Dr Todd Gothelf

www.orthosports.com.au

47-49 Burwood Road, Concord

29-31 Dora Street, Hurstville

119-121 Lethbridge Street, Penrith

ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

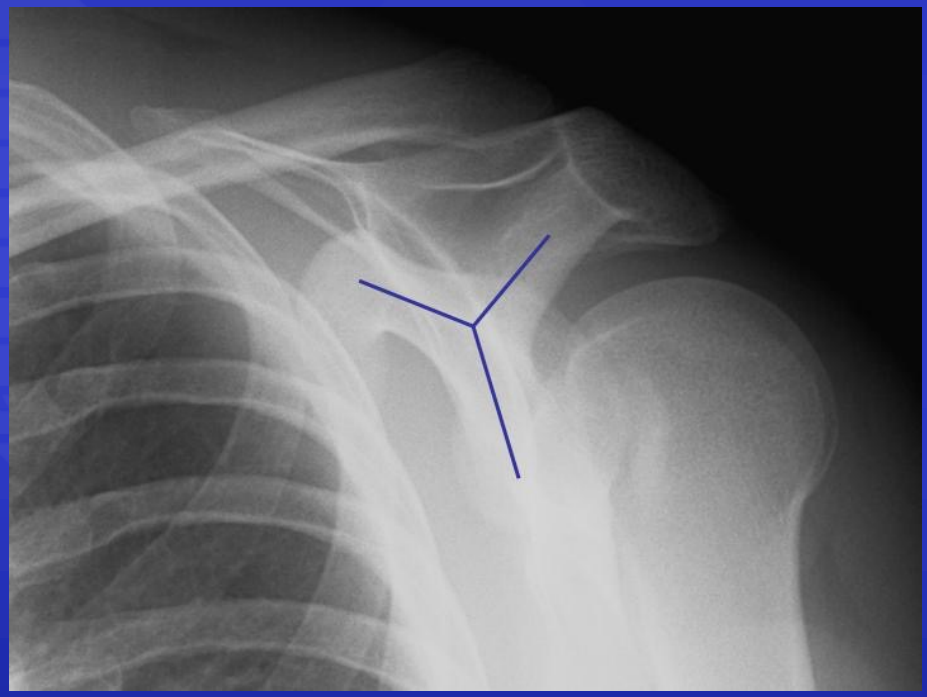
Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Shoulder Instability: Benefits of Remplissage

ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

- Most frequently dislocated joint- affects between 2% and 8% of the population
- Represents one third of all shoulder related visits to the emergency room



ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Shohei Ohtani

- Japanese baseball player for LA Dodgers
- Rare hitter and pitcher
- Compared to Babe Ruth, last player to hit and pitch
- Transformed attention to baseball in Japan
- 13% of Japanese population watched World Series
- FINALLY a WORLD Series

Shohei Ohtani

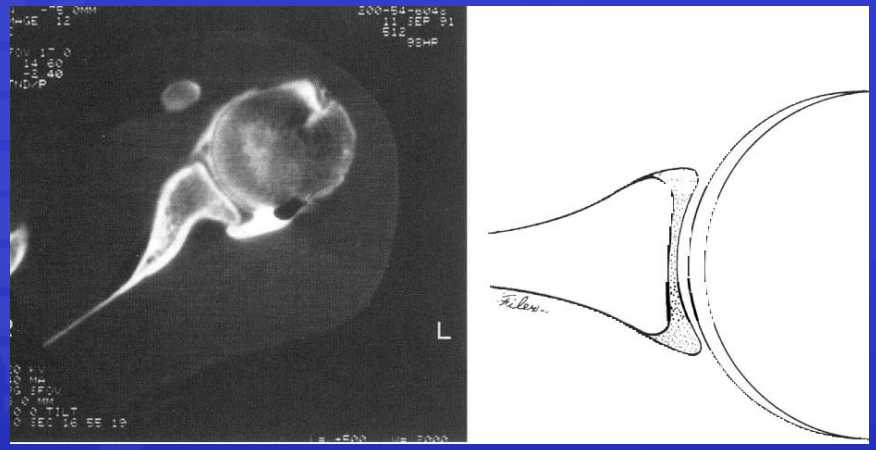
- Game 2 of World Series
- Dislocated/subluxated left shoulder
- Went on to play to help Dodgers win Work Series against the Yankees

ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Shoulder Anatomy

- Humeral Head much larger than glenoid
  - Allows great ROM
  - Inherently unstable
- Labrum
  - Enlarges contact area
  - Conforms
  - Negative pressure suction

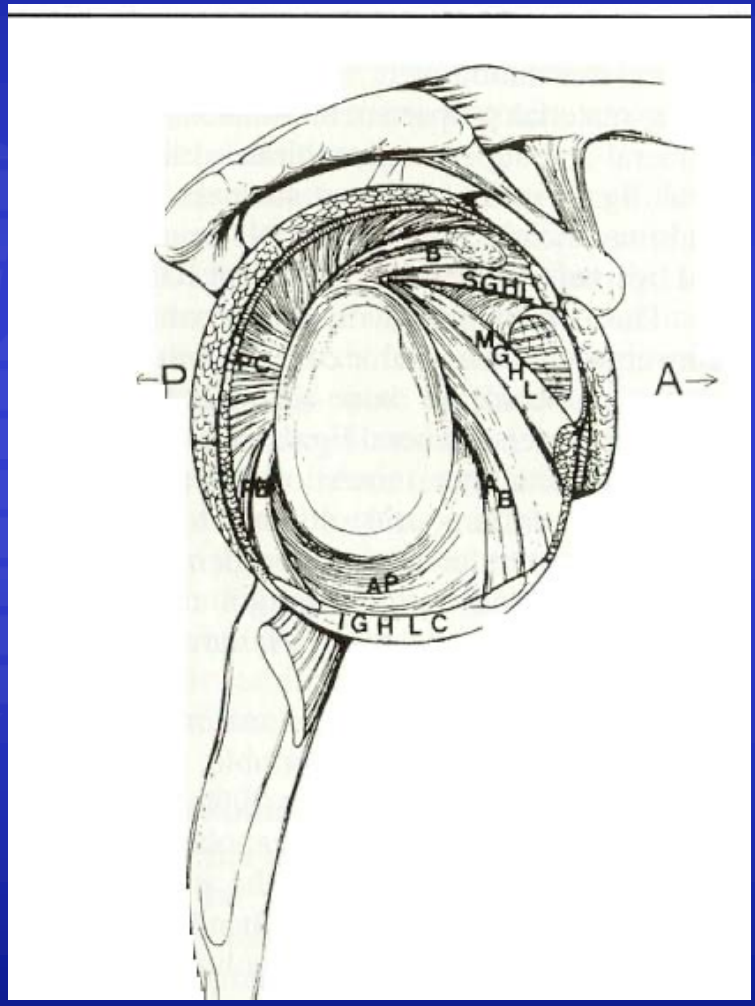


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Glenohumeral ligaments

- The labrum and ligaments deepen the socket
- Anterior inferior ligament is key restraint to anterior dislocations

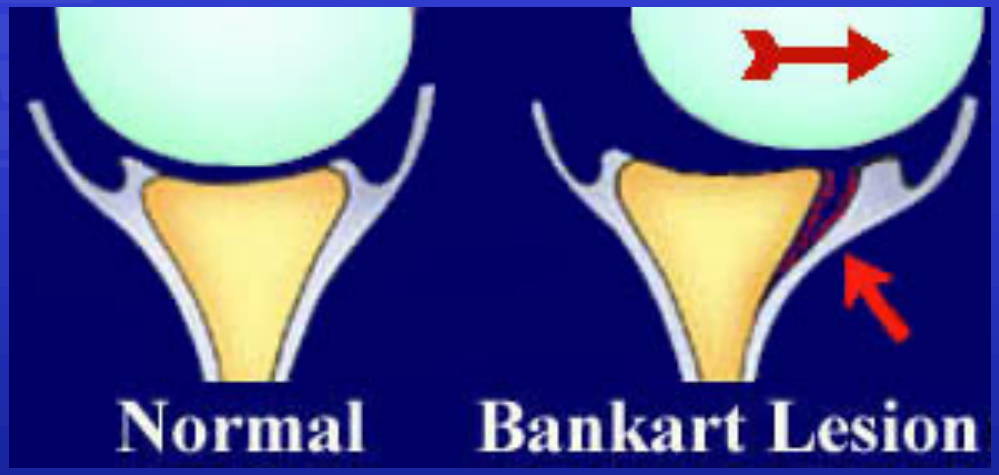


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Anterior dislocation

- Anterior force
- Anterior labral tear
- Bone loss/fracture
- Permanent changes
- Don’t heal
- Lead to recurrent dislocations.
- Further bone loss

