

Unicompartmental Knee Replacement

Results and Techniques



Alexander P. Sah, MD

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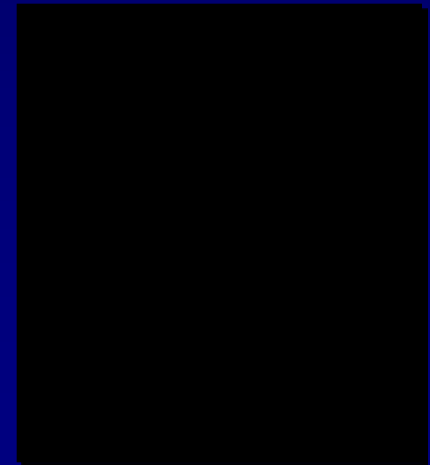
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Overview

- Why partial knee replacement? - *versus TKA*
- Medial UKA - *bearing type and results*
- Lateral UKA - *unique features*
- Patellofemoral replacement - *pros and cons*





Why Partial Knee Replacement?

- Potential benefits
 - ✓ less invasive procedure
 - ✓ bone conserving
 - ✓ less blood loss
 - ✓ ligament preserving
 - ✓ better range of motion
 - ✓ faster recovery
 - ✓ more “normal” feeling knee



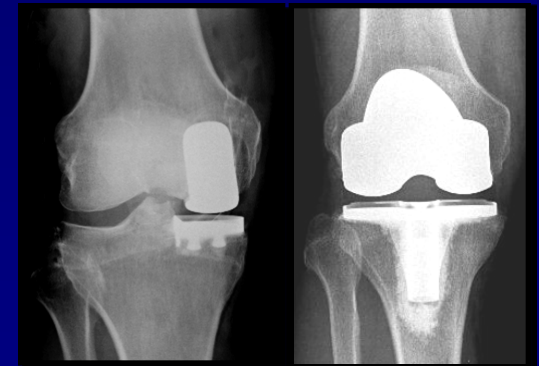
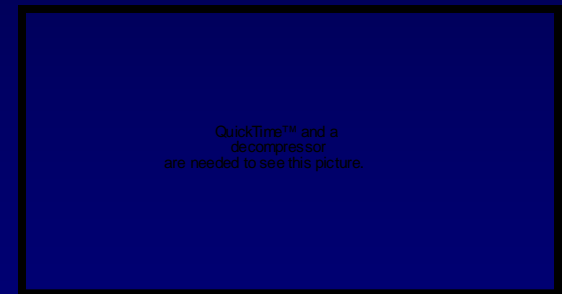
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UKA versus TKA

□ UKA can have superior results compared to TKA

- 200 knees, 46% candidates for UKA (Willis-Owen 2009)
 - UKA function superior to TKA, medial and lateral UKA indistinguishable compared to age matched healthy knees using Total Knee Questionnaire
- 23 patients- UKA and TKA in same patient (Laurencin 1991)
 - range of motion improvement and patient preference for UKA
- 23 patients- UKA and TKA in same patient (Dalury 2009)
 - improved range of motion and patient preference
- 54 matched patients (Amin 2006)
 - improved motion UKA
- 102 randomized to UKA or TKA, 15 years follow-up (Newman 2009)
 - early improved results of UKA are maintained with no increase in failures

