Clavicular and AC lesions in cyclists

Speaker:

Gert Van den Bogaert, Md
Shoulder surgeon
Orthopedie Herentals, Belgium

Clavicular and AC lesions in cyclists

Acknowledgement:

Toon Claes, Md
Shoulder surgeon
Orthopedie Herentals, Belgium

Clavicular fractures and AC dislocations **in cyclists**

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Clavicular fractures and AC dislocations

A **Anatomy**

B **Mechanisms of injury**

C **Treatment**

D **Complications**

E **After treatment**

Clavicular fractures and AC dislocations

A **Anatomy**

B **Mechanisms of injury**

C **Treatment**

D **Complications**

E **After treatment**

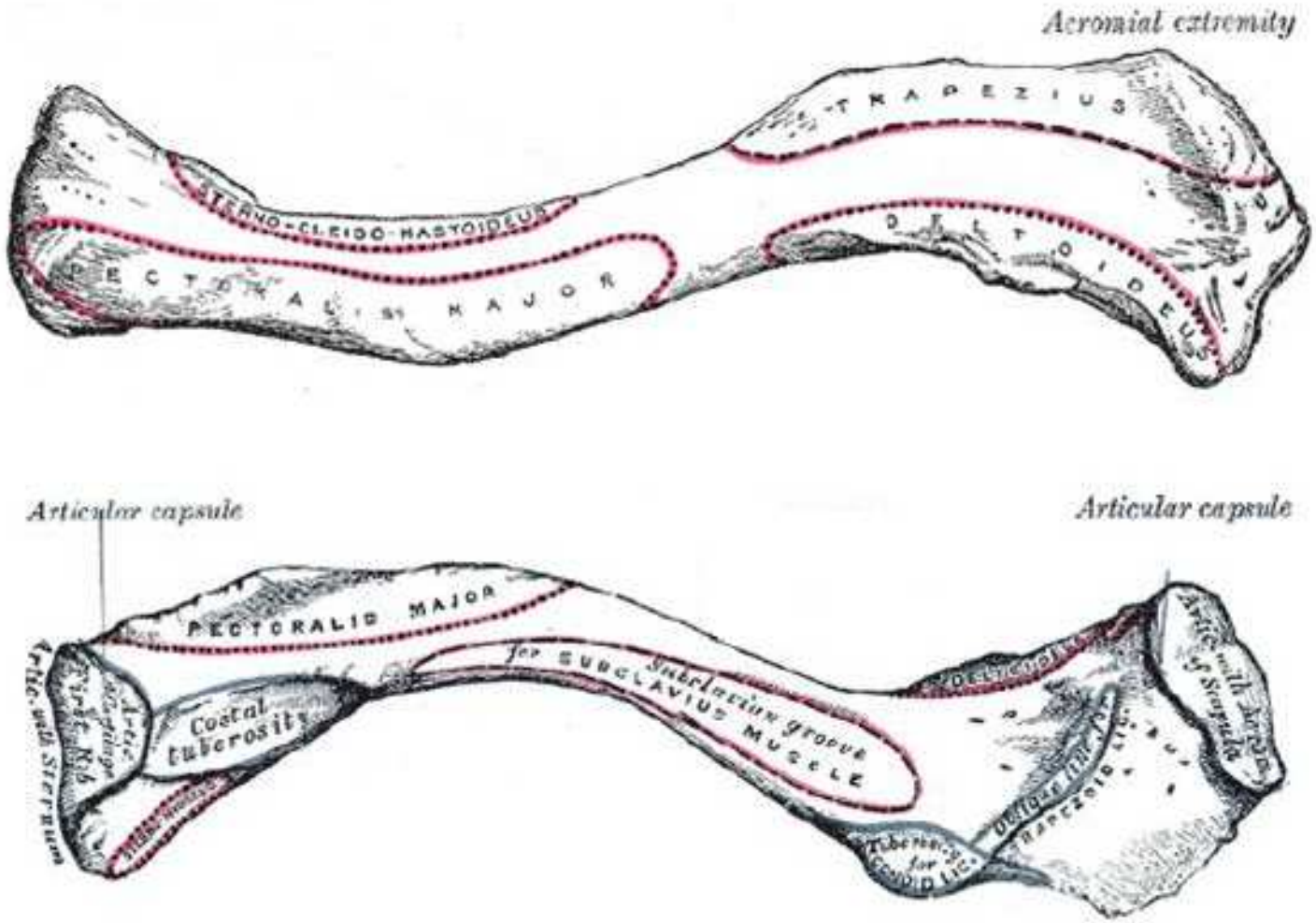


Image: clavicle/collar bone, superior & inferior views

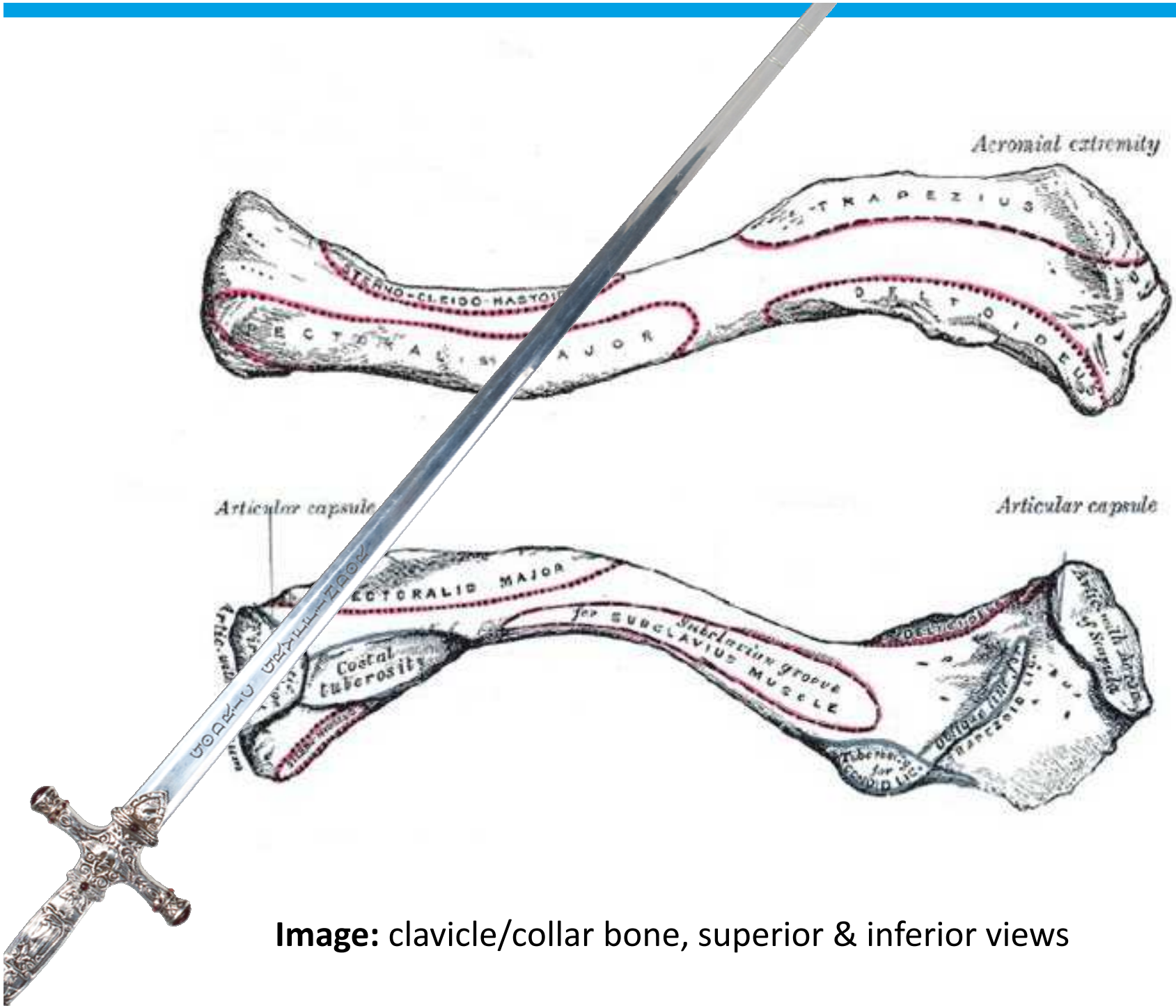
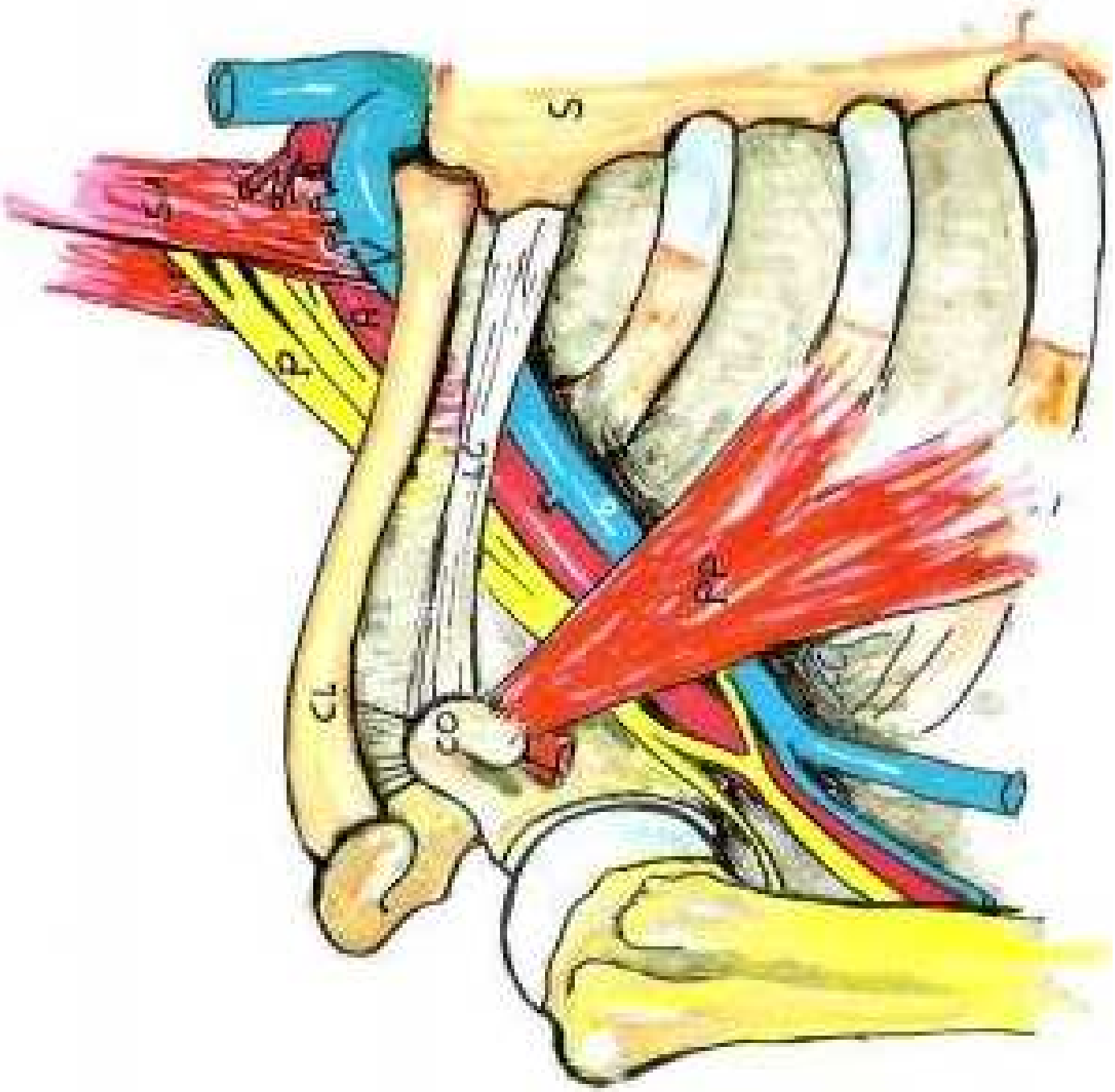