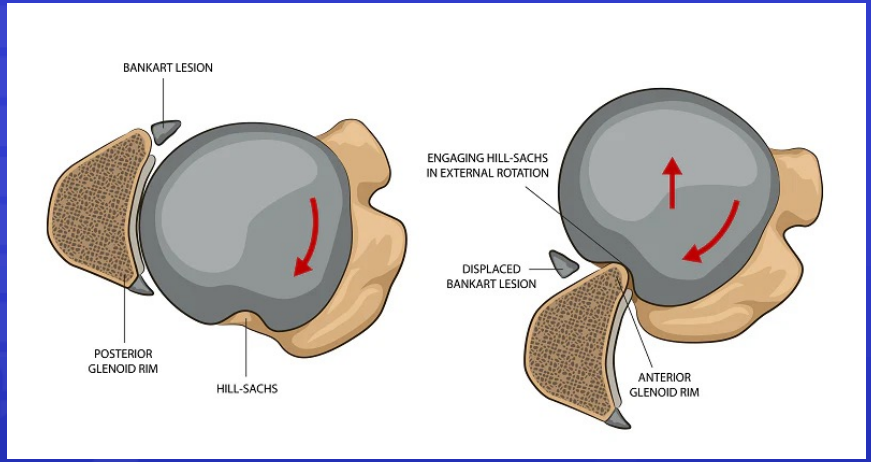


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Bipolar lesions

- Anterior injury includes:
  - Labrum
  - Bone (bankart lesion)
- Plus or minus damage to posterior humeral head.
  - Compression fracture
  - Hill Sachs Defect



ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Pathoanatomy – Hill Sachs Lesion

- Occurs in 80% of dislocations & 20% of subluxations
- Size of the defect can vary
- Causes increased risk of recurrence
- With external rotation the defect can engage and result in recurrent dislocation

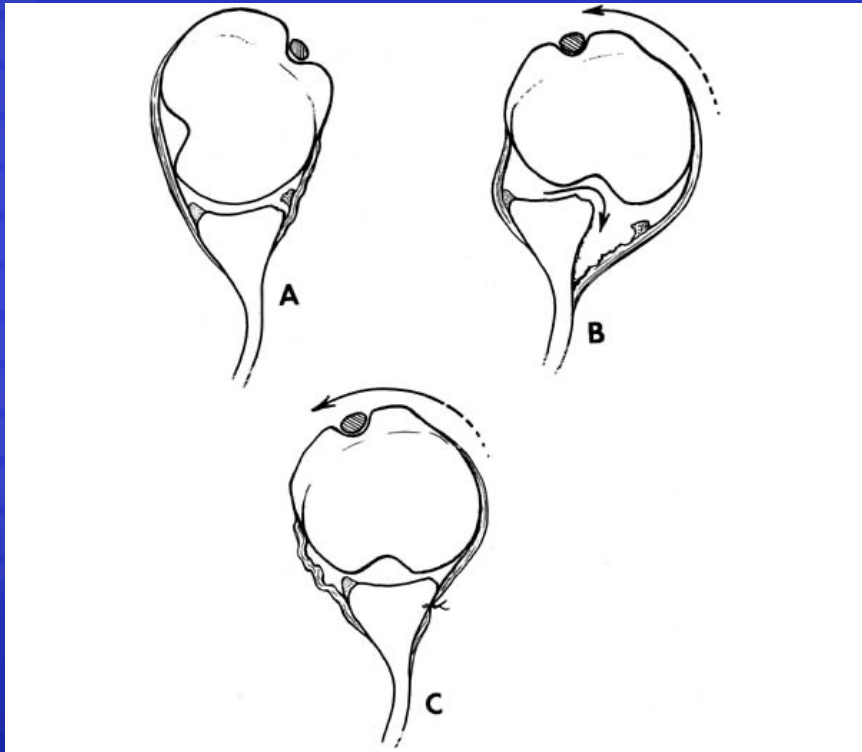


FIG. 12. Role of the Hill-Sachs lesion in anterior shoulder instability.

ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Risk of recurrence
Natural History

- Risk of recurrence 70-90% in individuals under 20 years old
- 40-60% in individuals 20-40.
- Due to permanent changes:
  - Labral tear
  - Capsular stretch
  - Bone loss
  - Hill sachs lesion

Cofield (Am J Sports Med 1984 12;19)

- 66% under 20
- 40% 20 to 40
- None older than 40

Rowe (JBJS 1956 38A)

- 83% under 20
- 63% 20 to 40
- 16% older than 40

Treatment of Acute dislocations

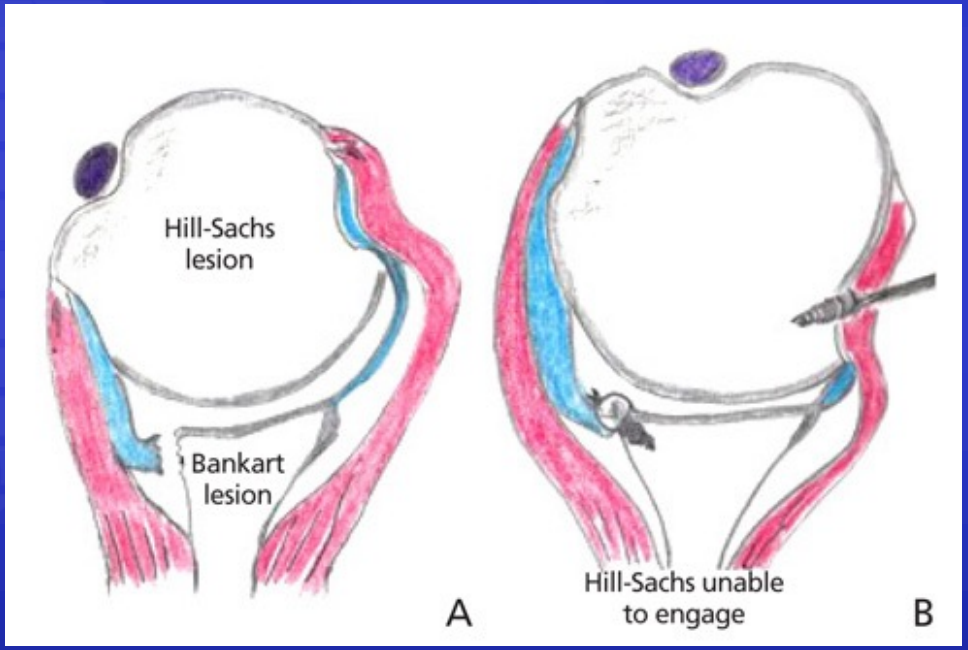
- Depends on age and activity level
- Counsel on risk of recurrence
- Surgery is reasonable
  - Reduce recurrence from 90% to 10-15%
  - Further dislocations lead to more bone loss
  - Reduce the risk of arthritis from further dislocations

ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

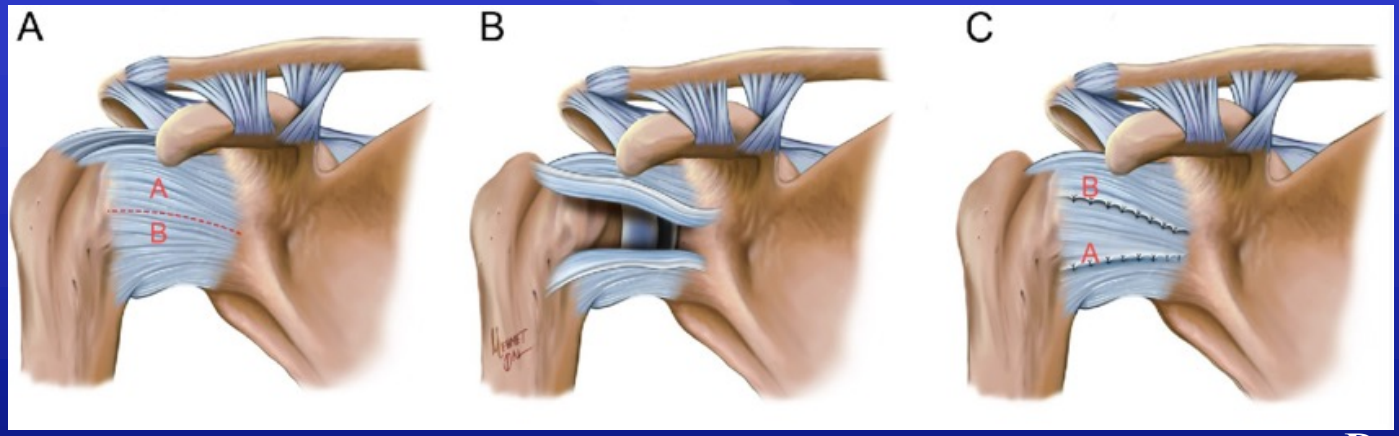
Surgical Goals

- Need to address pathology
  - Stretched anterior capsule
  - Anterior labral tear (bankart lesion)
  - Glenoid Bone loss
  - Hill Sach's lesion