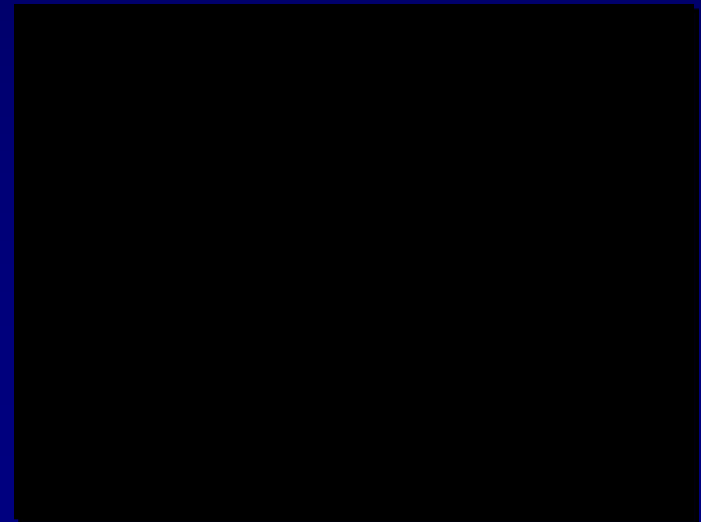




Keys for Success

Keys for successful UKA

- ✓ Patient Selection
- ✓ Well designed implant
- ✓ Surgical Technique





Patient Selection

□ Traditional criteria:

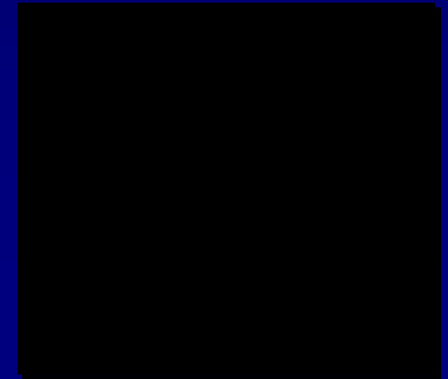
- elderly
- slender (<82kg)
- sedentary
- functional ACL
- ROM >90 degrees
- minimal deformity

➤ Cautious expansion of indications

- younger
- increased weight
- amount of disease in other compartments
- ACL more critical for lateral UKA

Evaluation and imaging studies

- Physical examination
- Stress radiographs
- MRI





Medial UKA

□ Potential benefits of mobile bearing

- restoration of knee kinematics
- decreased wear with increased implant conformity
- lower polyethylene stresses



▪ Fixed-bearing versus mobile bearing

- risk of dislocation 1-2%, less tolerance of ACL deficiency, limited role in lateral compartment

✓ Similar survivorship and outcomes

- Finnish registry 2007- 1928 UKAs survivorship of 81% for oxford and 79% for MG designs
- Whittaker 2010 no difference in outcomes or durability in KSS and WOMAC



➤ Mobile-bearing series report poorer outcomes of lateral vs. medial UKA due to bearing instability

- Gunther reported on 53 lateral Oxford UKAs with 75% functioning well, but 21% failed at average 5-year follow-up





Medial UKA Survivorship

UKA survivorship is durable at long-term follow-up

- 140 UKAs with 84% 22 year survivorship (Squire and Callaghan 1999)
- 160 UKA with 94% at 10 years (Argenson 2002)
- 62 UKA 11-13 years 98% survivorship (Berger 2005)
- 136 UKA 21 year survivorship 84% at 20 years and 75% at 25 years (O'Rourke 2005)
- 20 year survivorship 86% and 80% at 25 years (Steele 2006)





Lateral UKA

Represent only about 10% of all UKAs

Tibia internally rotates with increasing flexion and lateral side rolls
back more than medial side

Bigger AP/ML ratio than medial side

More laxity

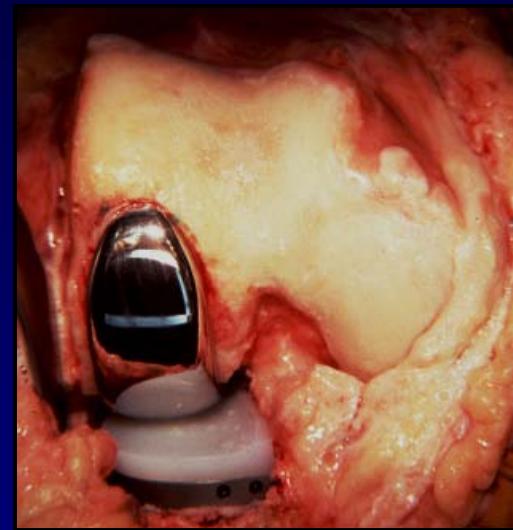
Wear more posterior in pattern

Technical issues for lateral UKA:

