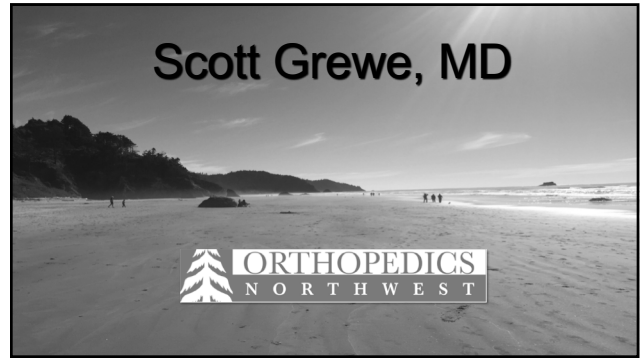
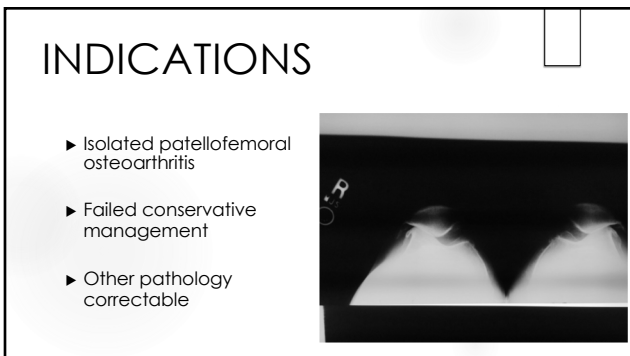


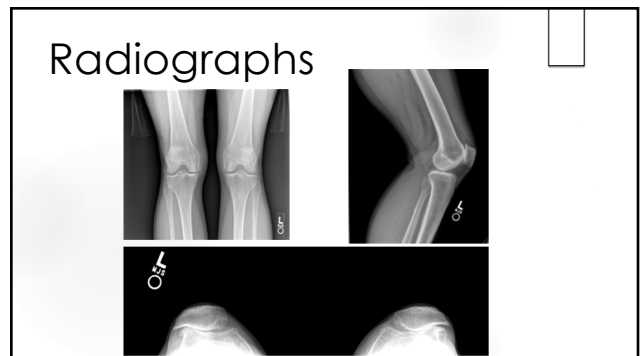
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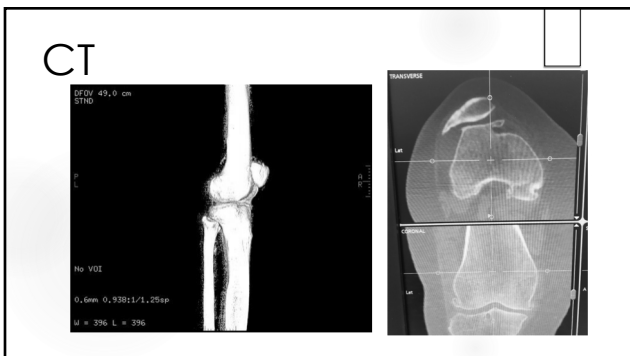
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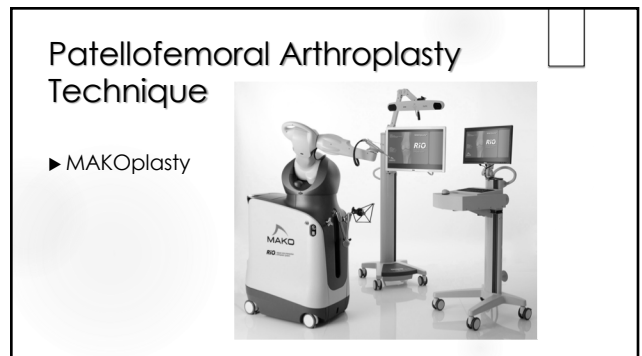
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5