Historical Treatment

- X-rays only, no MRI, no arthroscopy, relied on clinical examination
- Gold Standard, Open capsular shift
- Tightened anterior capsule
- Addressed the hill sachs or bone loss indirectly
- Intended loss of external rotation does not allow for dislocation.
- Was fairly successful (5-15% recurrence rates)

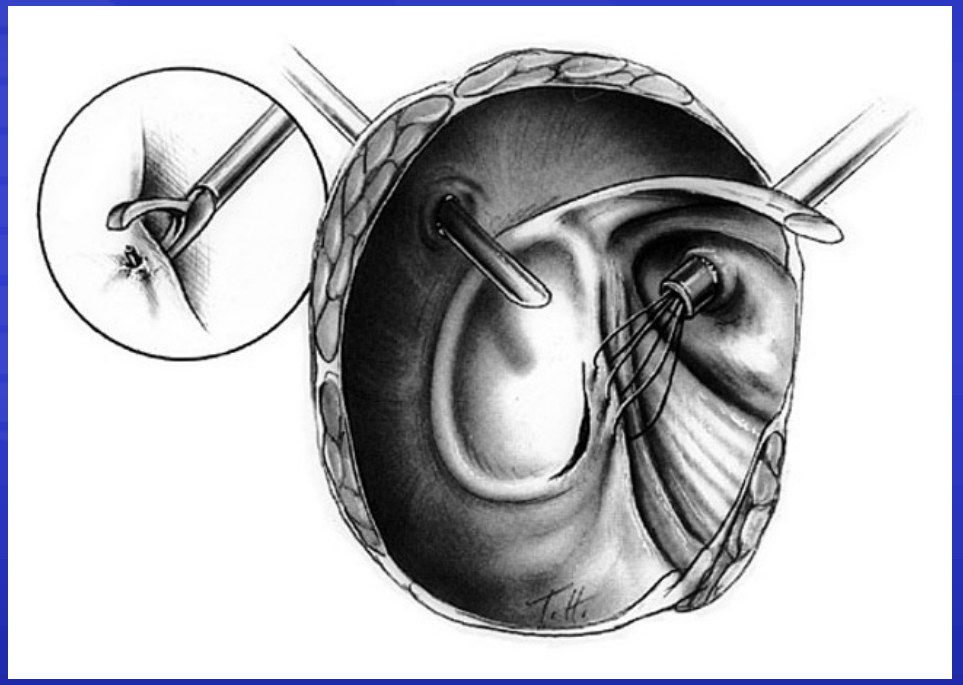


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Arthroscopic Stabilisation

- Currently the most popular procedure
- Addresses the anterior labral tear
- Tightens the anterior capsule
- Minimally invasive, does not violate subscapularis
- Does NOT address any bone loss

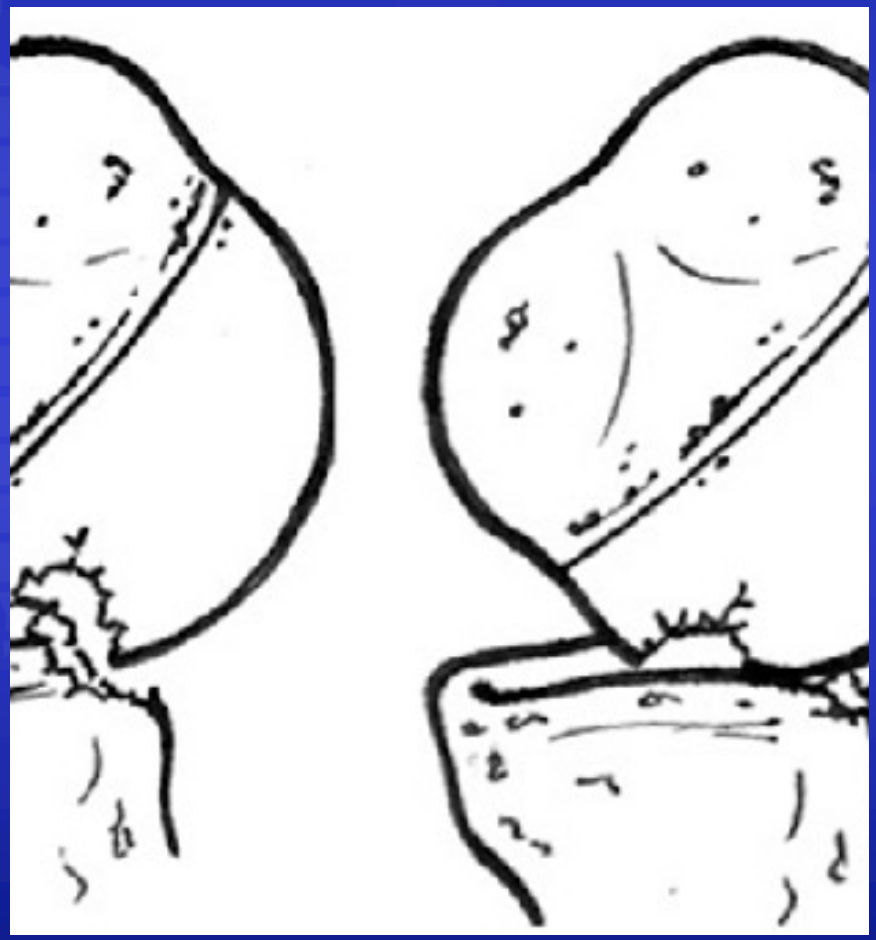


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Bone loss leads to higher recurrences

- Studies with arthroscopic Bankart repair showed excellent results when no bone loss
- Higher dislocation rates with glenoid bone loss or Hill Sachs defects
- Must evaluate the bone loss prior to surgery
- Choose a procedure that will address all aspects of pathology