Image: clavicle/collar bone, superior & inferior views


S
E
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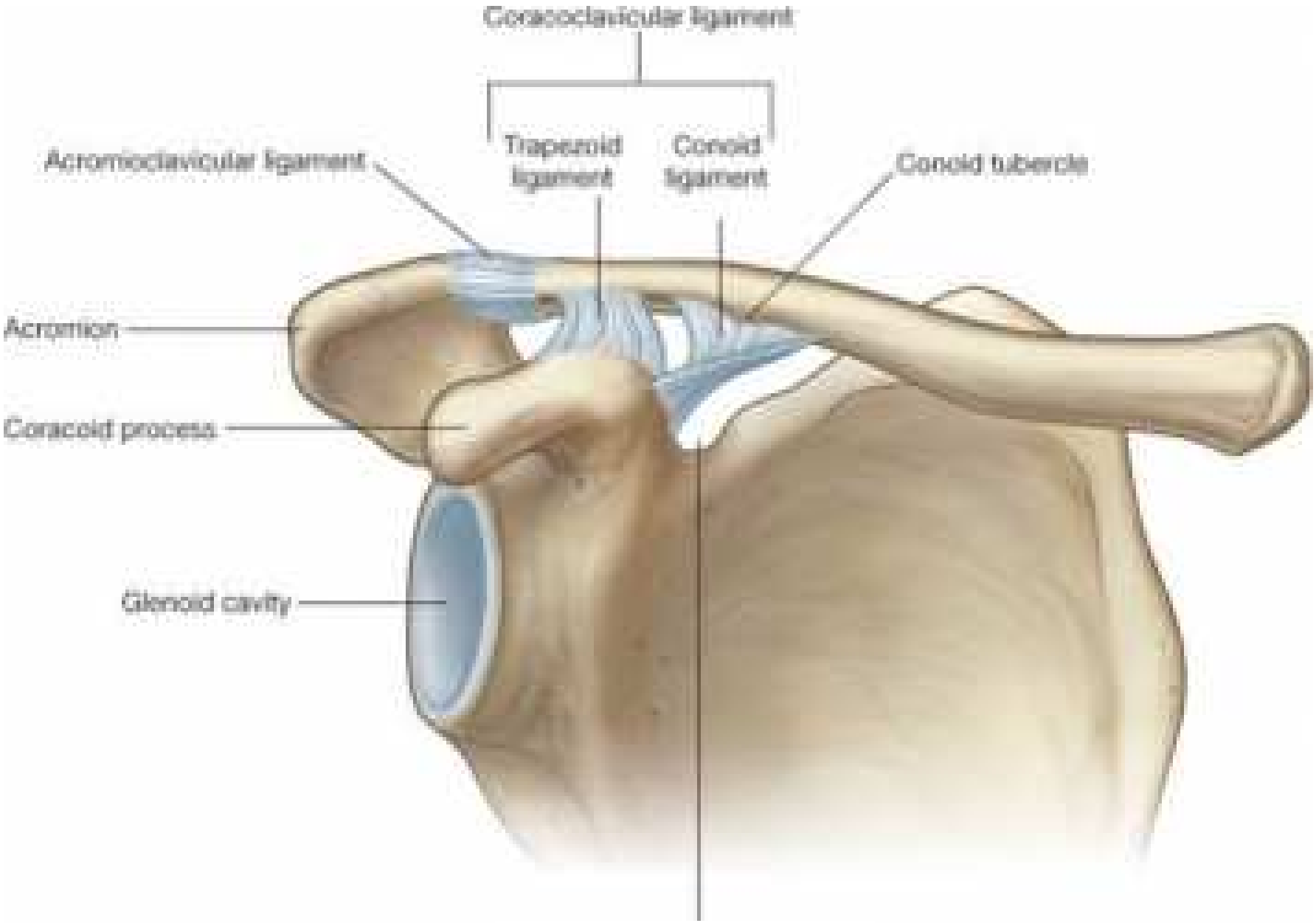
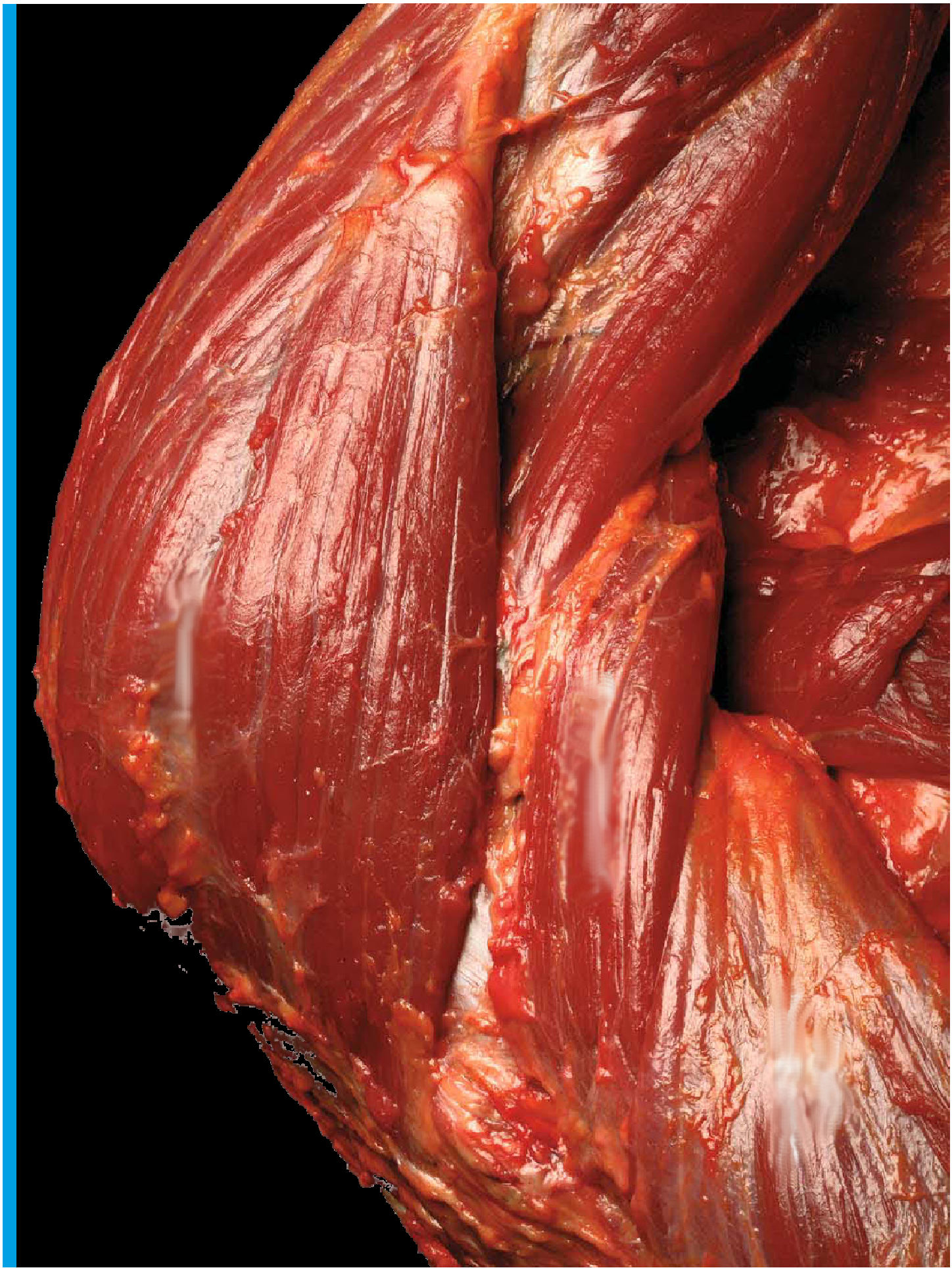

Coracoclavicular ligament
Trapezoid ligament
Conoid ligament
Acromioclavicular ligament
Conoid tubercle
Acromion
Coracoid process
Glenoid cavity



Clavicular fractures and AC dislocations

A Anatomy

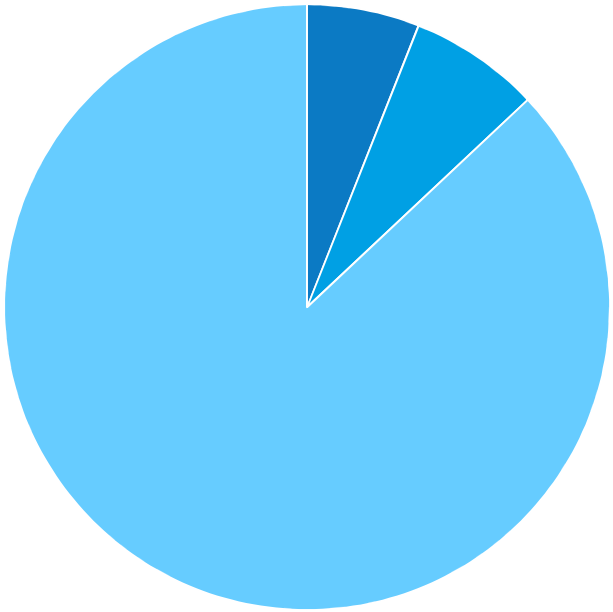
B **Mechanisms of injury**

C Treatment

D Complications

E After treatment

Statistics



Direct blow	6%
Fall on outstretched arm	7%
Direct fall on the shoulder	87%


bianchi
ORBEA

QUICK-STEP


TV
13
RENSON
latexco
QUICK STEP

Clearly not a clavicular fracture

Clavicular fractures and AC dislocations

A Anatomy

B Mechanisms of injury

C **Treatment**

D Complications

E After treatment

Treatment

1. **Midclavicular fractures**
2. **AC dislocations**
3. **Lateral clavicular fractures**

Treatment

1. **Midclavicular fractures**
2. **AC dislocations**
3. **Lateral clavicular fractures**

Treatment **midclavicular fractures**

- **Conservative**

- **Operative**
  - Indications for surgery
  - Techniques

Conservative treatment

Conservative treatment

In case of overlapping fragments

Others…

Operative treatment

Classic indications:

- ❑ Skin at risk / open fracture
- ❑ Multiple fractures
- ❑ Floating shoulder
- ❑ Neurovascular compromise

Indications to operate?

Nonoperative Treatment Compared with Plate Fixation of Displaced Midshaft Clavicular Fractures.

Sahal A. Altamimi, MD, FRCS(C);
Michael D. McKee, MD, FRCS(C)

J Bone Joint Surg Am, 2008 Mar; 90

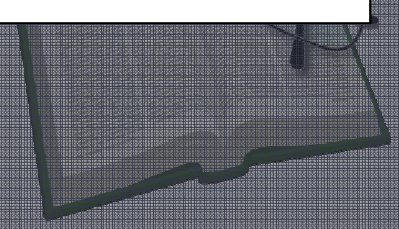
Indications to operate?

CONCLUSIONS:

Operative fixation of a displaced fracture of the clavicular shaft results in improved functional outcome and a **lower rate of malunion and nonunion** compared with nonoperative treatment at one year of follow-up.

Hardware removal remains the most common reason for repeat intervention in the operative group.

This study supports **primary plate fixation of completely displaced midshaft clavicular fractures in active adult patients.**



Indications to operate?

Operative Versus Nonoperative Treatment of Midshaft Clavicle Fractures in Adolescents.

Vander Have, Kelly L. MD;
Perdue, Aaron M. MD;
Caird, Michelle S. MD;
Farley, Frances A. MD

Indications to operate?

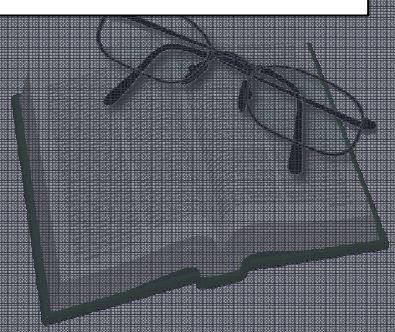
CONCLUSIONS:

Plate fixation of displaced midshaft clavicle fracture reliably restores length and alignment.

It resulted in **shorter time to union with low complication rates.**

Symptomatic malunion in adolescents may be more common than earlier thought after significantly displaced fractures.

Farley, Frances A. MD



Indications to operate?

Open reduction and plate fixation versus nonoperative treatment for displaced midshaft clavicular fractures: a multicenter, randomized, controlled trial.

Robinson CM1

J Bone Joint Surg Am. 2013 Sep 4;95(17):1576-84.
doi: 10.2106/JBJS.L.00307.

CONCLUSIONS:

Open reduction and plate fixation reduces the rate of nonunion after acute displaced midshaft clavicular fracture compared with nonoperative treatment and is associated with better functional outcomes.