6

Position Patient

- ▶ DEMAYO or Stryker leg holder
- ▶ Medial position for patellar resection



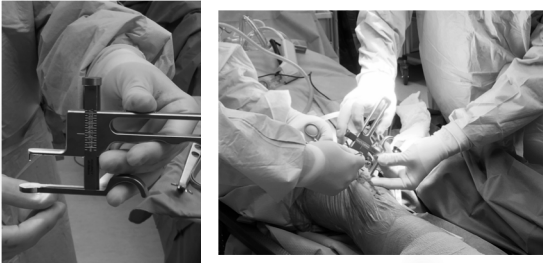
7

Medial
arthrotomy,
quadriceps
sparing



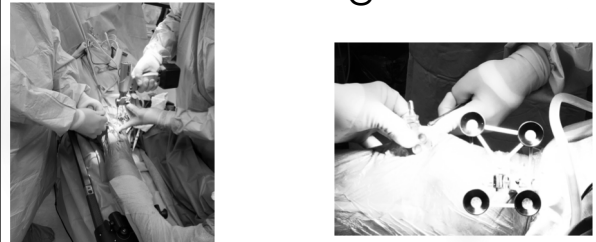
8

Measure Patella Thickness



9

Patellar Resection and sizing



10

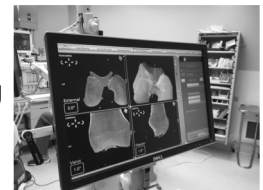
Patella Retractor



11

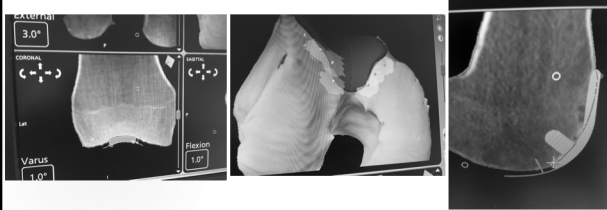
Programming

- ▶ Assemble points
- ▶ Cartilage mapping
- ▶ Position implant



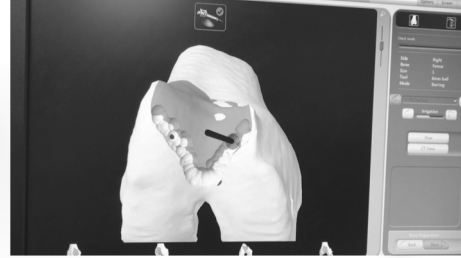
12

Plan Implant Positioning



13

MAKO Trochlear Resection



15

Drilling the Patella



16

Trial components

►Fit and Tracking



17

Finishing Touches

- Cementation
- Exparel Injection
- Close
- Rehabilitation



18

Outcome Variability

- INDICATIONS
- PATIENT SELECTION
- MALALIGNMENT
- INSTABILITY

19

HISTORY

- ▶ Specific pain location
- ▶ Systemic disease
- ▶ Trauma
- ▶ Previous surgery
- ▶ Activity restrictions
- ▶ Patellofemoral specific activities- stairs hills, rising from a chair, theater sign

20

Physical Exam

- ▶ General physical exam
 - ▶ Habitus
 - ▶ Varus/Valgus Alignment
 - ▶ Ligamentous laxity
 - ▶ Knee exam
 - ▶ Specific patellofemoral exam



22

Passive Patellar Tilt

- ▶ Evaluates lateral retinacular tightness
- ▶ Tilt up lateral patella with knee in extension
 - ▶ $< 0^\circ$, Tight lateral retinaculum
 - ▶ $0-20^\circ$, normal
 - ▶ $> 20^\circ$, hypermobile



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Patellar Glides

- ▶ Knee in 30° of flexion
 - ▶ 0-4 quadrants, medial and lateral
 - ▶ < 1 , tight
 - ▶ > 3 , laxity
 - ▶ Apprehension sign



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Patellar Glides

- ▶ Evaluates other factors of stability
 - ▶ Trochlear hypoplasia
 - ▶ Patella alta
 - ▶ Retinacular laxity