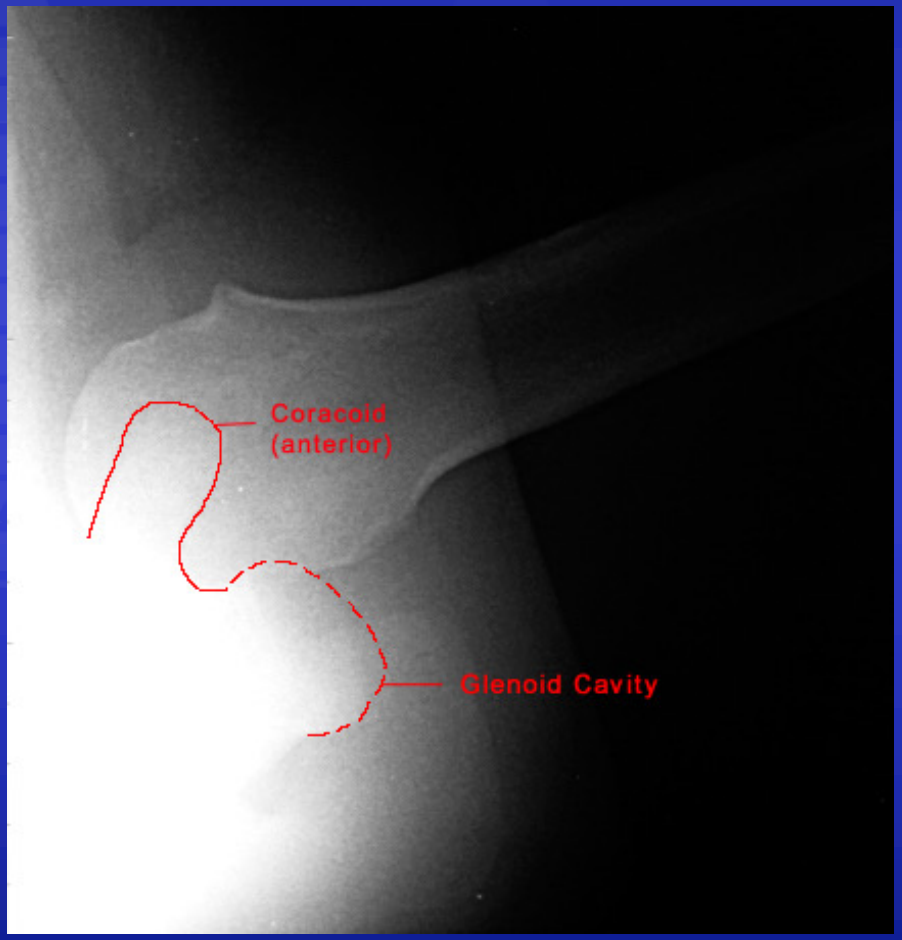


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

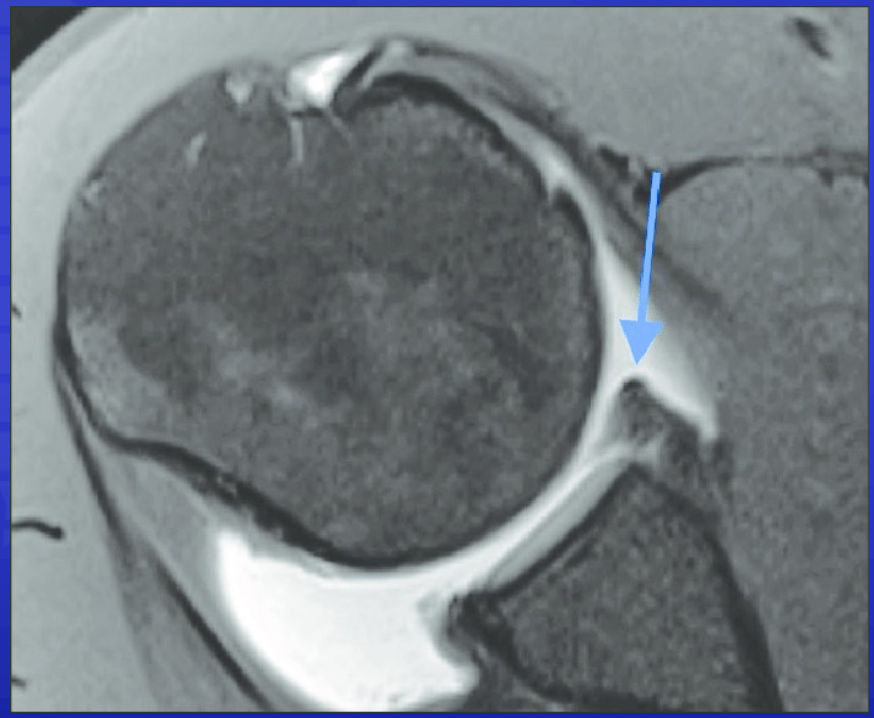
Investigations

- X-rays help to show type of dislocation
- Will not help to quantify bone loss



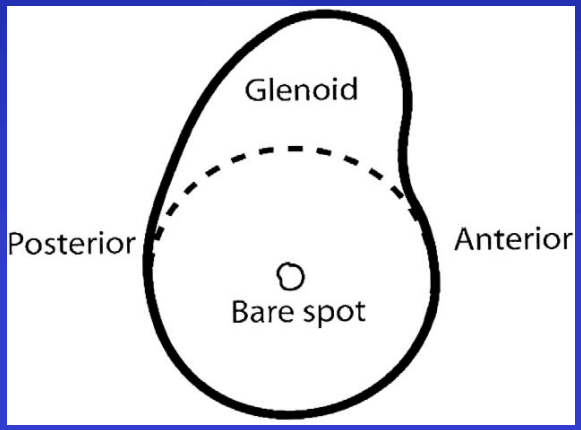
MR Arthrogram

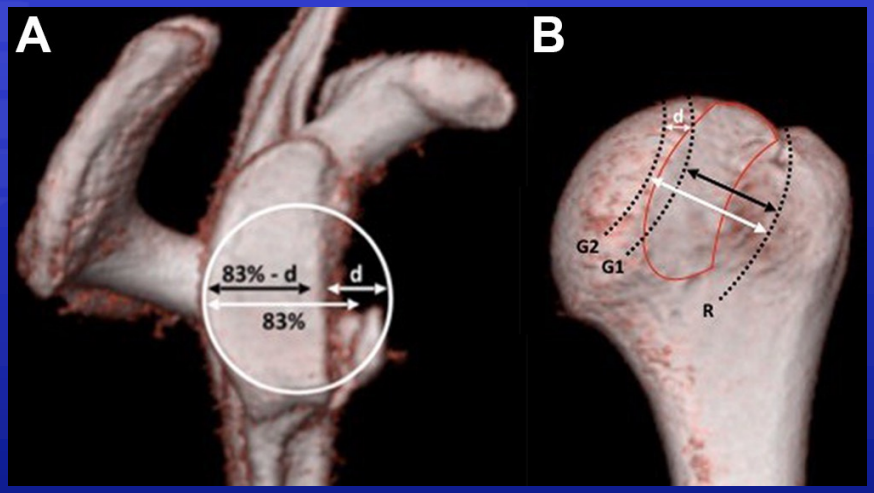
- The arthrogram helps to delineate labral tears
- Important to assess rotator cuff, labrum and soft tissue
- Can show bone loss glenoid and hill sachs
- May overestimate bone loss



3D CT scan with humeral head subtraction

- Allows for ability to measure bone loss
- Glenoid bone loss
- Humeral head
- The amount of bone loss helps determine best procedure.



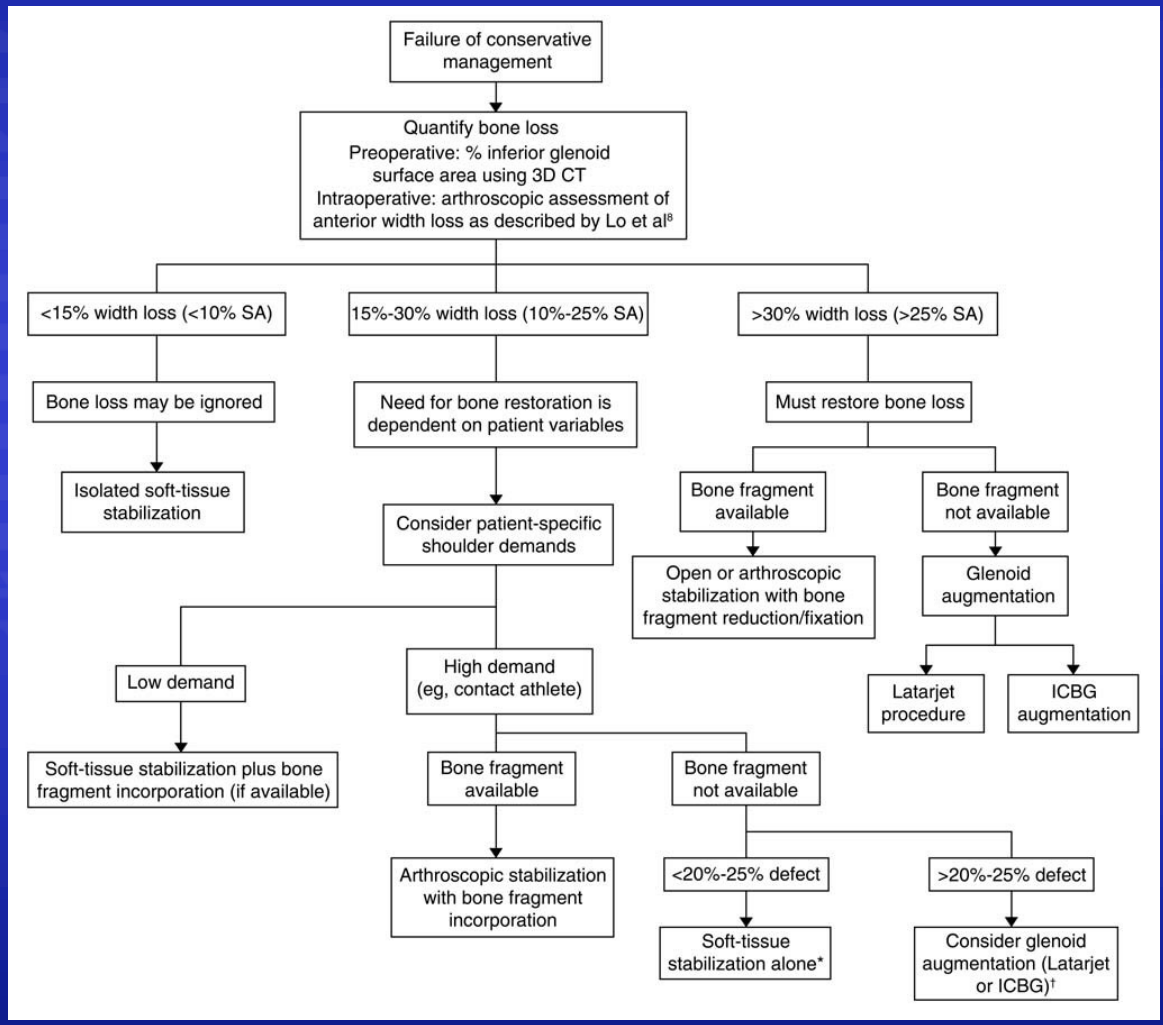


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Surgical Decision Making

- Less than 15% bone loss
  - Arthroscopic stabilisation.
- >30%
  - Bone graft glenoid
  - Latarjet
- 15%-30%
  - Controversy
  - Remplissage most helpful