However, the improved outcomes appear to result from the prevention of nonunion by open reduction and plate fixation.

Open reduction and plate fixation is **more expensive and is associated with implant-related complications** that are not seen in association with nonoperative treatment.

The results of the present study **do not support routine primary open reduction and plate fixation** for the treatment of displaced midshaft clavicular fractures.

Operative treatment

Extended indications:

- Special considerations
  - Job related
  - Sports related
- Need for fast rehab
- "On demand“ surgery

Operative treatment

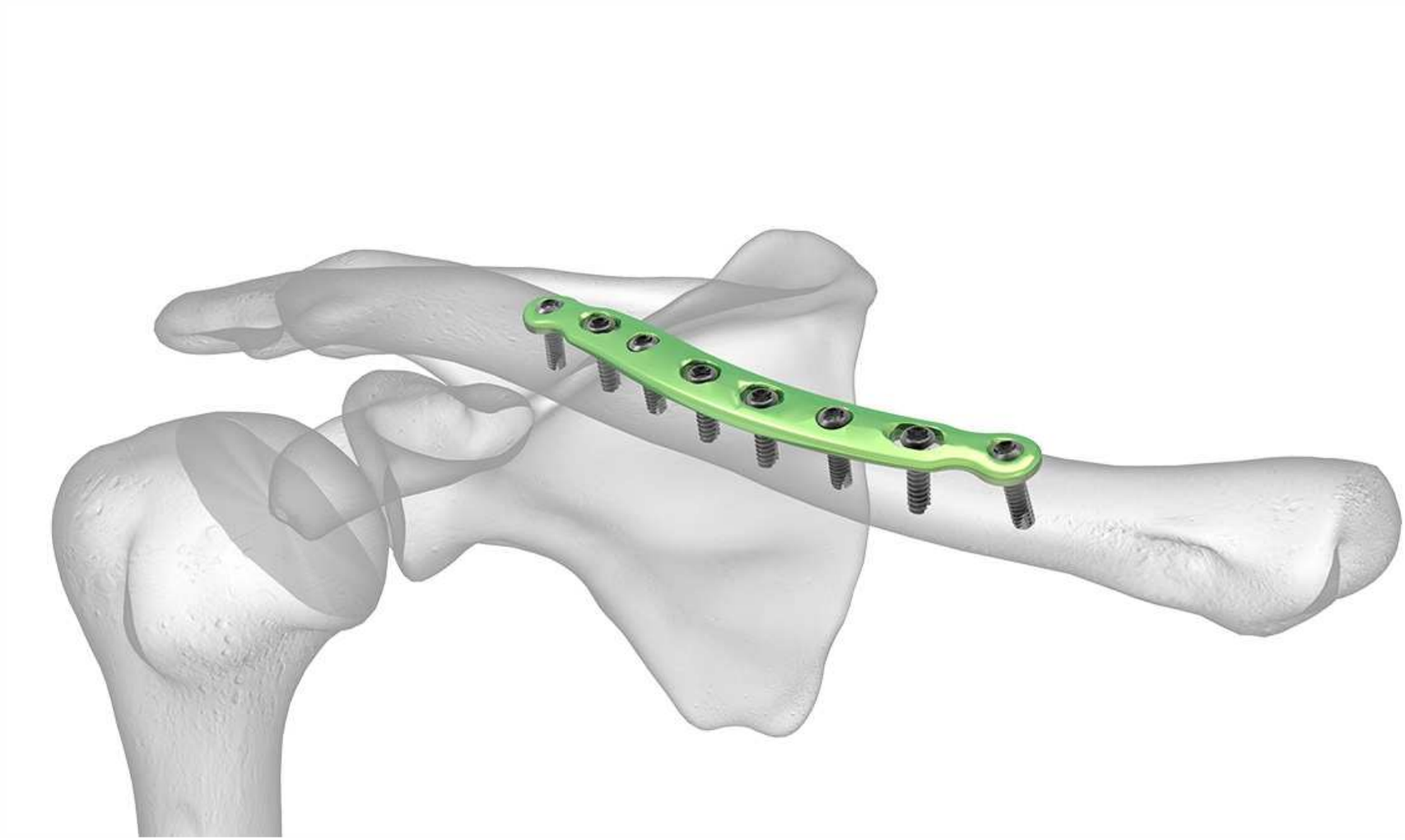
Techniques:

