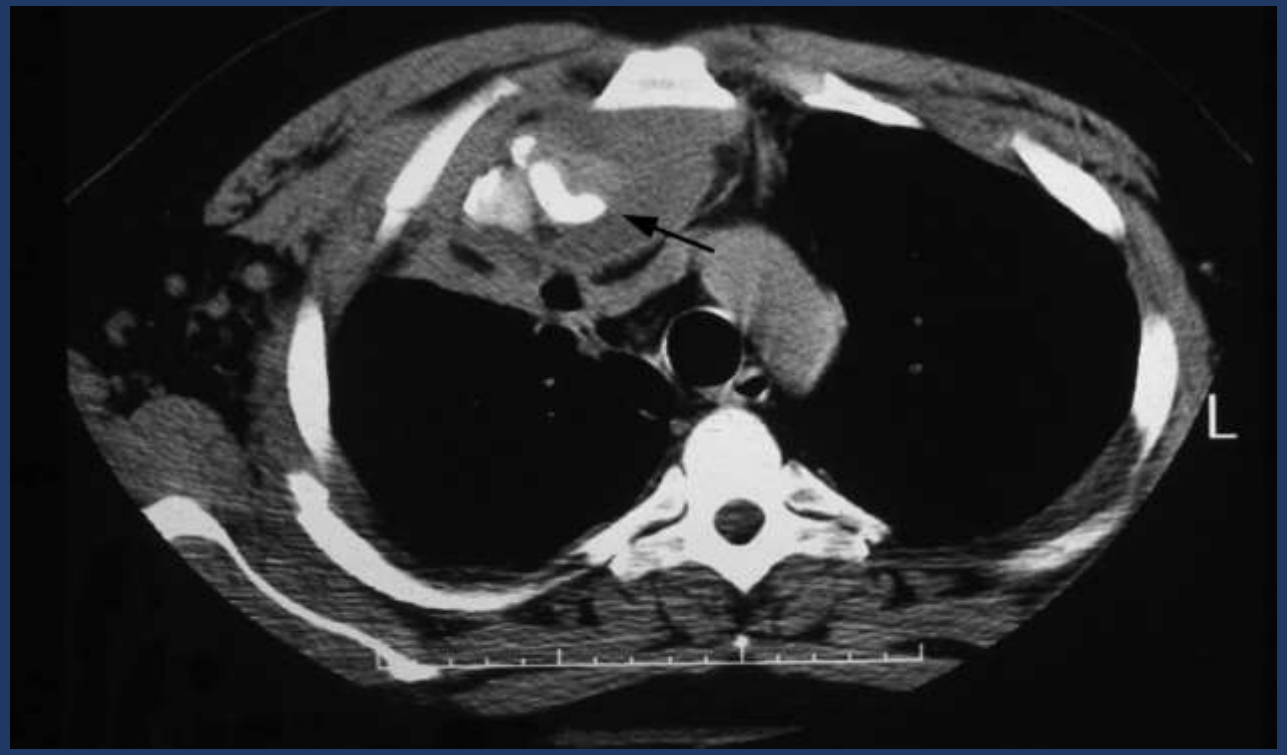


Figure 1. Posterior-anterior radiograph of the chest.

SC Joint Radiographs

- CT is more effective than radiographs
- If you’re concerned about a SC joint dislocation, order an CT
- MRI is useful in younger patients to differentiate between SC and medial epiphyseal injuries



SC Joint Management

- Anterior Strain and Subluxation
  - Ice and analgesics
  - Subluxation can be reduced by directing the shoulders posteriorly and medially
  - Clavicle strap or sling
  - Immobilize for 6 weeks