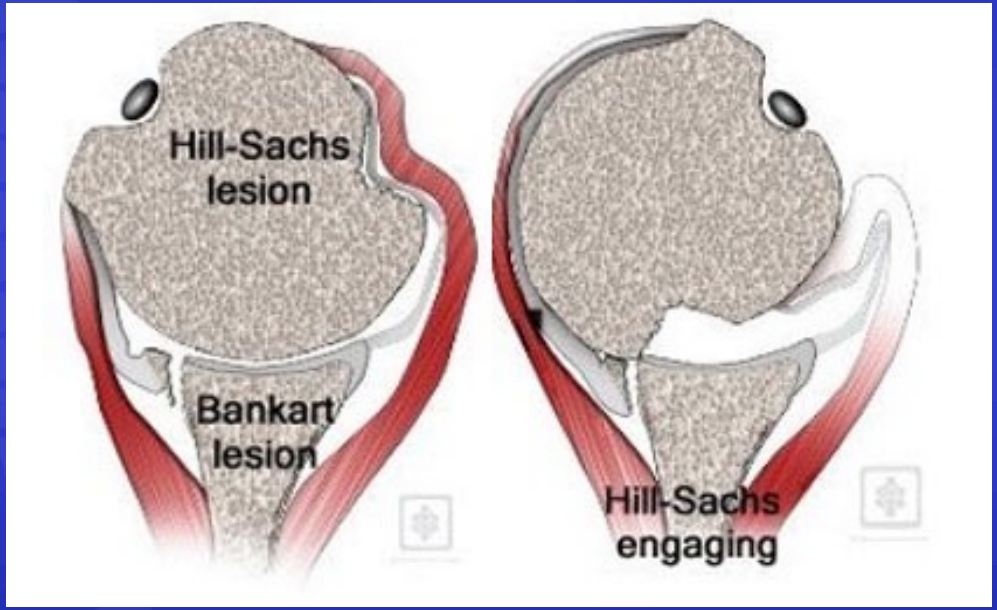


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Bipolar bone loss

- Both glenoid bone loss and hill sachs defect lead to increased risk of dislocation
- How much bone loss can we accept

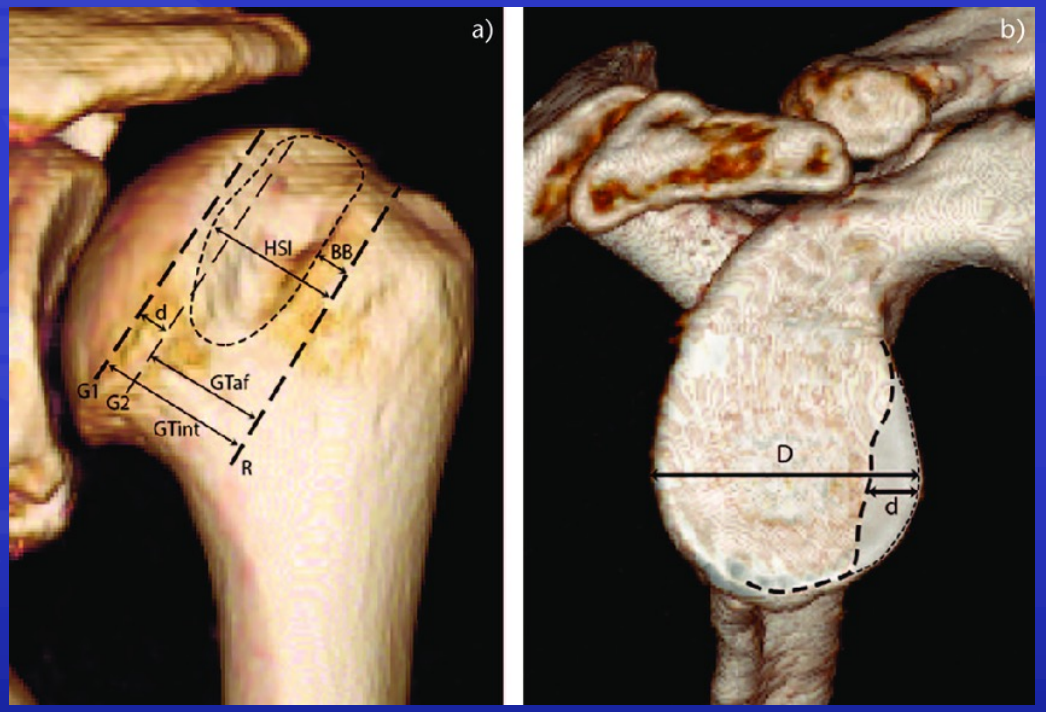


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Glenoid Track

- Used to quantify bipolar bone loss
- How much is tolerated
- Width of hill Sach's measured
- Width of glenoid is measured
- 83% of NORMAL glenoid is needed for normal function

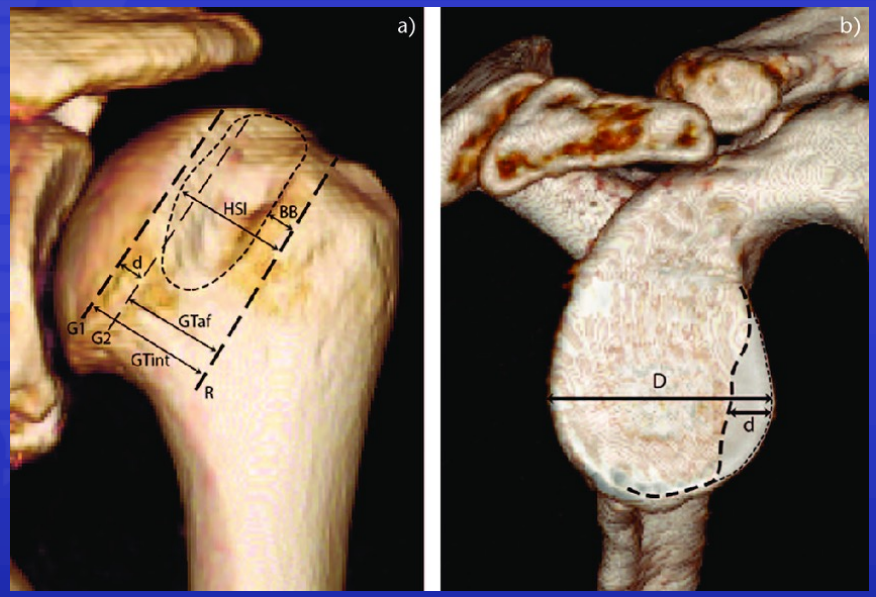


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Glenoid track calculated

- Measure glenoid width D (2X radius, circle, or opposite)
- Glenoid track= 83% D
- Measure bone defect d
- Subtract d from D
- (defect reduces glenoid track “safe zone”
- Measure hill sacs defect (HSI)
- Compare glenoid track to hill sachs defect
- G1 represents normal shoulder- “on” track as defect within safe zone
- G2 represents glenoid lesion- “off” track as defect exceeds width of track

