Anatomic Arthroplasty in the Young Patient

Humeral Head Replacement With Glenoid Reaming Arthroplasty
“Ream and Run”

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- Details on AAOS website

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What is Youth?

- Age
- Activity level and expectations
- Medical status and co-morbidities
- 55 yo commonly cited as young

What is Long-Term?

- Arbitrarily defined as 10 years

Life Expectancy

- Social Security Administration Actuarial Life Table (2009)

Age	Male	Female
55	25.21	28.60
65	17.51	20.19
75	10.87	12.79

Life Expectancy

- In 2008 about 30% TSA patients are younger than 70 years

Age Years	#TSA	% of Total
18-44	429	1.6
45-64	7316	27.4
65-84	17856	66.8
≥ 85	1118	4.2

Kim et al JBJS - 2011

Australian Registry 2008-2013

- 20,262 primary shoulder arthroplasty
- 22% less than age 65
- 10% revision conventional TSA at 7 yr

Table ST4: Yearly Cumulative Percent Revision of Primary Total Shoulder Replacement by Shoulder Class

CPR	1 Yr	2 Yrs	3 Yrs	4 Yrs	5 Yrs	6 Yrs	7 Yrs
Total Resurfacing	2.8 (1.1, 7.5)	5.8 (2.8, 12.0)	7.8 (3.7, 15.9)				
Total Mid Head	1.8 (0.5, 7.1)						
Total Conventional	3.2 (2.8, 3.7)	5.6 (5.0, 6.2)	6.7 (6.1, 7.4)	7.4 (6.8, 8.2)	8.1 (7.3, 8.9)	8.6 (7.7, 9.6)	10.1 (8.2, 12.3)
Total Reverse	2.8 (2.4, 3.2)	3.6 (3.1, 4.0)	4.0 (3.5, 4.6)	4.5 (3.9, 5.1)	5.0 (4.3, 5.7)	5.3 (4.5, 6.3)	5.8 (4.6, 7.3)
All Total Shoulder	**3.0 (2.8, 3.3)**	**4.7 (4.3, 5.0)**	**5.5 (5.1, 6.0)**	**6.2 (5.7, 6.6)**	**6.7 (6.2, 7.3)**	**7.2 (6.6, 7.9)**	**8.3 (7.0, 9.8)**

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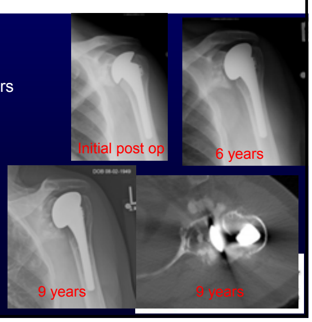
Mid- to long-term follow-up of total shoulder arthroplasty using a keeled glenoid in young adults with primary glenohumeral arthritis

JSES 2013

Patrick J. Denard, MD[a,b,*], Patric Raiss, MD[c], Boris Sowa, MD[c], Gilles Walch, MD[d]

- Level IV case series
- 50 TSAs for 1° OA aged 55 years or younger
- Minimum fu 5 yr (mean 9.5 yr)
- Glenoid revision for loosening
  - 2% at 5 years
  - 38% at 10 years



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Goals of Arthroplasty in Younger Patients

- Pain relief
- Functional restoration
- Avoid early complications and need for short-term revision surgery
- Predictable long-term outcome

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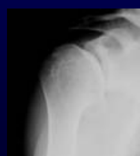
Patient Expectations

- Younger patients more active
- Outcome goals and expectations differ from older patients
- Return to labor, sports, heavier vigorous activities

McCarty et al AJSM 2008
  Patients who participated in sports or recreation before arthroplasty
  64% had surgery to be able to participate in sports or recreation

Zarkadas et al JSES 2011
  TSA 89% participated in medium and high demand activities and sports after arthroplasty



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Anatomic Arthroplasty Options

- Humeral head resurfacing
- Humeral head replacement
  - without glenoid preparation
  - biologic glenoid resurfacing
  - "Ream and run"
- Total shoulder arthroplasty

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A Comparison of Pain, Strength, Range of Motion, and Functional Outcomes After Hemiarthroplasty and Total Shoulder Arthroplasty in Patients with Osteoarthritis of the Shoulder. A Systematic Review and Meta-Analysis