Anterior Dislocation

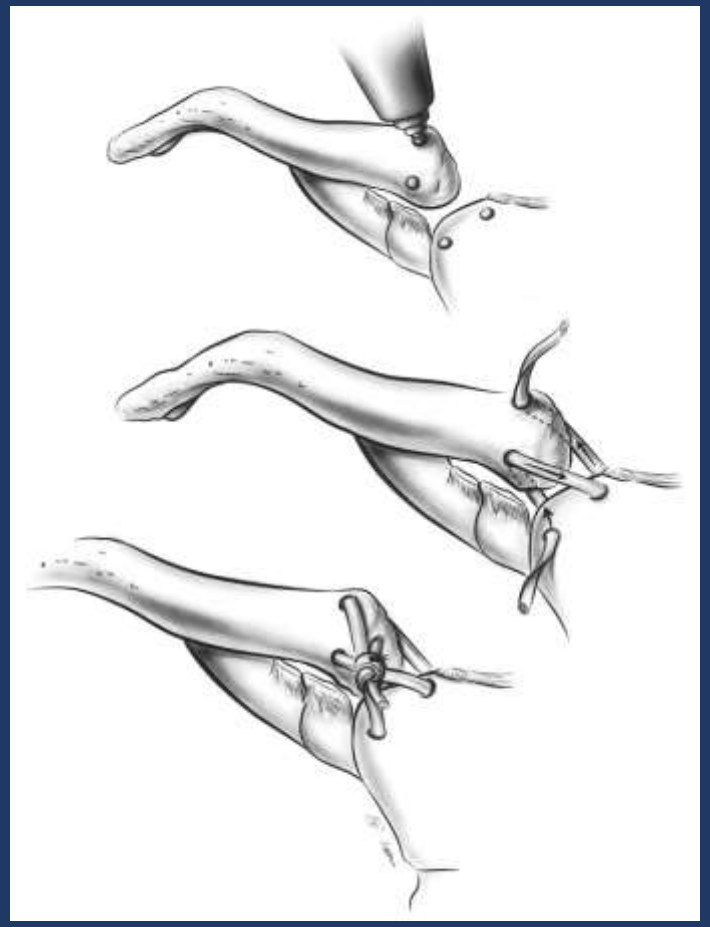
- Closed reduction
  - If stable after reduction, sling
  - Most are unstable after
    - Leave it
    - Open reduction and fixation

Posterior Dislocation

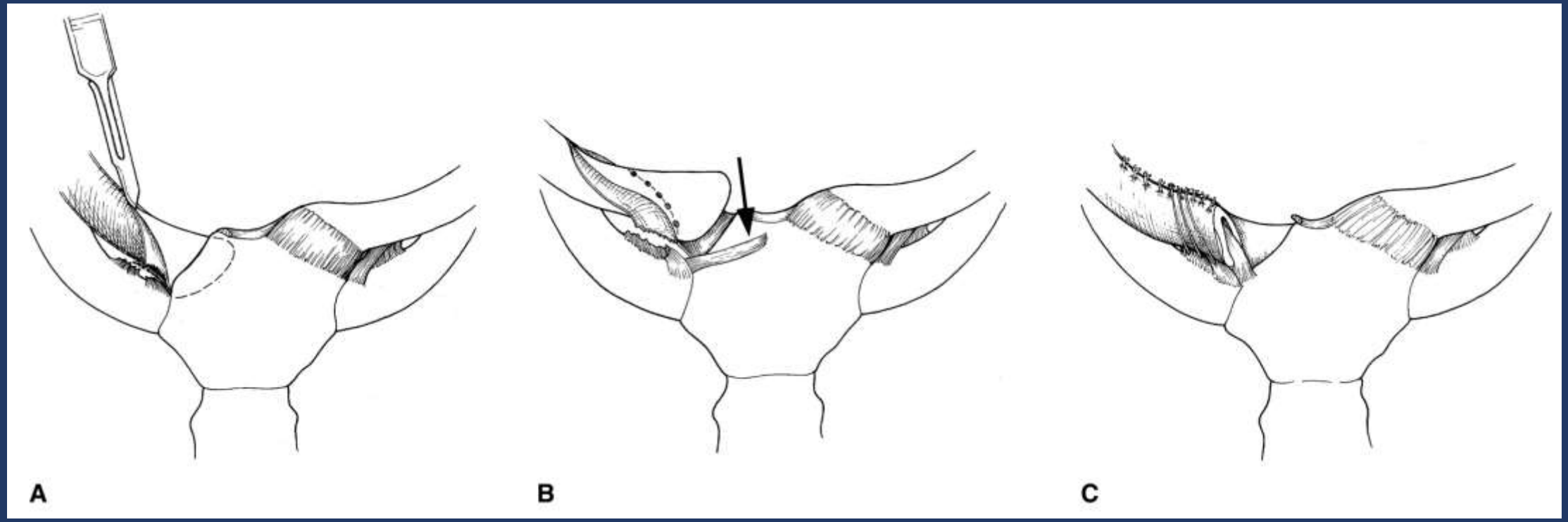
- Look for concerning signs
  - Dyspnea
  - Chocking
  - Hoarseness
- Closed Reduction
  - Most are stable after reduction
  - Have thoracic surgeon available
  - Sling for 4 weeks