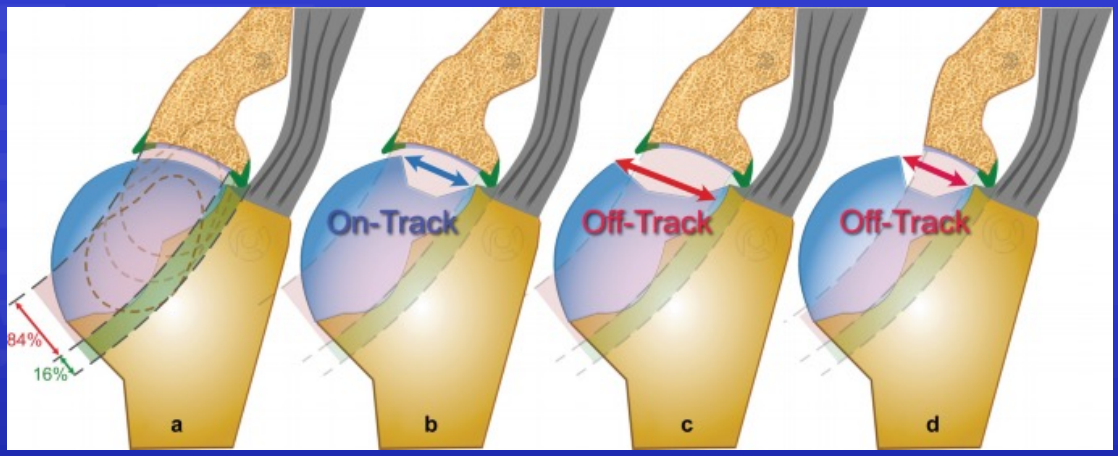


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Glenoid track

- Hill-sachs should be smaller than glenoid track, if smaller, than is an ON track lesion
- If Hill-sachs is larger, than is an OFF track lesion with higher risk of dislocation.
- Concept Addresses BIPOLAR, image on far right

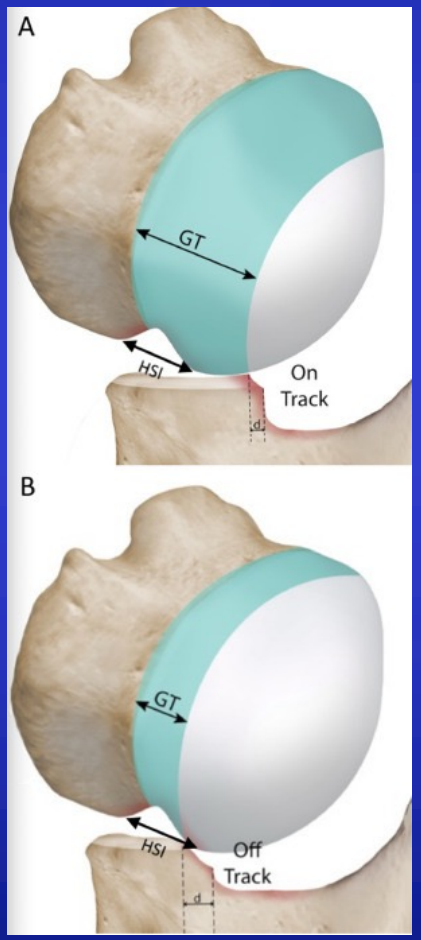


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

For OFF track lesions

- Arthroscopic stabilisation is not powerful enough
- Burkhart, Debeer- higher recurrences with bone loss
- Arthroscopic stabilisation with Remplissage
- Latarjet

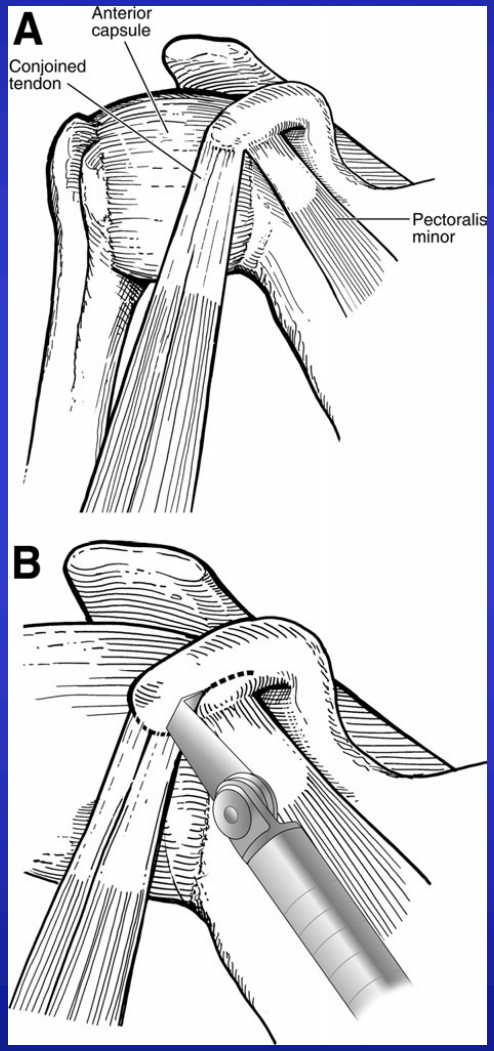


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Latarjet

- Bone graft glenoid
- The coracoid with conjoint tendon (biceps short head and coracobrachialis)
- In the same incision
- Curved shape fits on glenoid well.

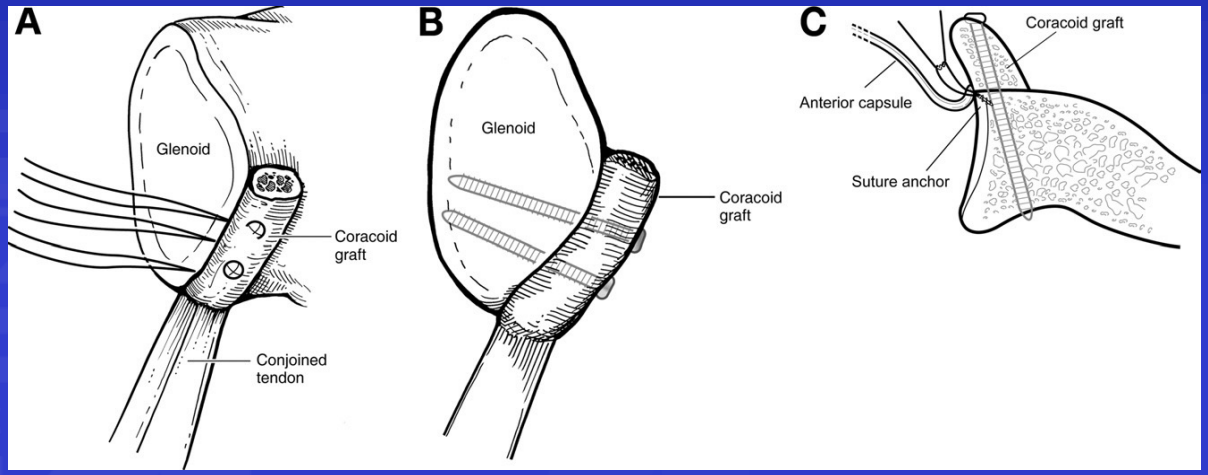


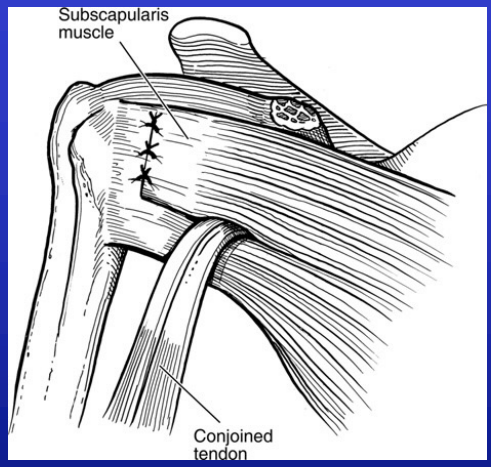
ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Latarjet

- The bone restores bone loss
- The conjoint tendon serves as a check rein
- Prevents anterior subluxation