1. **Intramedulary rod**
2. **Clavicular plating**

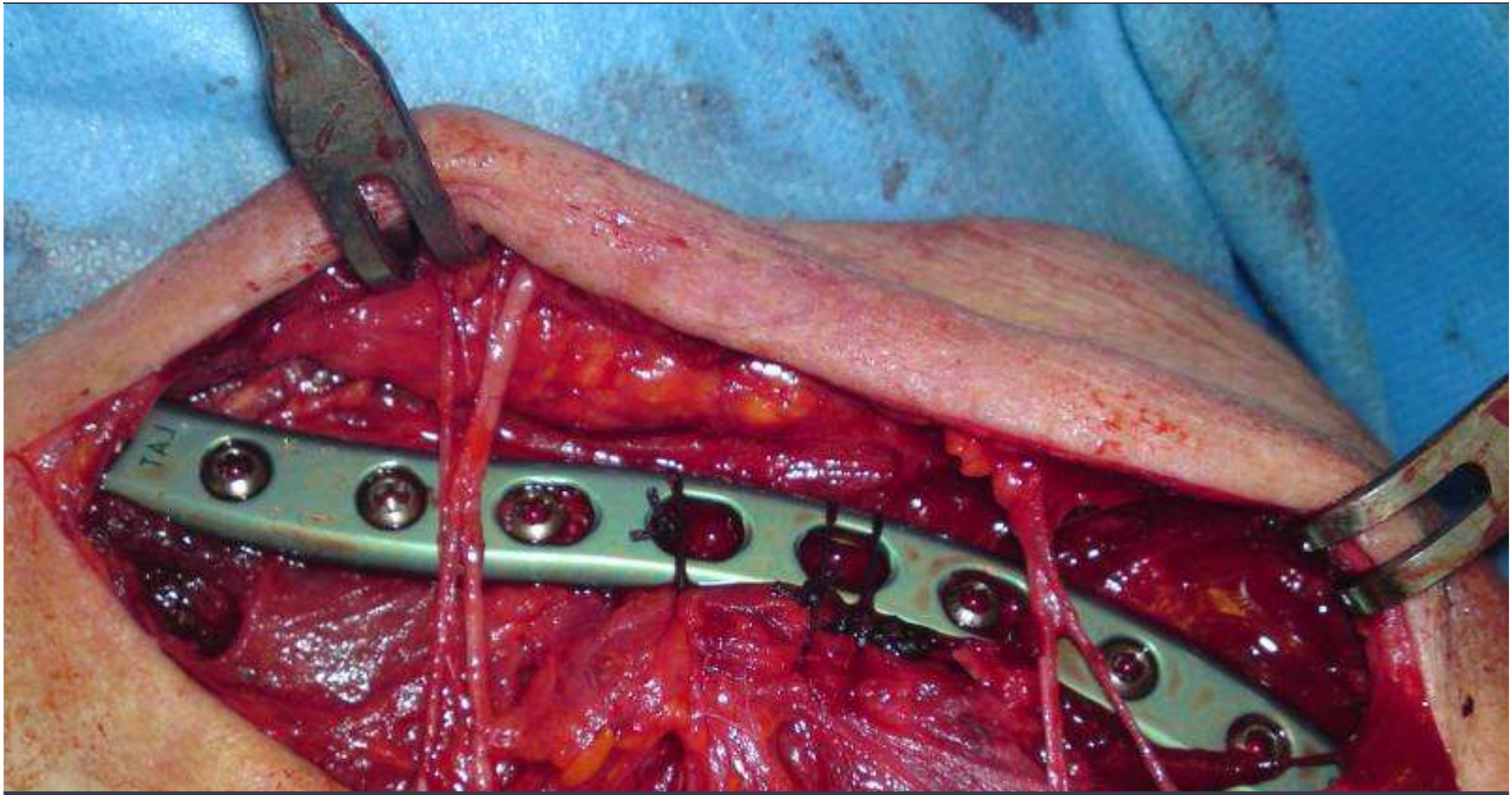
Intramedulary rod

Intramedulary rod

Clavicular plating

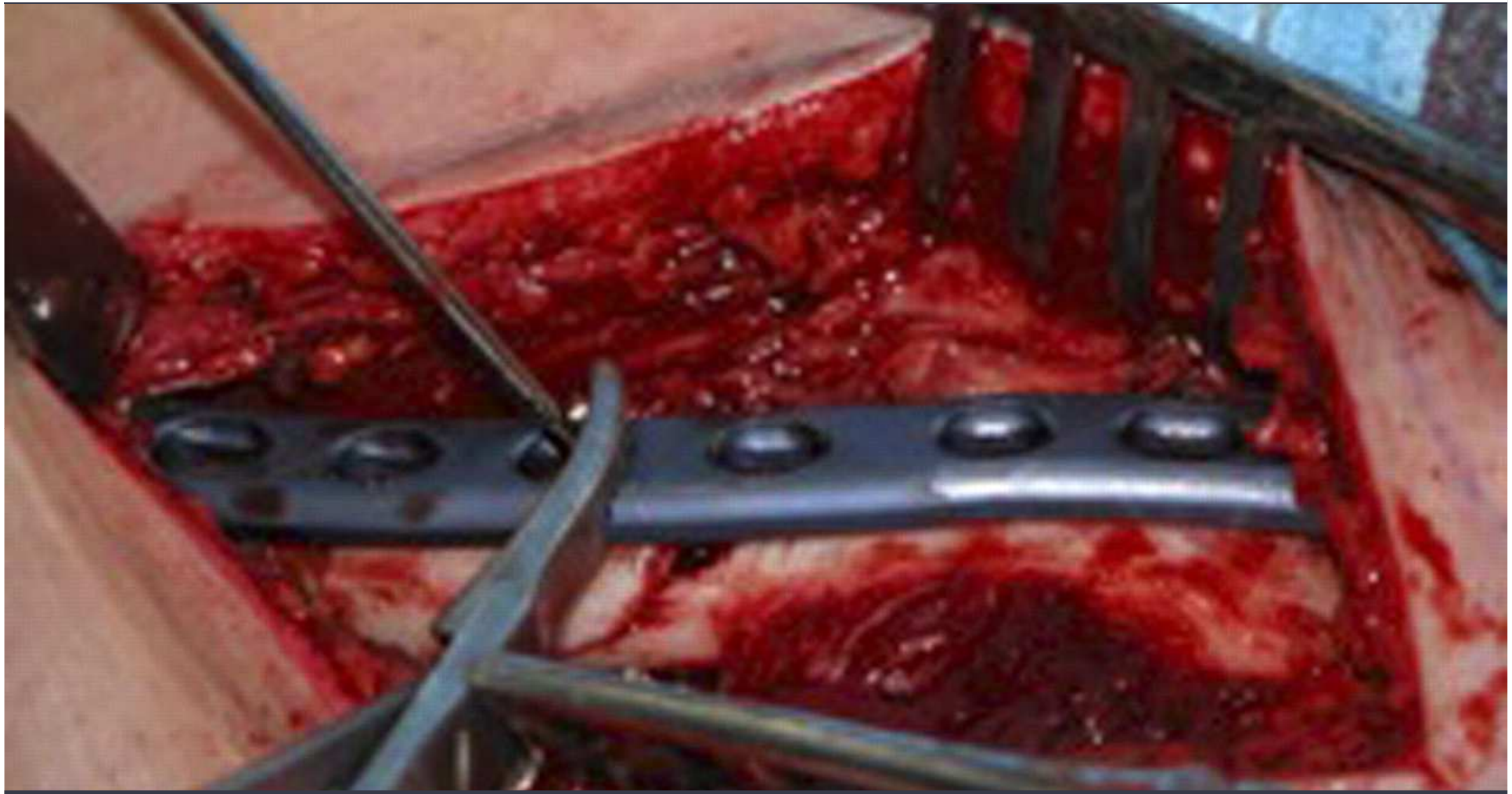


Clavicular plating



exposure

Clavicular plating

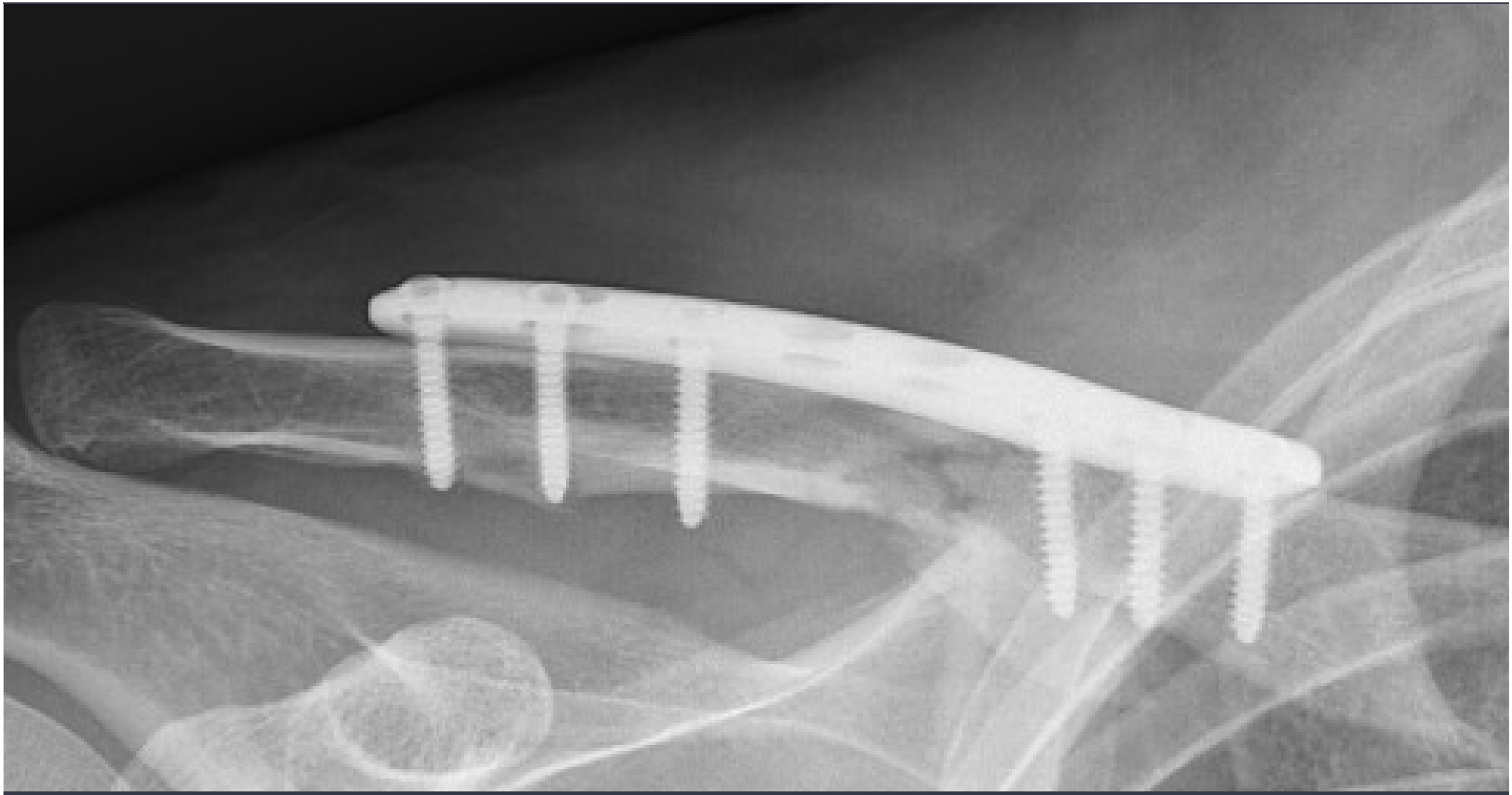


reduction fracture fragments

Clavicular plating

reduction fracture fragments

Clavicular plating



reduction fracture fragments

Clavicular plating

reduction fracture fragments

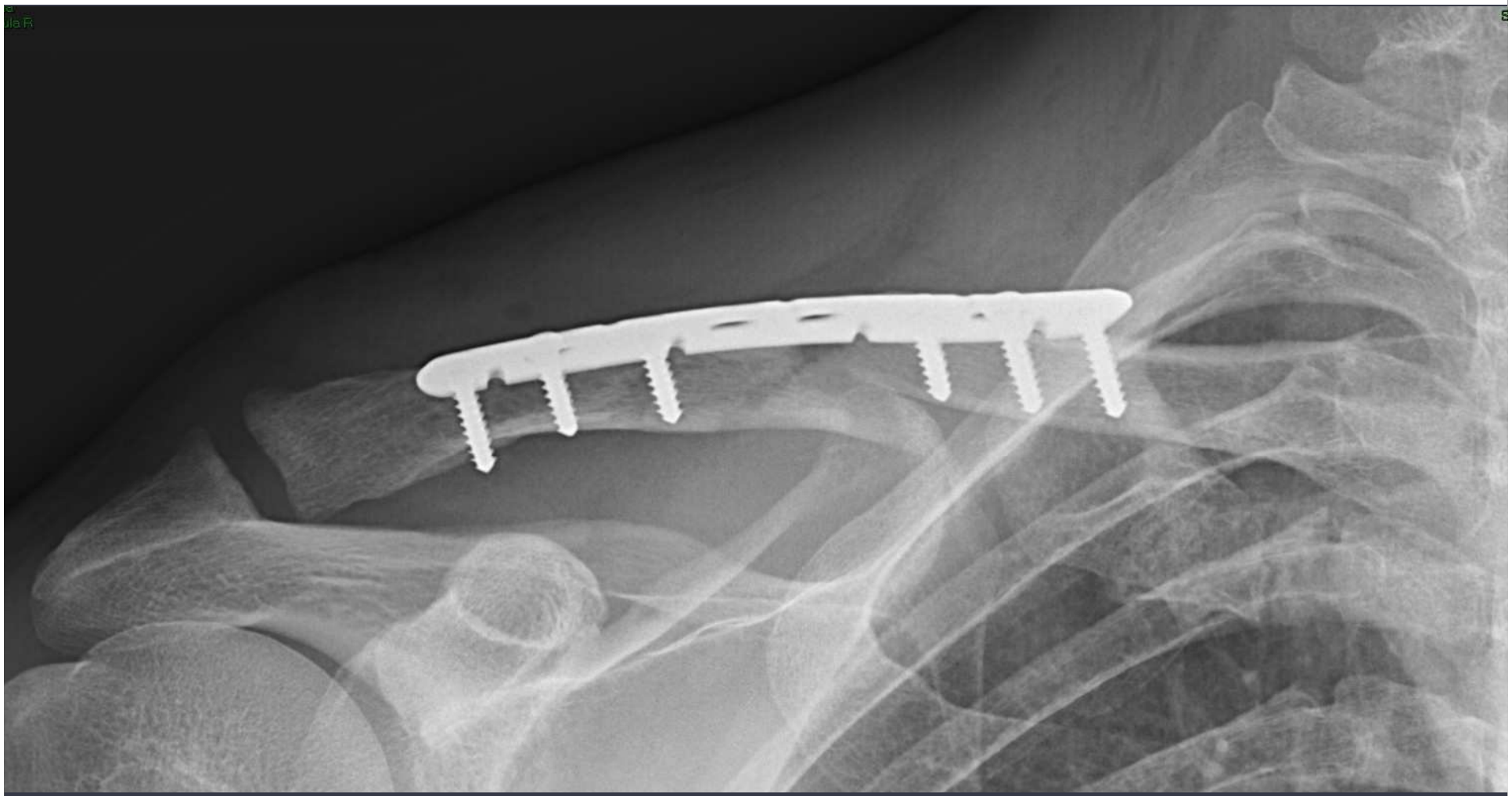
Clavicular plating

reduction fracture fragments

Clavicular plating