Posterior Dislocation

- Open Reduction
  - Failed closed reduction in patients with closed physis
  - Thoracic surgeon available
  - Figure-of-8



Posterior Dislocation



Post Operative Care

- Figure-of-8 clavicle splint for 4 weeks
- Sling is used for an additional 6-8 weeks
- No arm elevation >60 degrees
- After 12 weeks, may gradually increase the use of the arm
- Patients undergoing medial resection should not return to heavy labor

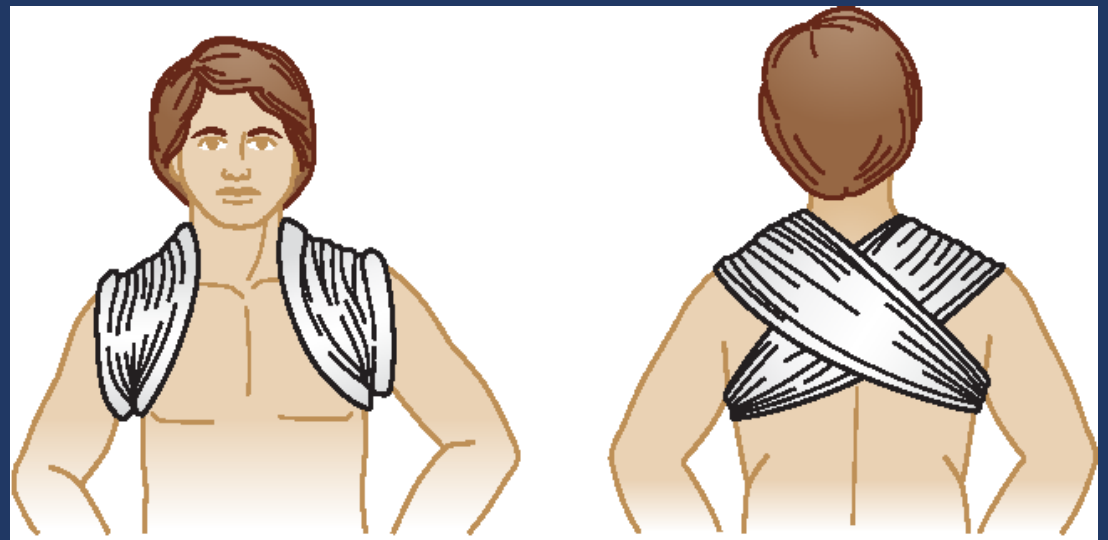
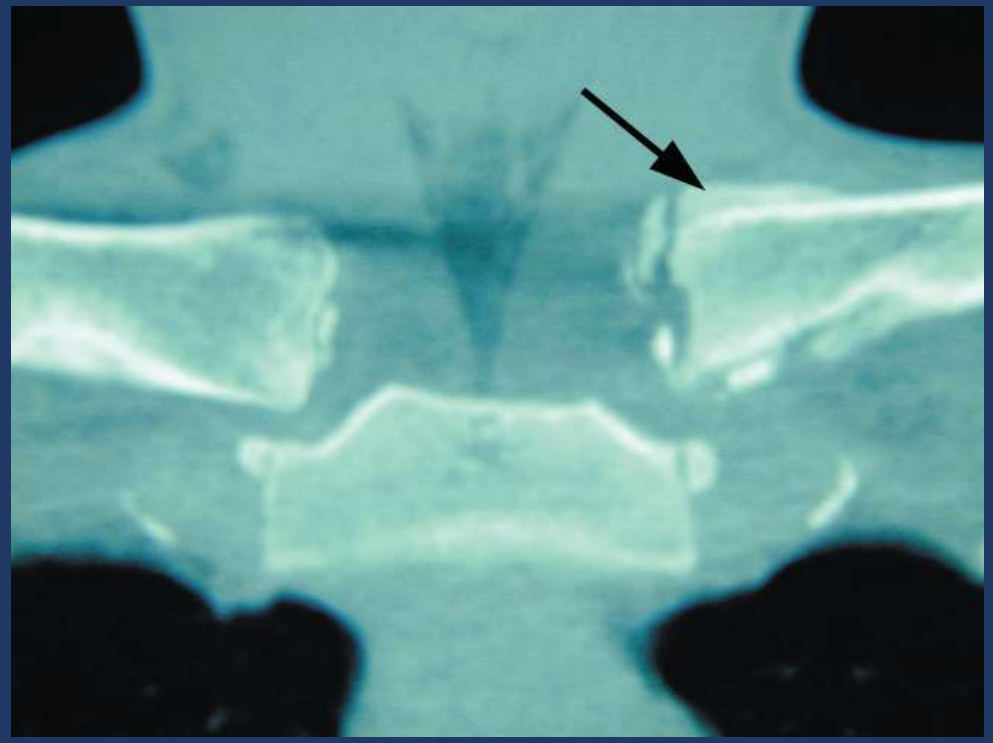


Fig. 87.13 Clavicular (figure-of-eight) splint.

