Introduction

Two types of *total* shoulder arthroplasty

- **Anatomical Total Shoulder**
  - First utilized in the 1950’s for fractures
  - Today – primarily used to treat end-stage osteoarthritis

- **Reverse Total Shoulder**
  - Has been used in France since the 1980’s
  - Approved in the U.S. in 2004
  - Primarily used for arthritis with a rotator cuff deficiency
  - Also, indicated for fractures and revision total shoulder arthroplasty
  - Indications are expanding
Anatomical Total Shoulder

Normal Shoulder

A Normal Shoulder
- Clavicle (collar bone)
- Healthy Cartilage
- Scapula (shoulder blade)
- Humerus (upper arm bone)

Supraspinatus
- Subscapularis

Supraspinatus

Subscapularis
Development of Arthritis

Healthy Shoulder Joint:
- Humerus
- Scapula
- Cartilage

Osteoarthritis:
- Damaged cartilage
- Bone spurs

Radiographs showing progression of arthritis.

- Initial healthy joint
- Joint with damage
- Advanced joint with bone spurs
Symptoms

- Pain
  - Progress over time
  - Worse with activity
  - Interferes with sleep
  - Loss of Motion
- Atrophy (wasting) of muscles
- Swelling
- Crepitus (clicking, popping or crunching sound)
- Tenderness to touch
Non-Operative Treatment

- Anti-inflammatory Medications (NSAIDs)
- Cortisone Injections*
- Physical Therapy
- Activity Modification
When to Consider Surgery

Quality of Life Decision

- Interferes with activities
- Loss of independence
  - Grooming
  - Bathing
  - Dressing, etc.
- Interferes with sleep
- Interferes with work
Example: TSA
Example: TSA
How It’s Done

Incision

- From collar bone down the arm
How It’s Done

- Release subscap tendon
- Allows visibility of joint
- MUST BE REPAIRED AND PROTECTED

- Remove arthritis from the humeral head
How It’s Done

Insert stem into humeral shaft

The humeral head is removed and a tunnel is drilled into the shaft.
The glenoid surface is abraded and prepared to receive the prosthesis.

Connect ball to stem

Ball inserted

Implant completed
How It’s Done

Remove arthritis from glenoid

Replace with plastic socket
How It’s Done

Repair the subscapularis tendon

- Takes 3 months to heal
- Must be protected
- Shoulder Immobilizer for 6 weeks
Finished Product
Post-Operative Rehabilitation

Phase 1 (0-6 weeks)
- Shoulder Immobilizer
- Pendulum exercises only
- Pool therapy
Phase 2 (6-12 weeks)

- Stretching
- Sling when out of house
- Begin to use arm
- Golf putt, no swing
- No lifting
Post-Operative Rehabilitation

Phase 3 (3 months+)

- Strengthening
- Activities as tolerated at 6 months
What to Expect

90-95% Successful

- Pain Relief
- Improvement in function
  - Increased range of motion
  - Increased ability to perform activities
  - Improved quality of life
- Return of Independence
What will I be able to do?

**Recommended / Allowed**

- Cross-country skiing
- Stationary skiing *
- Speed walking and jogging
- Swimming
- Doubles tennis
- Low-impact aerobics
- Bicycling; road/stationary
- Bowling
- Canoeing
- Croquet
- Shuffle board
- Horseshoes
- Dancing; ballroom/square/jazz

* Nordic track

*Activity after Total Shoulder Arthroplasty-1999*

*American Shoulder and Elbow Society Survey*
Complications

- Infection
- Wound problems
- Excessive blood loss
- Injury to nerves and blood vessels
- Failure of Subscapularis Repair
- Mechanical Failure of Device
- Fracture

- Weakness
- Stiffness
- Subluxation or dislocation of the prosthesis
- Requirement for additional surgery
- Anesthetic risks
Anatomical Total Shoulder Example
Anatomical Total Shoulder Example
# Outcomes

344 primary anatomical total Shoulders  
Revision Rate = 4%  
F/U time – 50 months

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<tr>
<th>Measure</th>
<th>Pre-Op</th>
<th>Post-Op</th>
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<td>Pre FF</td>
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<td>Pre Abd</td>
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<td>Pre IR</td>
<td>S1</td>
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Revision Rate = 4%

F/U time = 50 months
Reverse Shoulder Arthroplasty

• Rotator cuff & deltoid work together to stabilize the glenohumeral joint

• The deltoid moment leads to glenohumeral instability

• Glenohumeral motion 120°

• Glenohumeral and scapular-thoracic motion is lost
Normal Shoulder

- Rotator cuff stabilizes joint
- Smooth Motion

Shoulder without Rotator Cuff

- Unstable joint
- Upward migration of humeral head prevents normal motion
Arthritis with RC Deficiency

Normal Shoulder

Arthritic Shoulder

Arthritic Shoulder with RC Deficiency
Symptoms

- Pain
  - Progress over time
  - Worse with activity
  - Interferes with sleep
- Instability
- Loss of Motion

- Atrophy (wasting) of muscles
- Swelling
- Crepitus (clicking, popping or crunching sound)
- Tenderness to touch
Non-Operative Treatment

- Anti-Inflamatories (NSAIDs)
- Cortisone Injection
- Physical Therapy
- Activity Modifications

When to Consider Surgery

Quality of Life Decision

- Interferes with activities
- Loss of independence
  - Grooming
  - Bathing
  - Dressing, etc.
- Interferes with sleep
- Interferes with work
RSA Example
Components

- Plastic Spacer
- Baseplate
- Compression Screws
- Glenosphere
- Humeral Stem
How It’s Done

• Release subscap tendon
• Allows visibility of joint
• MUST BE REPAIRED AND PROTECTED

• Remove arthritis from the humeral head
Release the Subscapularis Tendon

- Rotator Cuff Tendon
- Allows visibility of joint
- MUST BE REPAIRED AND PROTECTED
Remove Arthritis from Humeral Head

Replace with metal stem and plastic socket
Remove Arthritis from Glenoid

Replace with metal glenosphere
How It’s Done

*Repair the subscapularis tendon*

- Takes 3 months to heal
- Must be protected
- Shoulder Immobilizer for 6 weeks
Finished Product
What to Expect

- Pain Relief
- Improvement in function
  - Increased range of motion
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Complications

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- Anesthetic risks
Finished Product

Pre-Operative

Post-Operative
Outcomes

- 76 Patients @ 5 years
- 94% Survivorship

<table>
<thead>
<tr>
<th></th>
<th>Pre-Operative</th>
<th>Post-Operative</th>
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<tbody>
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<td>ASES</td>
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<td>External Rotation</td>
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Conclusion

- Both TSA and RSA are effective treatment methods to reduce shoulder pain & dysfunction from arthritis with or without a rotator cuff tear
- Patients should expect to have greater function & less pain
- Complication rates are low for both procedures
- Patients typically remain in hospital for 2 days
- The surgery is well-tolerated overall
Thank You