bridging plate

Clavicular plating



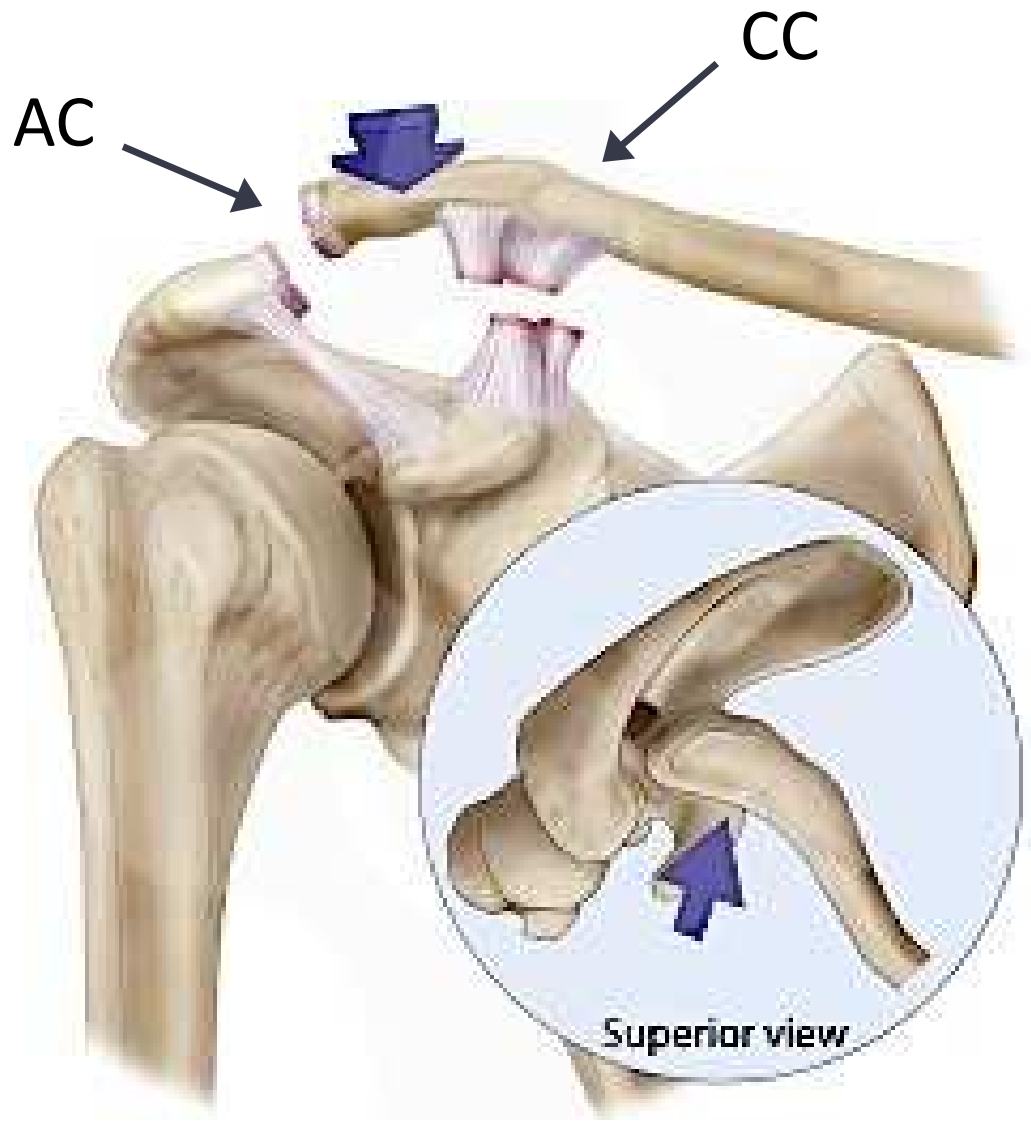
bridging plate

Treatment

1. Midclavicular fractures
2. **AC dislocations**
3. Lateral clavicular fractures

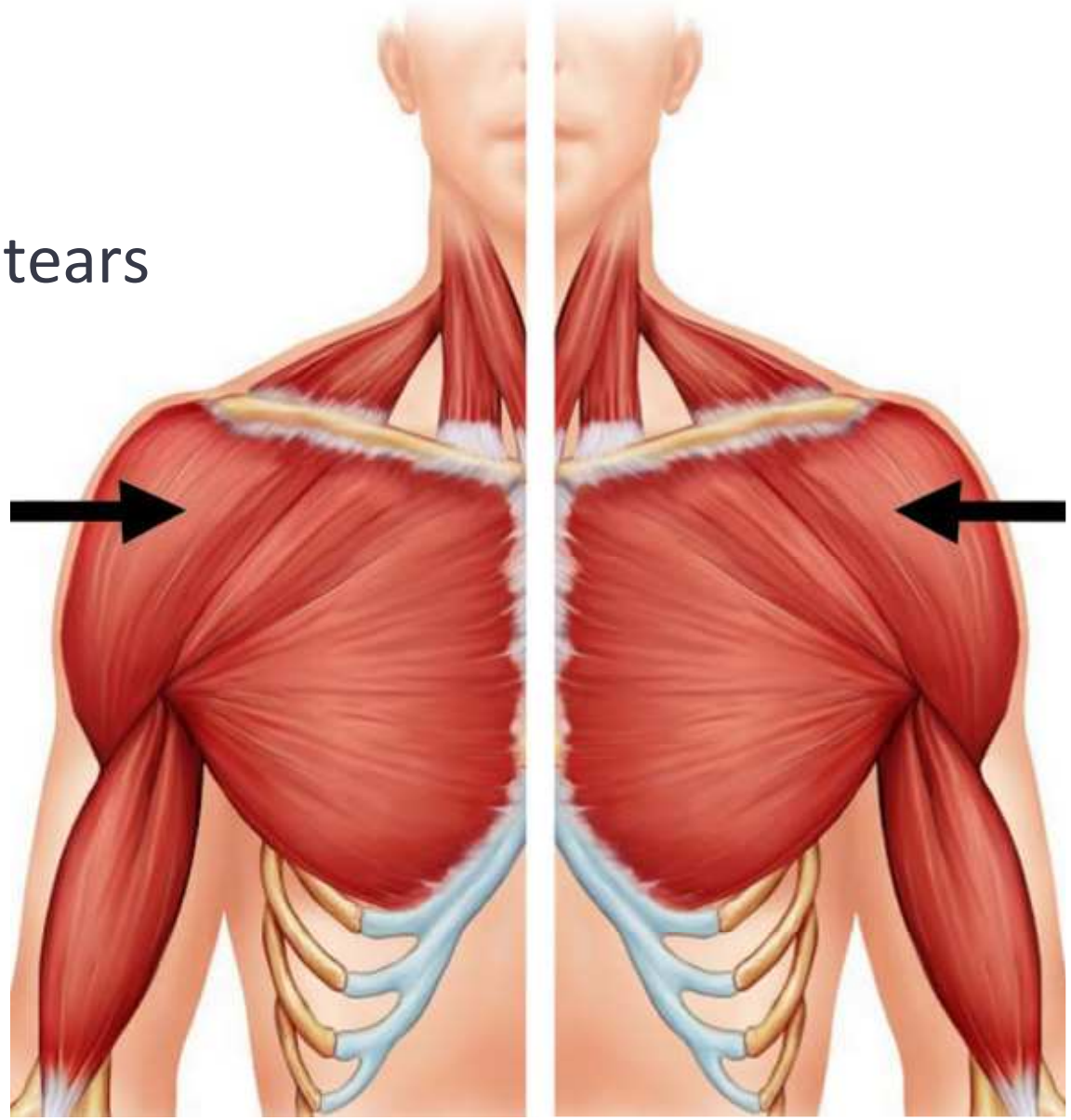
Types of AC dislocation

1. Ligament tears



Types of AC dislocation

1. Ligament tears
2. Muscular fascia tears

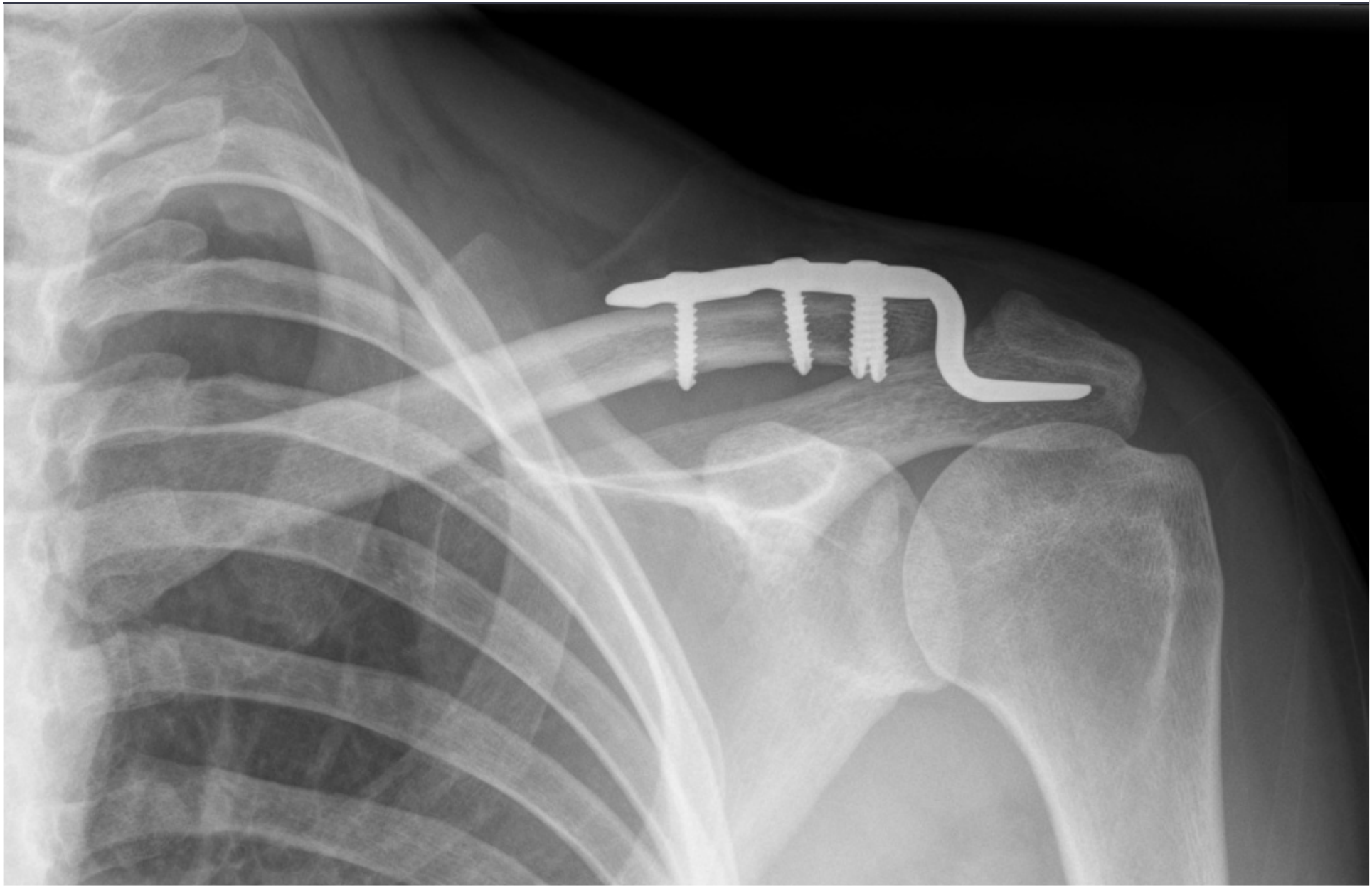


Reconstruction AC dislocation

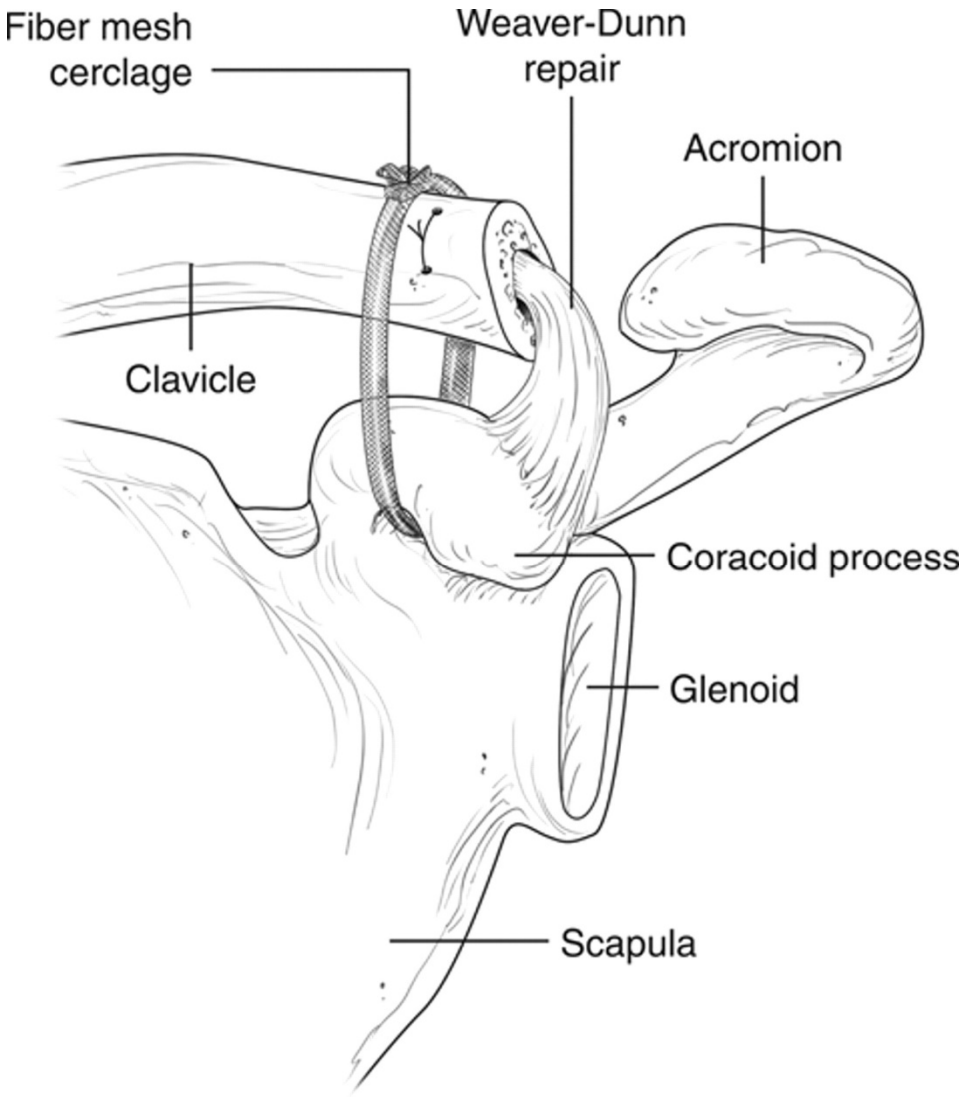
Techniques:

1. **Hook plate**
2. **Modified “Weaver – Dunn”**
3. **Sling around coracoid**
4. **Anatomic augmentation CC ligaments**