- excess laxity of compartment makes it easier to “overstuff”
- smaller compartment needs smaller devices
- screw-home mechanism so tibial component slightly internally rotated
- anatomical differences with medial-lateral dimension and potential for patellar impingement



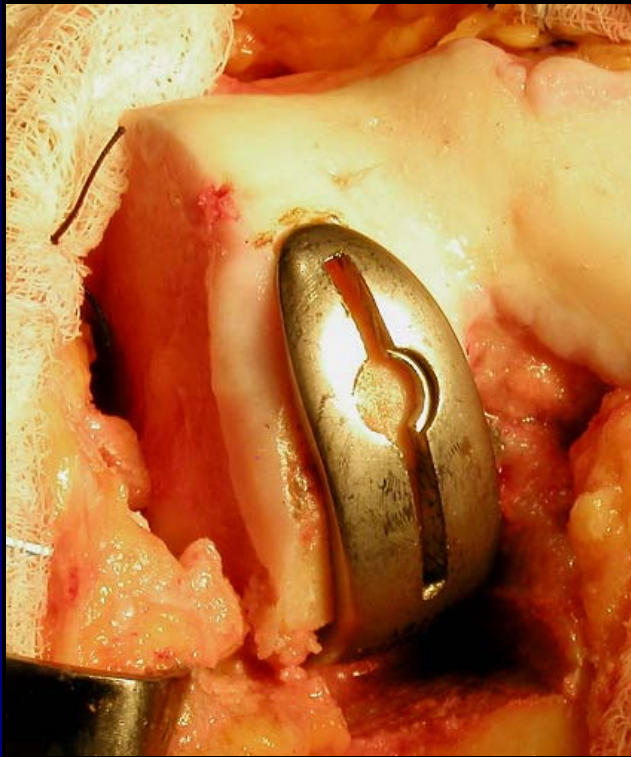
Lateral UKA with Medial approach



The anterior horn of the medial meniscus should not be compromised with a medial approach



Lateral UKA



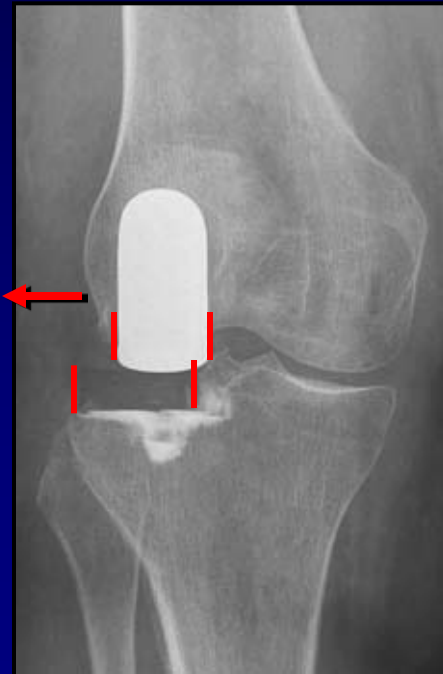
**Under-resection of the distal lateral condyle
will prevent proper recession of the leading
edge of the femoral component**

**Over-sizing a lateral femoral component
will also risk patellar impingement**



Lateral UKA

In the medial-lateral dimension, the femoral component must be shifted laterally to maximize tibio-femoral component congruency in extension.