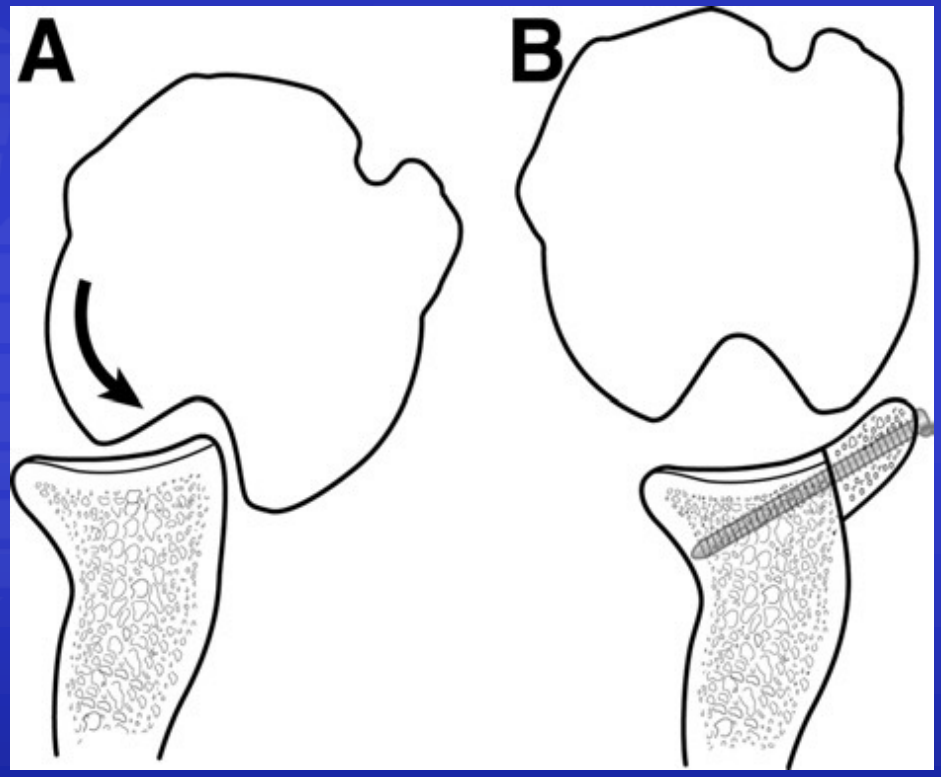


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Latarjet

- Increases the arc so hill Sach's does not engage
- This procedure indirectly addresses Hill-Sachs
- Makes "off" track lesion an "on" track lesion



ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

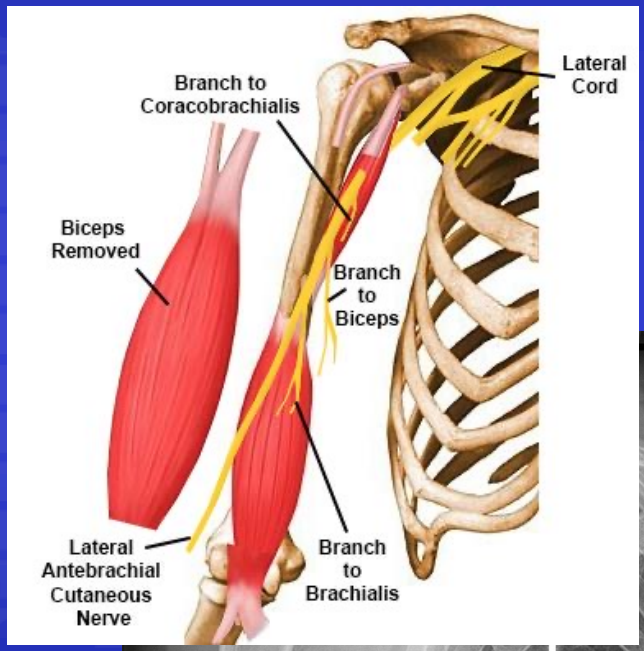
Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

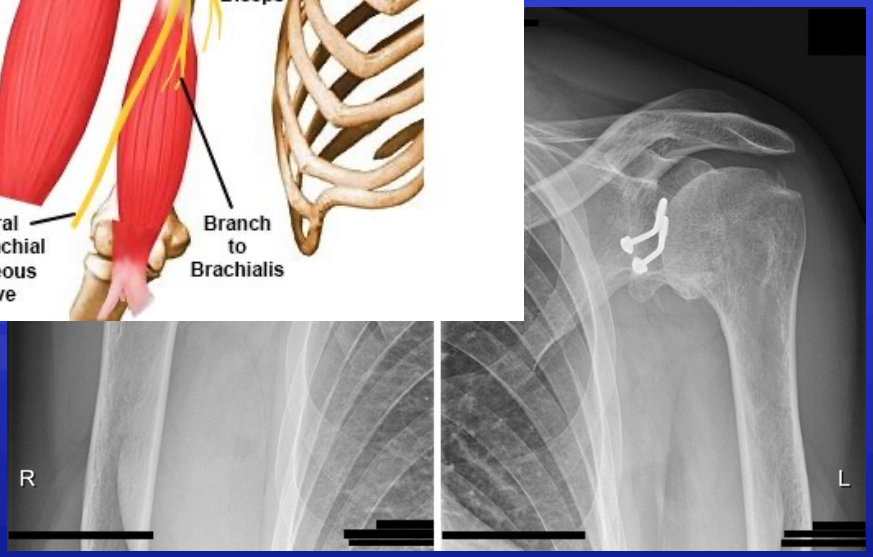
Latarjet

- Highly successful procedure
- Gained popularity in Sydney
- Good for contact athletes
- Less than 10% recurrence rate

Latarjet- complications

- Bone graft resorption
  - Exposed screws
  - Recurrent instability
  - Damaged cartilage humeral head
  - Arthritis
- Hardware failure
  - Common with seizures
- Nonunion
- Nerve problems
  - Musculocutaneous nerve
  - Innervates coracobrachialise, biceps brachii, brachialis
  - Main flexors of the elbow
  - Catastrophic complication
- Recurrent subluxation/dislocation
  - Complex revisions
  - Anatomy already altered
  - If latarjet fails, can't do a remplissage
  - If remplissage fails, may still do latarjet