Hook plate

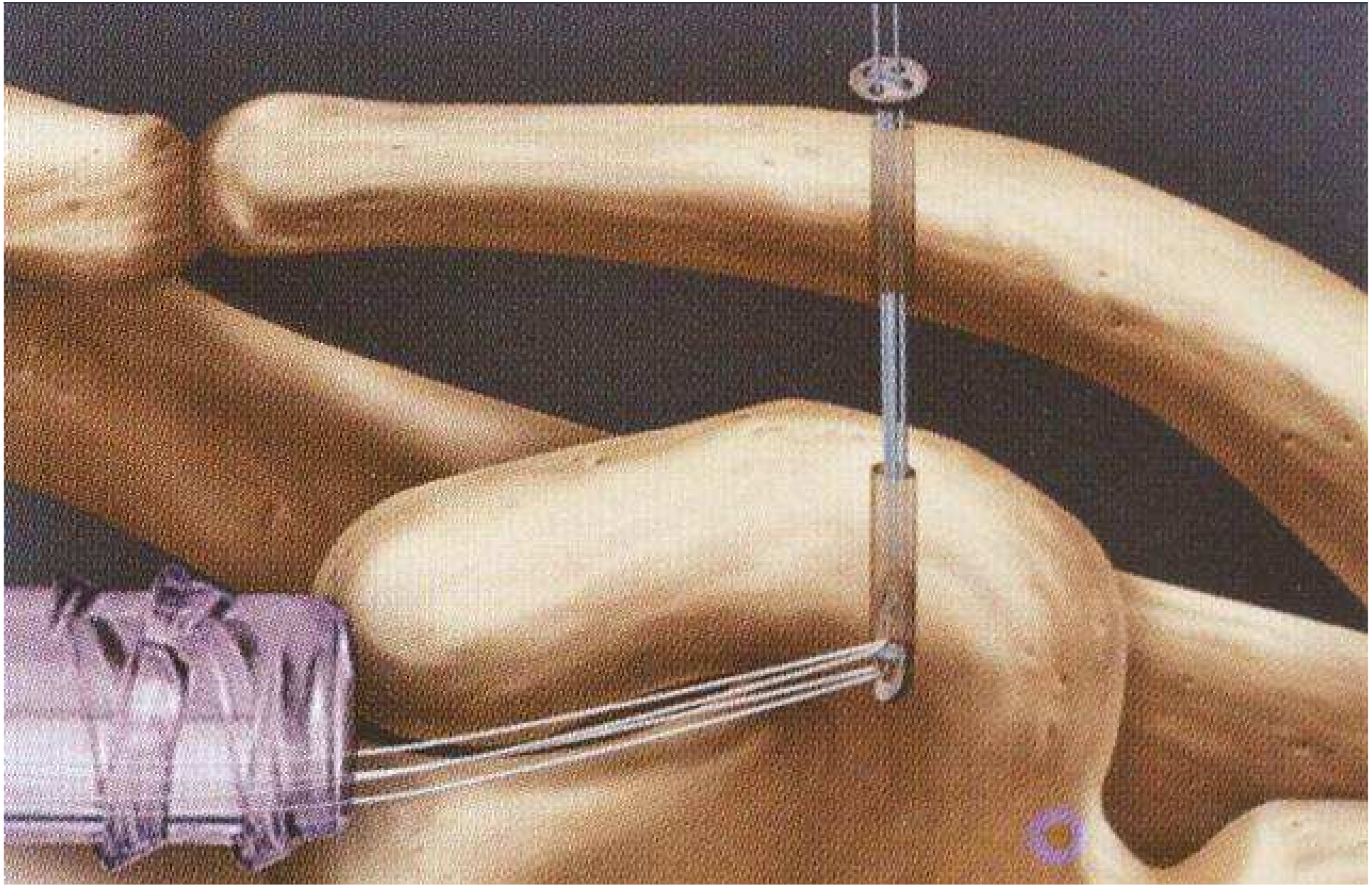


Modified “Weaver – Dunn”

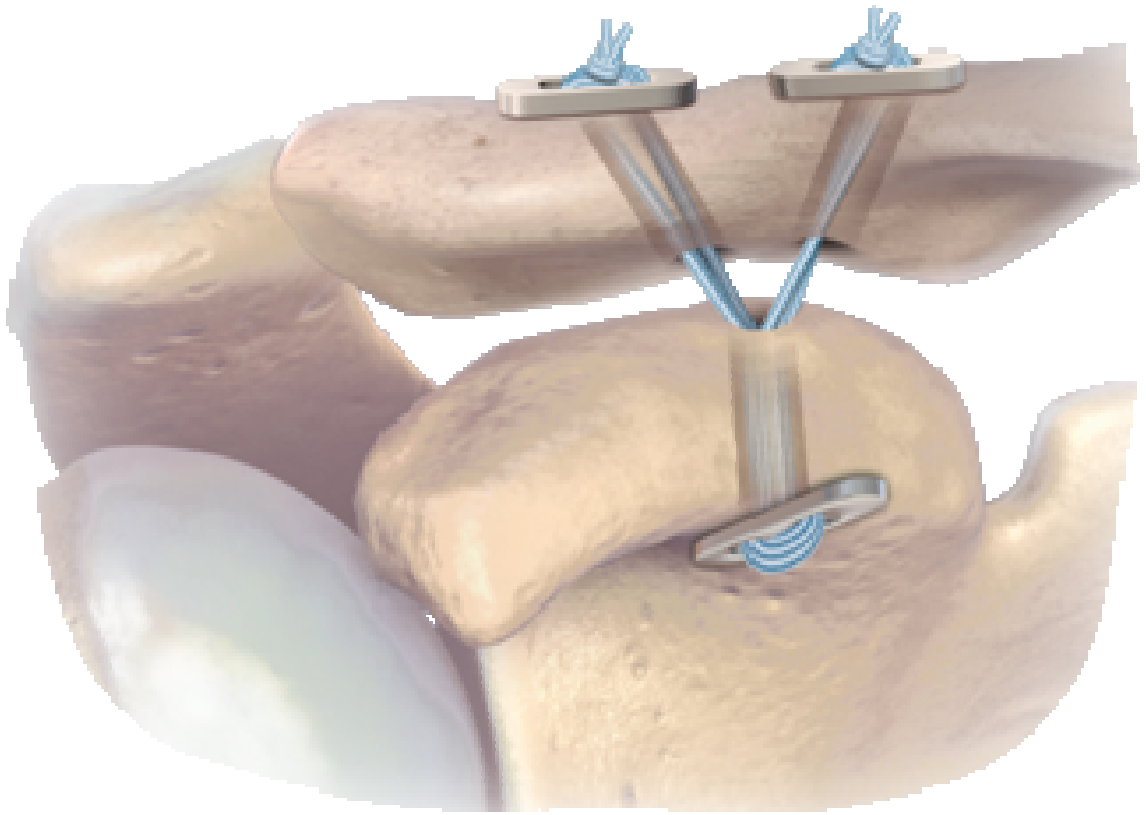


“Sling augmentation”

Arthroscopic ?