Lateral UKA- Results

Technically more challenging

Results comparable to medial UKAs

- Pennington (2006) 29 lateral UKA follow-up 12 years with no revisions
- Argenson (2008) 40 lateral UKA 12 years with survivorship 92% at 10 years and 84% at 16 years
- Sah and Scott (2007) 49 lateral UKA average 5.2 year follow-up with no revisions





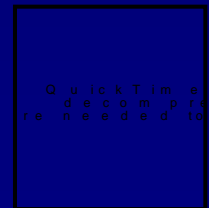
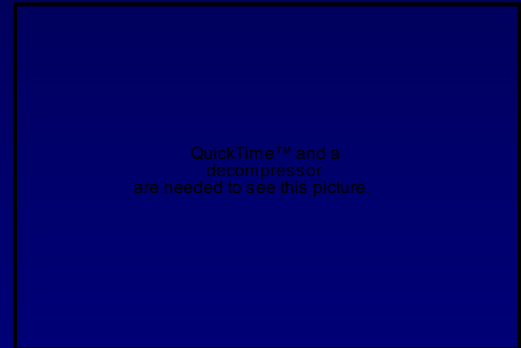
Patellofemoral Replacement

Incidence

- isolated PF arthritis in as many as 11% of men and 24% of women older than 55 years with symptomatic OA of knee
- isolated PF arthritis in 9.2% of patients older than 40
- 7-19% of patients experience residual anterior knee pain with TKA if done for isolated PF arthritis

Imaging

- weightbearing AP xrays to best evaluate tibiofemoral involvement
- midflexion PA views needed
- lateral radiographs to evaluate alta or baja
- axial radiographs for trochlear dysplasia, tilt, subluxation, extent of PF arthritis
- MRI and arthroscopic photos if available





Patellofemoral Replacement

Indications

- ✓ OA limited to PF joint
- ✓ symptoms referred to PF joint unresponsive to nonoperative treatment
- ✓ post-traumatic arthritis
- ✓ failed extensor unloading surgical procedure
- ✓ malalignment/dysplasia induced degeneration

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Contraindications

- ❖ inadequate nonoperative treatment or failure to rule out other sources of pain
- ❖ arthritis involving tibiofemoral articulation
- ❖ systemic inflammatory arthropathy
- ❖ grade 3 or less of PF joint
- ❖ patella baja
- ❖ uncorrected PF instability or malalignment
- ❖ active infection
- ❖ chronic regional pain syndrome or evidence of psychogenic pain
- ❖ fixed loss of knee ROM, minimum of 10-110 degrees

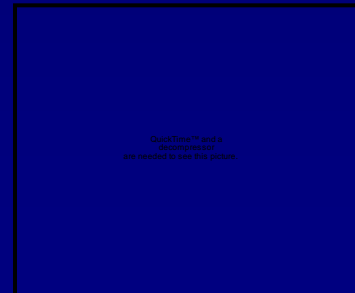




Patellofemoral Replacement

Results

- majority of failures related to patellar instability from uncorrected malalignment, soft-tissue imbalance, component malposition
- with improved designs, tibiofemoral arthritis has become primary source of failure
- subsidence of loosening <1%
- PF replacement restores excellent function
- Several studies show progression of arthritis about 20% at 15 years
- Leadbetter 2006 JBJS, 30 PFA with 83% success at average 2 years, 84% survival at 10 years (van Jonbergen 2010)





Conversion of UKA to TKA

Conversions can achieve results similar to primary TKA

- Springer 2006, 22 conversions of UKA to TKA were successful
 - Saldanha 2007, revision of UKA to TKA is favorable to revision TKA
 - Johnson 2007, survivorship and results of converted UKAs to TKAs are comparable to primary TKAs
 - Levine 1996, conversion superior to failed TKAs and comparable to primary TKA
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- Lonner 2006 JBJS 12 failed PFAs revised, at mean 3.1 years the TKAs were functioning well





Summary

- ✓ Partial knee replacement has many benefits with excellent results
- ✓ Patient selection is critical
- ✓ 10 year results rival TKA outcomes
- ✓ Confidence that UKA role is perhaps expanding for isolated disease of knee