Physeal Injuries of the Medial Clavicle

- Closed reduction
- Open reduction is seldom indicated, except for irreducible posterior displacement with symptoms of compression
- Figure-of-8 or sling for 4 weeks



Surgical Complications

- Postoperative infections
- Loss of reduction
- Posttraumatic arthritis
- Pin migration

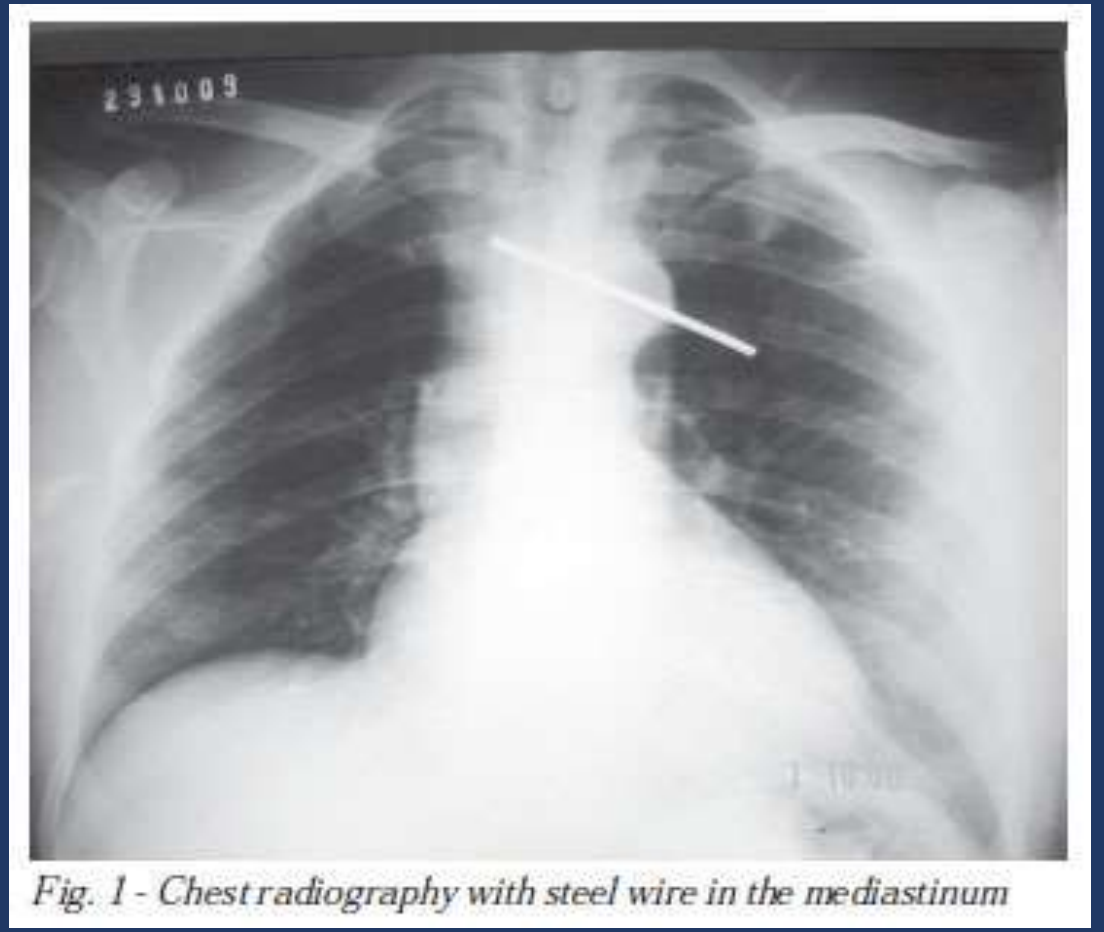


Fig. 1 - Chest radiography with steel wire in the mediastinum

Questions?