Anatomic augmentation CC

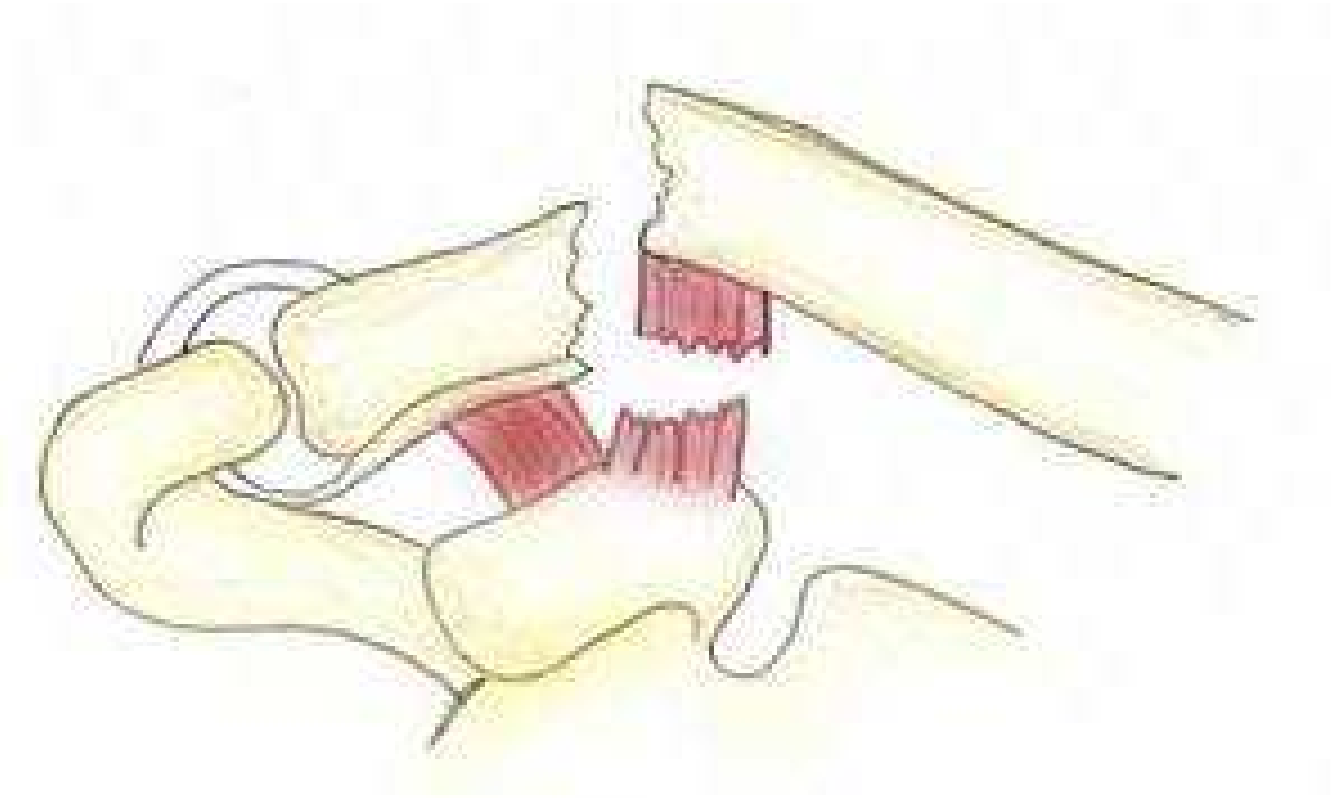


Treatment

1. Midclavicular fractures
2. AC dislocations
3. **Lateral clavicular fractures**

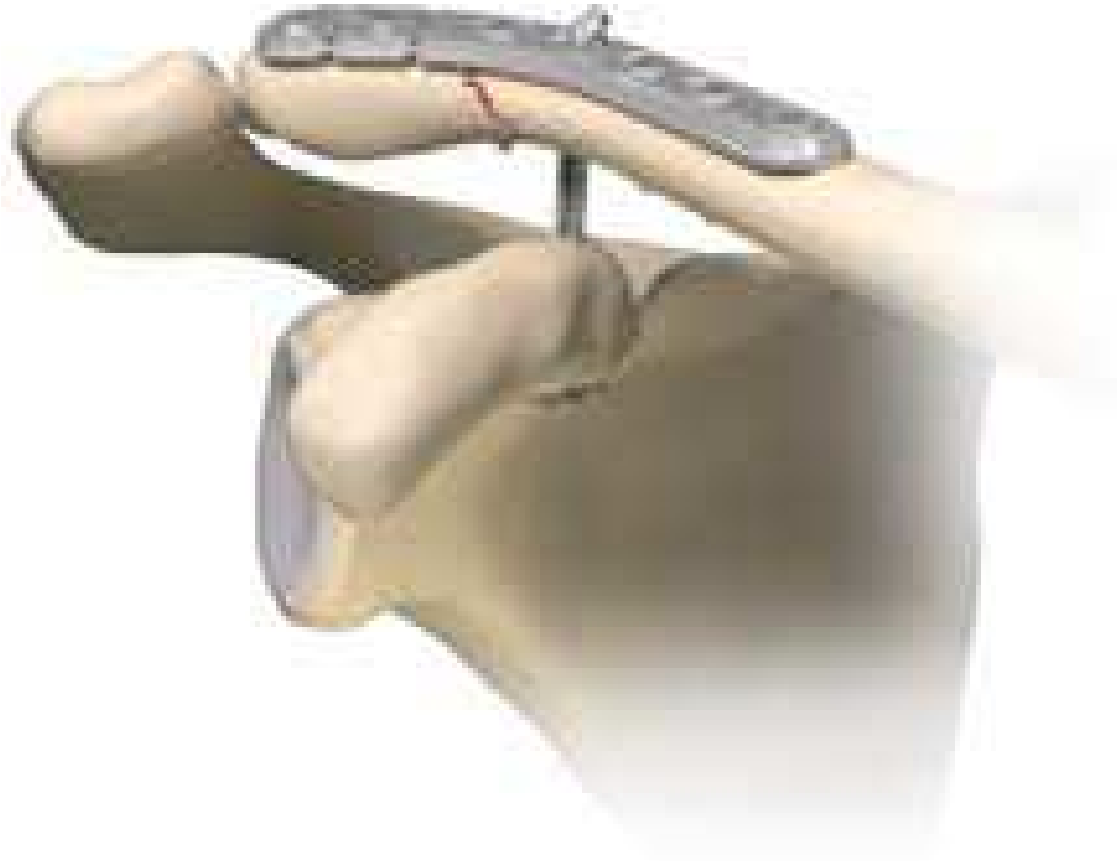
Types of lateral clavicular fractures

1. No disruption of CC ligaments
2. With disruption of CC ligaments



Types of lateral clavicular fractures

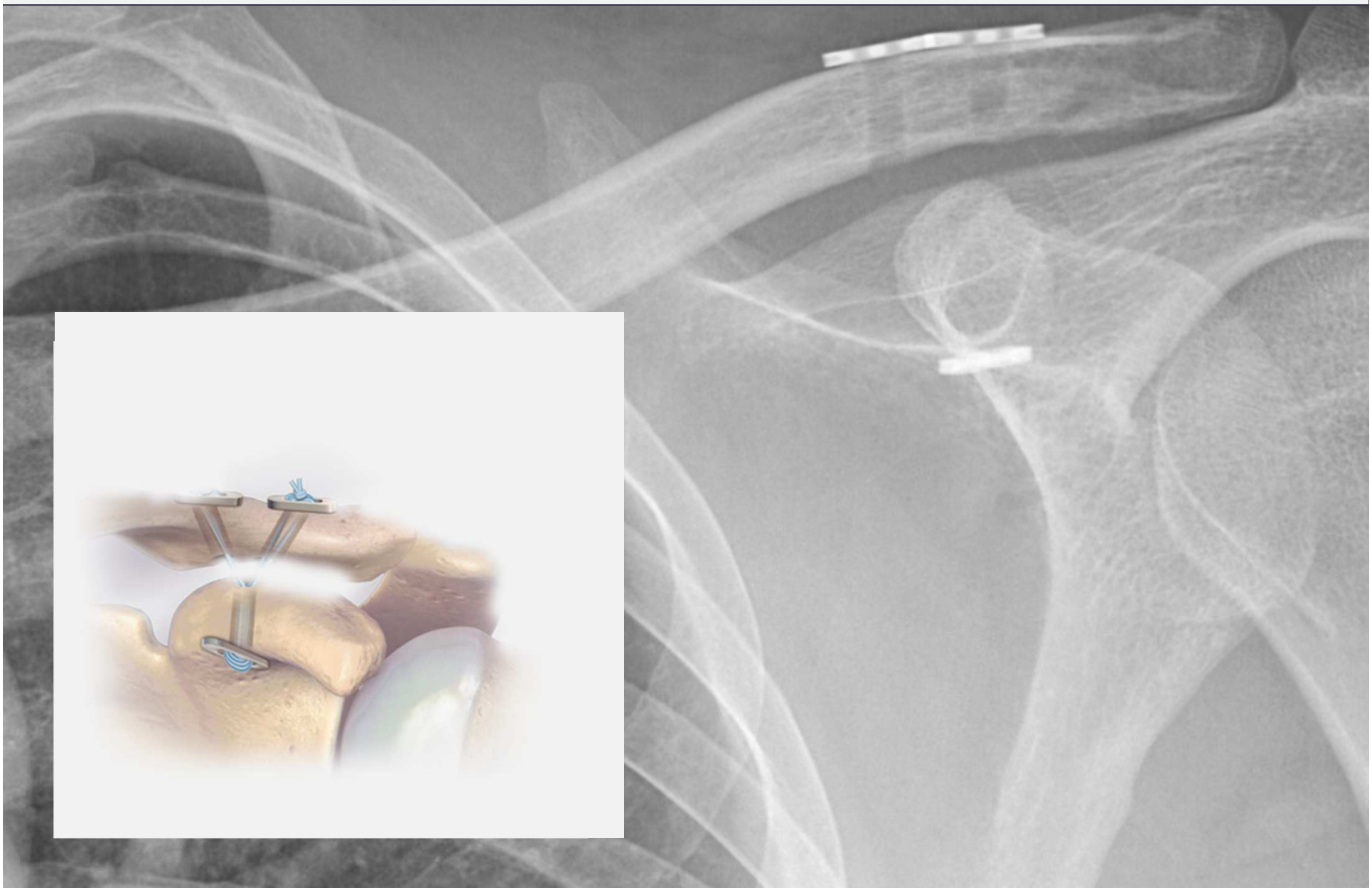
Operative treatment



Operative treatment

Operative treatment

Operative treatment



Clavicular fractures and AC dislocations

A Anatomy

B Mechanisms of injury

C Treatment

D **Complications**

E After treatment

Complications

In general:

- Wound problems
- Infection
- Neurovascular lesions
- Pneumothorax

Complications

Clavicula fractures:

- Refracture besides the plate
- Pseudarthrosis malunion
- Plate failure

AC reconstruction:

- Failure fixation
  - Acute
  - Chronic

Complications

Clavicula fractures:

- Refracture besides the plate
- Pseudarthrosis malunion
- Plate failure

AC reconstruction:

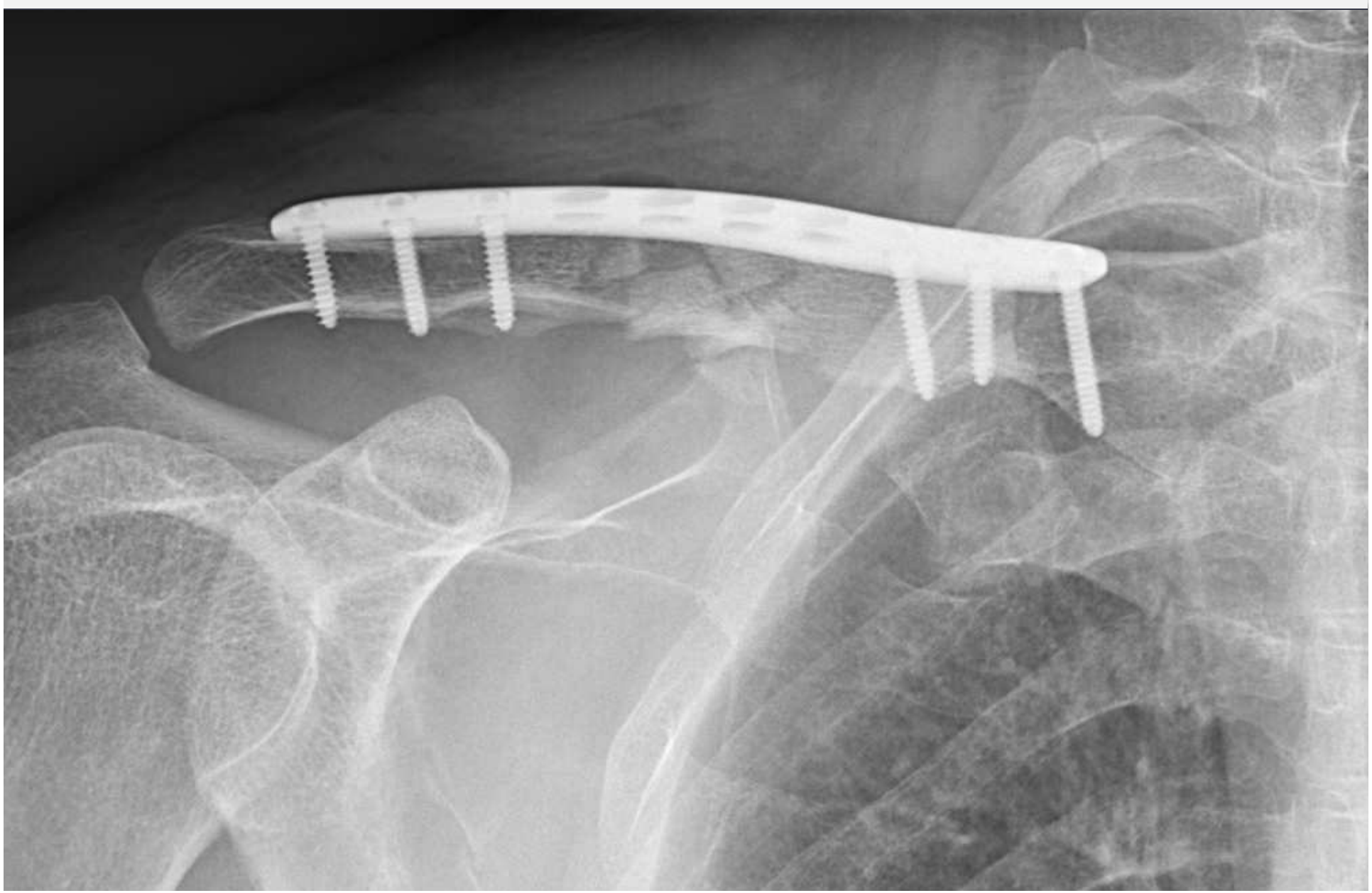
- Failure fixation
  - Acute
  - Chronic