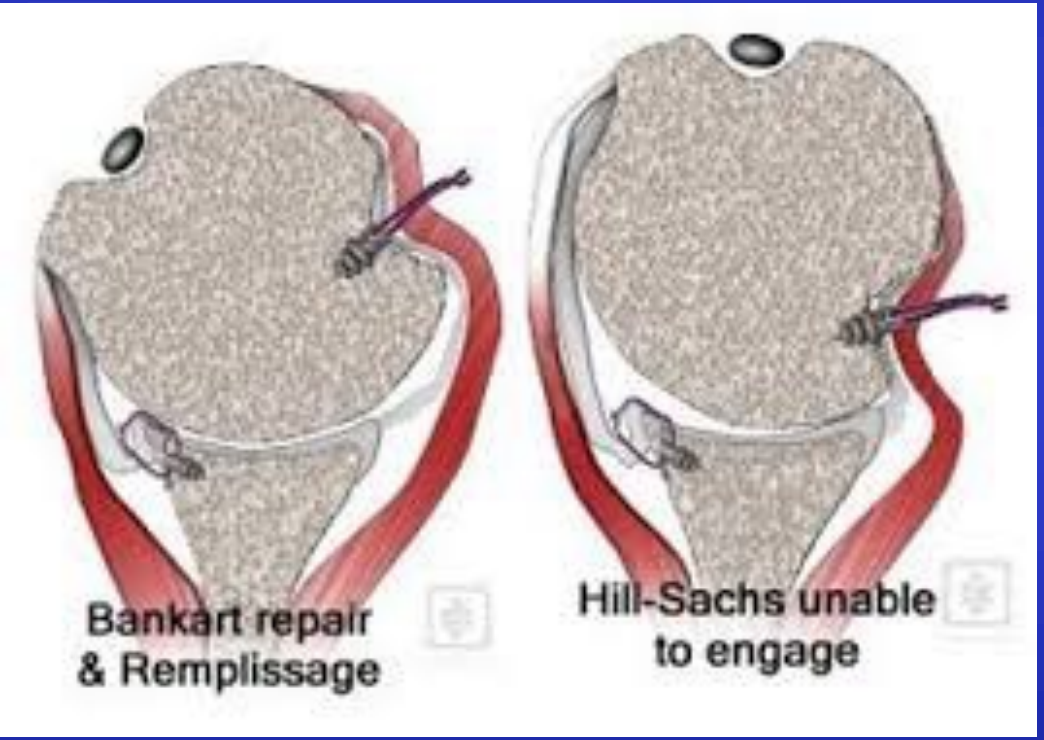


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

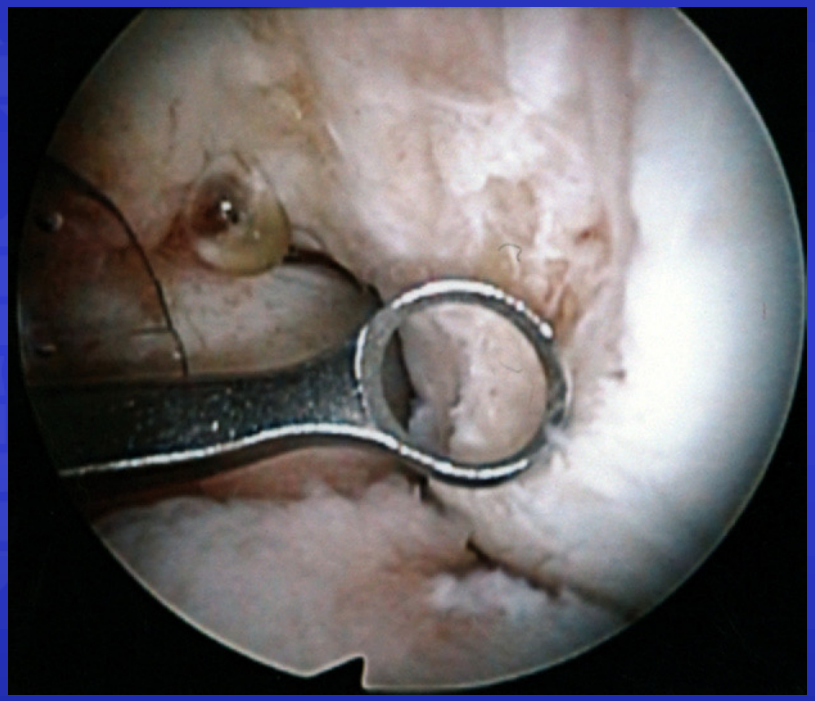
Remplissage

- French for “fill”
- Fill the defect
- Makes the defect extra-articular so it does not engage with anterior bone defect



Remplissage- arthroscopic

- Procedure is done with arthroscopic bankart repair
- Technique has become efficient
- Knotless or tied “blindly”
- Adds little time to procedure

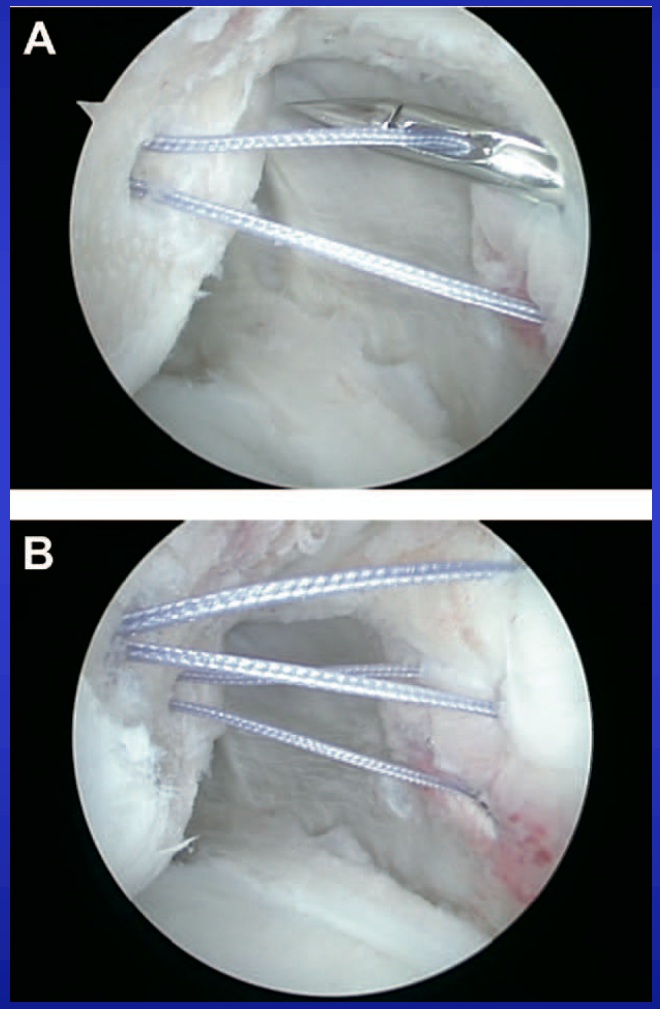


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Remplissage vs Latarjet

- Uses anchors- plastic, absorbable, sutures, no metal
- No risk of resorption or hardware complications as with latarjet
- No evidence procedure increases arthritis
- No risk of nerve injury to musculocutaneous nerve
- Does not burn bridges. Can do latarjet if this fails.



ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Remplissage over Latarjet

- Compared functional outcome, return to sport, satisfaction, recurrence, and complications
- Remplissage vs latarjet
  - Remplissage as good as latarjet or superior, with higher return to sport
  - Fewer complications (0% vs 6%)
  - Latarjet complications(haematoma, infection, neuropraxia, hardware, and bone healing-related issues)
  - Recurrence rates similar, even with “off” track lesions
  - Some external rotation loss in Remplissage over latarjet

- J Arthroscopy, 2022
  - Denard

Remplissage vs. bankart repair alone

- Compared arthroscopic bankart alone, with remplissage, to latarjet
- Remplissage and latarjet both reduced recurrent dislocations
- Latarjet had a higher complication rate than remplissage

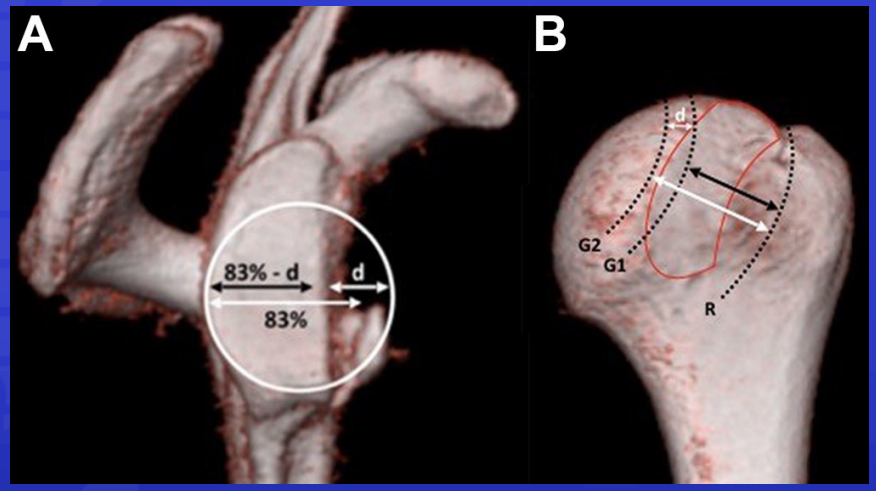
- Meta-analysis
- J Shoulder and Elbow 2020

	Recurrent dislocation rates	Complication rate
Arthroscopic Bankart Alone	17%	
With remplissage	6%	0.5%
Latarjet	10%	9%

ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

My preference

- MR arthrogram
- 3D CT when suspect bone loss
- Less than 15%- arthroscopic bankart
- Lower threshold to perform remplissage “on” or “off” track
- Latarjet when greater than 25% glenoid bone loss

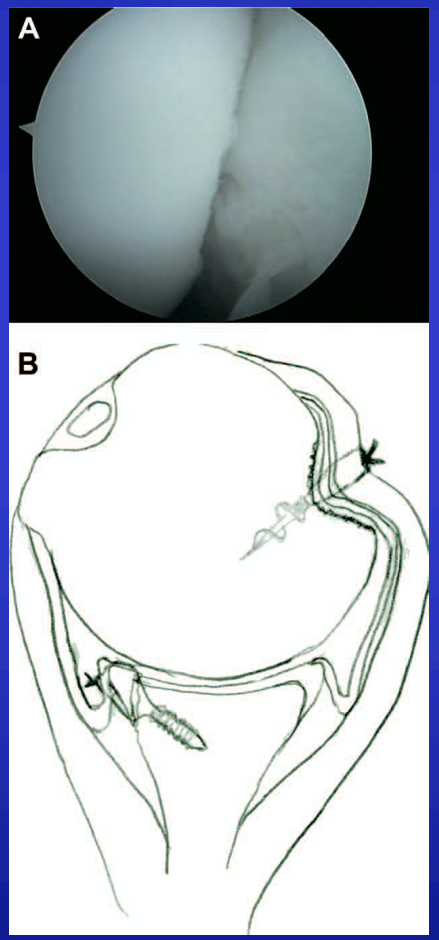


ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery

Summary

- Shoulder stabilisation evolved to address bone loss
- Addition of remplissage is simple, lower complication rate, with equivalent or superior outcomes compared to open latarjet
- If fails, one can do a latarjet as back up
- Remplissage a viable solution for bipolar bone loss



ORTHOSPORTS
ORTHOPAEDIC & SPORTS MEDICINE SERVICE

Dr Todd Gothelf
Shoulder, Foot & Ankle Surgery