Dianne Bryant, Robert Litchfield, Michael Sandow, Gary M. Gartsman, Gordon Guyatt and Alexandra Kirkley
J Bone Joint Surg Am. 2005;87:1947-1956. doi:10.2106/JBJS.D.02854

- Meta-analysis- RCTs; min 2 yr f/u
- 112 patients
- aTSA better functional outcome than HHR
- 6% HHR revised to TSR within 24 months
- 20% HHR revised to TSR within 48 months

- aTSA the "gold standard" for advanced glenohumeral arthritis

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aTSR vs HHR

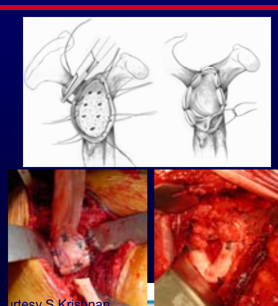
- Cohort groups too small and follow up too short to assess impact of various pre-operative, intra-operative, and post-operative factors on outcome

Here is the Problem

- Young patient-greater demands and expectations
- Long-term survivorship
- Late failure leads to pain and dysfunction
- May require revision surgery

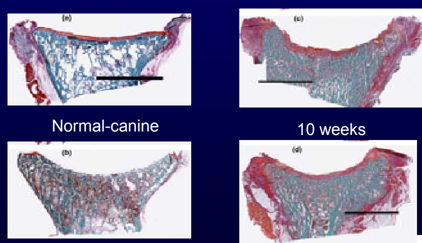
Biologic Resurfacing

- Fascia lata
- Achilles tendon
- Meniscal allograft
- Dermal graft
- Early results good
- Late results variable
  - Krishnan et al-JBJS-A 2007
  - Wirth JBJS-A 2009
  - Strauss et al JSES 2013



"Ream and Run"

Matsen, et al JOR 2005



Reamed

24 weeks

Shoulder hemiarthroplasty with concentric glenoid reaming in patients 55 years old or less

Matthew D. Saltzman, MD[a], Aaron M. Chamberlain, MD[b], Deana M. Mercer, MD[b], Winston J. Warme, MD[b], Alexander L. Bertelsen, PA-C[b], Frederick A. Matsen III, MD[b,*]

JSES 2011

- Level IV case series
- 65 shoulders ; <55yo
- Mean f/u unrevised 43 mth
- 14% revision
- In selected patients 55 years or younger significant improvement in self-assessed shoulder comfort and function

Humeral Preparation

- Standard humeral exposure and preparation
- Lesser tuberosity osteotomy
- Short stem or stemless
- Size humeral head

Glenoid Preparation

- Glenoid exposure
- Excise labrum
- Central pilot hole for reamer
- Ream to have 2-3mm diameter mismatch with humeral head
- Partially correct posterior retroversion and eccentric wear

Short Term Outcome

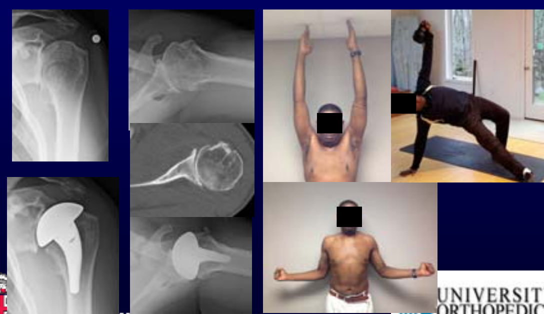
- 46 patients- 43 males
- Patients selected the procedure
- Mean age 58
- 12-48 mth fu
- No revisions

	Pre Op	Post op
ASES	32	79
AFE	110°	138°
AER	10°	36°

Total Shoulder Arthroplasty

- Excellent pain relief and functional restoration
- Faster recovery
- What about long-term outcome?

48 yo RHD Male "Ream and Run"



What Do I Do For Young Arthritic Shoulder?

- Shared decision making
  - Counsel patient
- Total shoulder
  - most predictable outcome, pain relief, and function
  - glenoid will likely fail
- Humeral head replacement with glenoid reaming arthroplasty
  - high demand physically active patient

18 Kilo Kettle Bell work out

Different Perspective?


Thank You!
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