Refracture

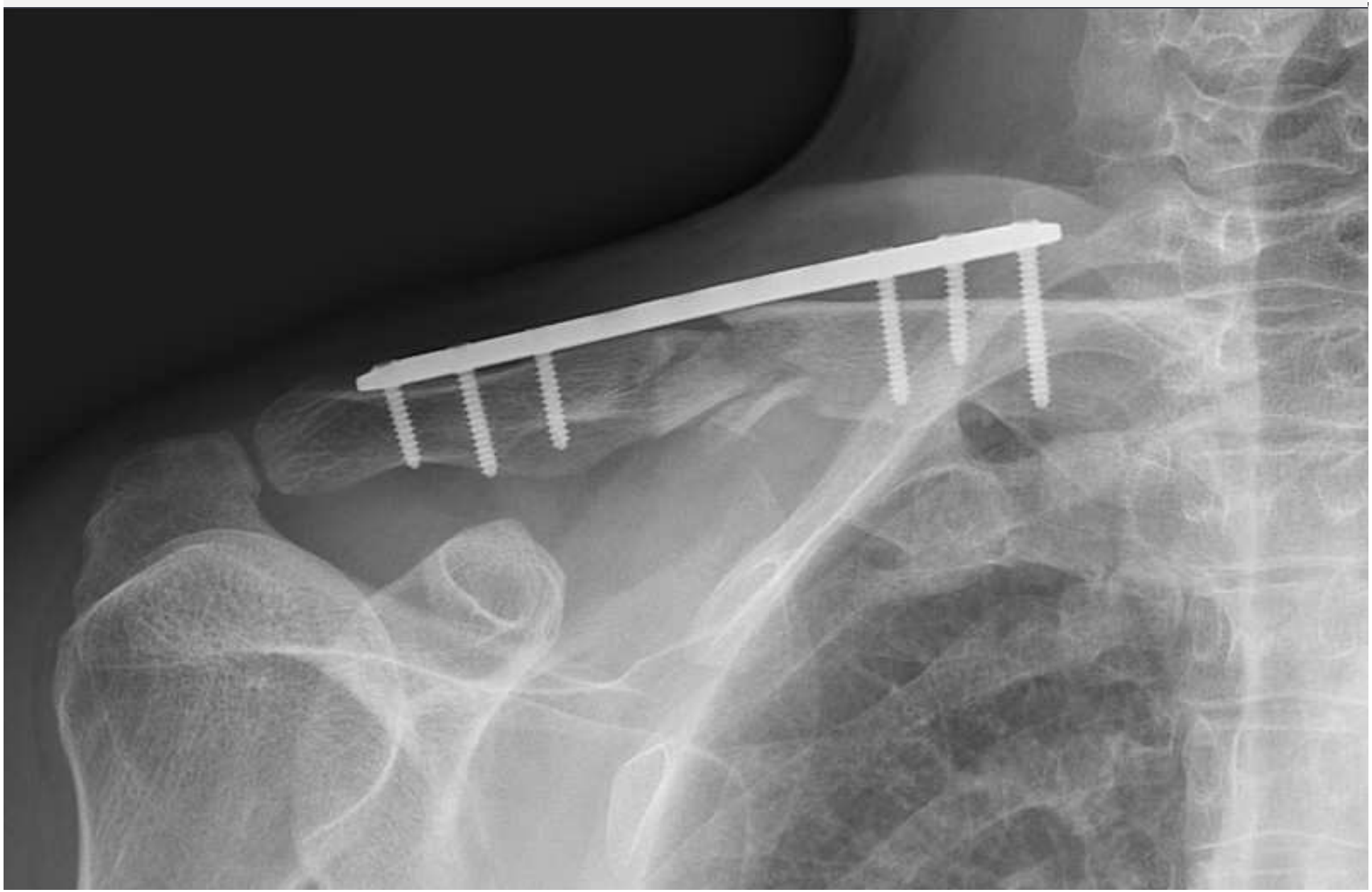
Refracture

Malunion / plate failure

Malunion / plate failure



Malunion / plate failure



Hardware failure

Hardware failure

Hardware failure

Complications

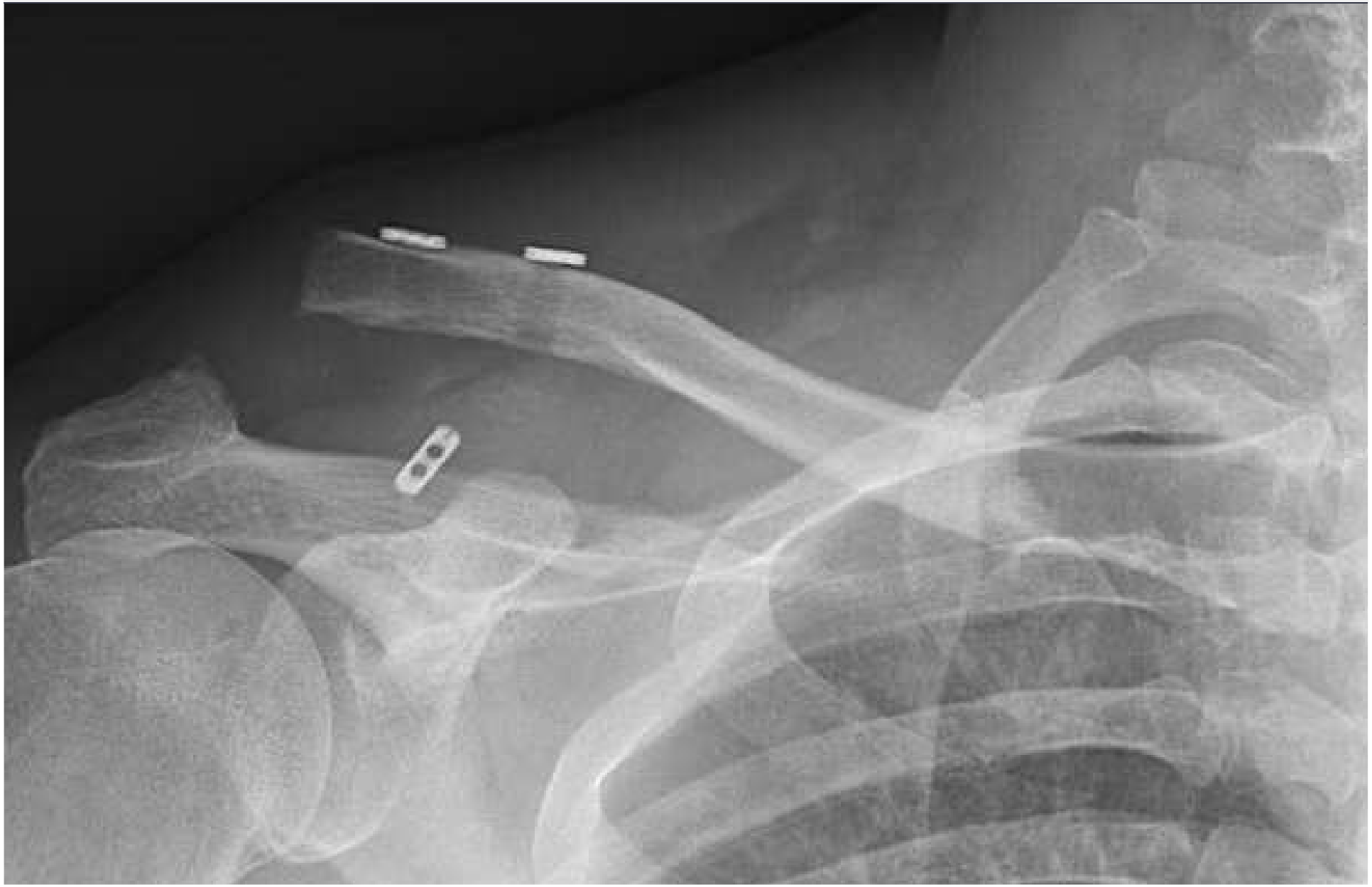
Clavicula fractures:

- Refracture besides the plate
- Pseudarthrosis malunion
- Plate failure

AC reconstruction:

- Failure fixation
  - Acute
  - Chronic

Acute failure fixation system



Chronic failure fixation system

Chronic failure fixation system

Chronic failure fixation system

Clavicular fractures and AC dislocations

A Anatomy

B Mechanisms of injury

C Treatment

D Complications

E **After treatment**

Rehabilitation **in general**

- Fast
- Do better than conservative
- No downword forces 6 weeks
- Immediate passive shoulder motion

Rehabilitation **acute clavicula / AC**

- Few days sling
- Wound healing (sweat)
- Steady bike 1 week
- “On the road” 2-3 weeks

Rehabilitation **complex clavicula / chronic AC**

- 4-6 weeks sling
- Only sports with arm support (bike!)
- No pull on the handle bar (sprint, climb)

almost there

conclusions

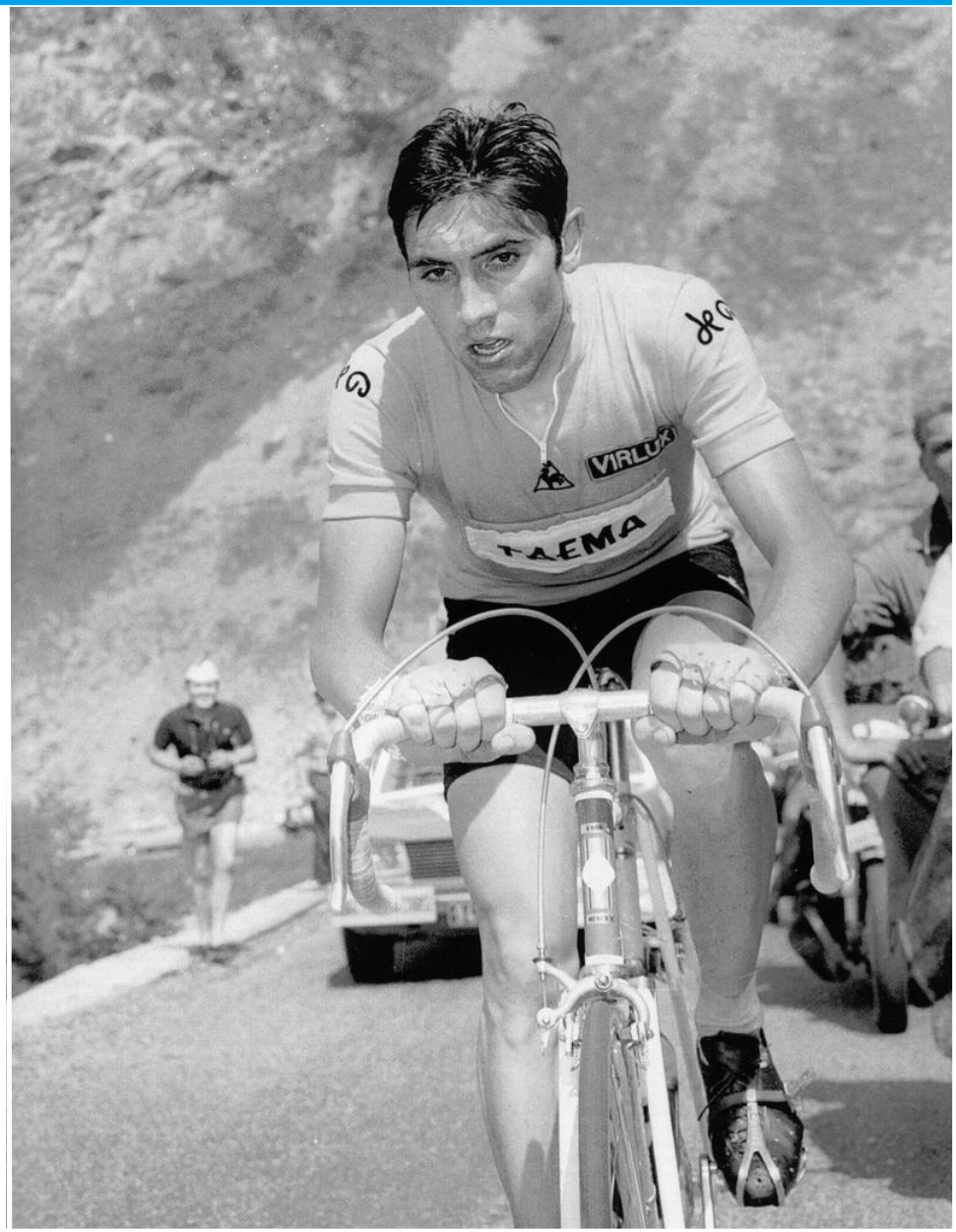
Conclusions

No. 1 hit in cyclist

Conclusions

- Clavicular fractures
  – AC dislocation

- Lesions “on the move”



Conclusions

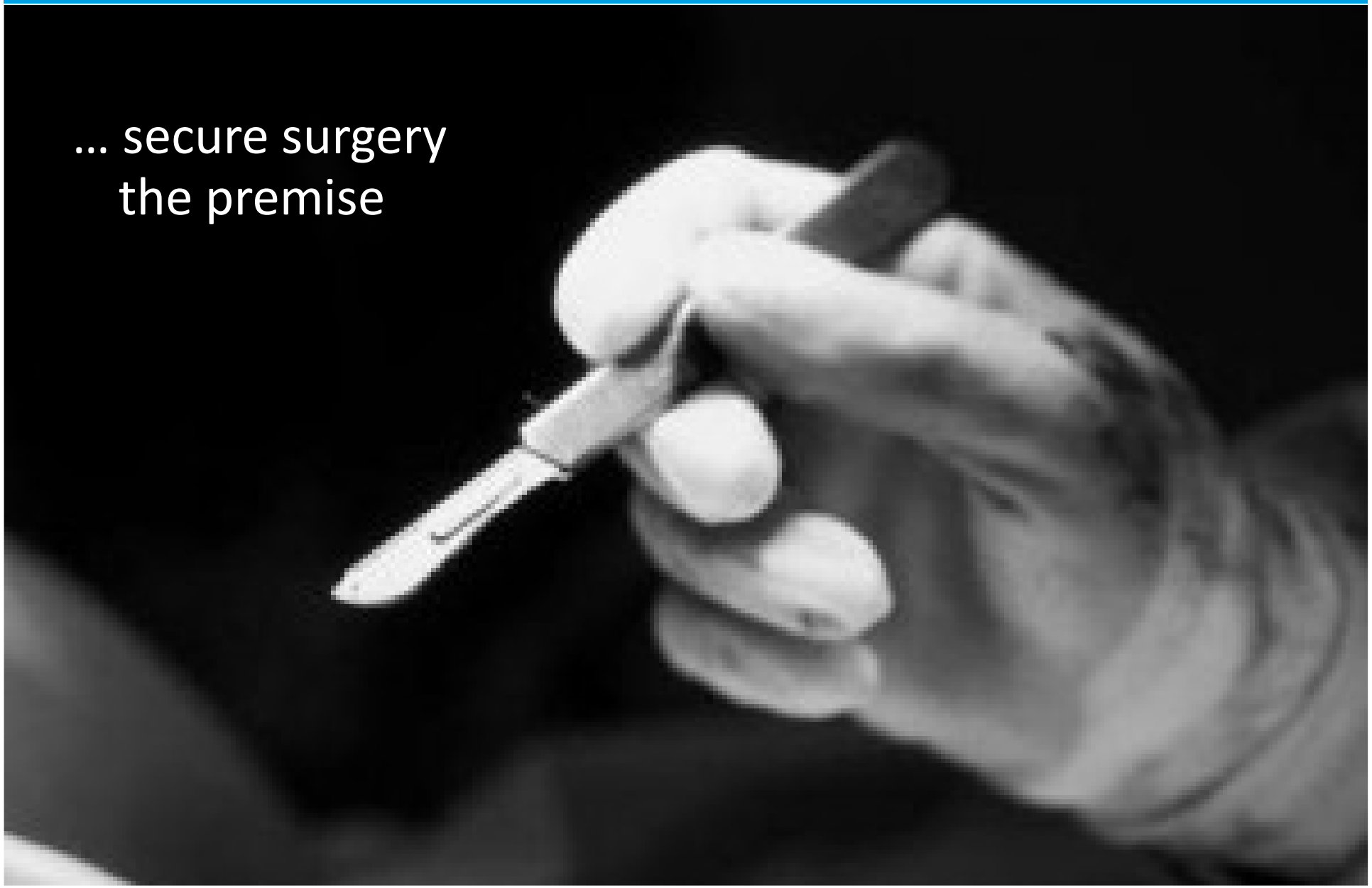
- Indication is the start
- High demand population
  - Cyclists
  - Team boss
- Complex decisions

Conclusions

Solid fixation
is the key…

Conclusions

… secure surgery
the premise



Conclusions

Thanks