25

Tubercle-sulcus angle

- ▶ Angle between quadriceps and patellar tendon
- ▶ Q Angle at 90° degrees of flexion
- ▶ Less than 14° is normal
- ▶ Physical Exam equivalent of TT-TG




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Imaging- Radiographs

- ▶ 40 ° Flexion PA weight bearing view-
Rosenberg/Salt Lake
- ▶ Lateral at 45 ° of flexion
- ▶ Merchant view
- ▶ 51 inch alignment film

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Imaging-Radiographs




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Imaging-Radiographs

Lateral view

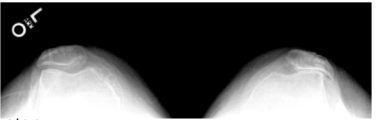
- ▶ Blumenstats line at 40° flexion
- ▶ Caton-Deschamps Index
- ▶ Insall-Salvati Index



29

Imaging-Radiographs


- ▶ MERCHANT VIEW
- ▶ Patellar position
- ▶ Trochlear morphology
- ▶ Degenerative changes
- ▶ Subluxation and tilt



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Imaging-Radiographs

- ▶ 51 inch alignment film
- ▶ Varus/Valgus Deformity

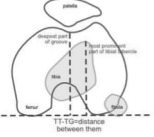


31

Imaging-CT/MRI

- ▶ Evaluate medial and lateral compartments
- ▶ TT-TG Tibial Tubercle-Trochlear Groove

- ▶ < 15 mm, normal
- ▶ 15-20 mm, borderline
- ▶ >20 mm, abnormal
- ▶ Stanford MSK MRI Atlas



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Patellar Malalignment

- ▶ Tight or loose lateral retinaculum
- ▶ Instability and alignment
- ▶ Correlate with physical exam

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Patellar Pathology-Tight or Loose

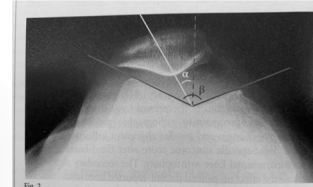
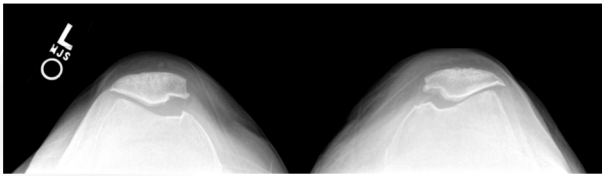


Fig. 2
Merchant view radiograph showing the patellar congruence angle. The sulcus angle (β) was determined by identifying the highest points of the medial and lateral condyles and the lowest point of the intercondylar

▶ J. Burger et al. JBJS 101-A No 18 p1662

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Lateral Patellar Subluxation



35

Correct Other Pathology

- ▶ Arthroscopy
- ▶ Realignment- Tibial Tubercle Osteotomy
- ▶ Lateral Release

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REALIGNMENT -Lateral Tracking Patella

- ▶ Correct angle with tubercle osteotomy
- ▶ Tubercle sulcus angle or TT-TG measurement
- ▶ Technique

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TIBIAL TUBERCLE OSTEOTOMY

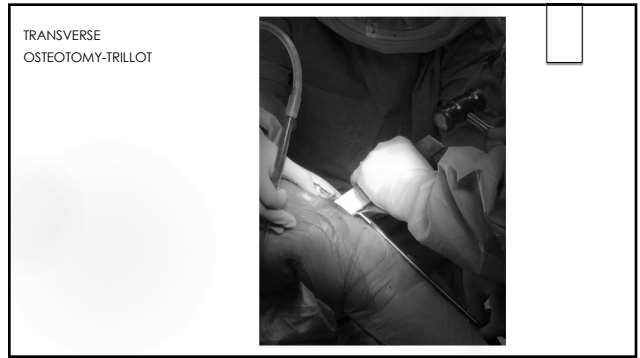
- ▶ Over-drill 3.5mm anterior hole
- ▶ Countersink
- ▶ AP osteotomy on lateral cortex to remove lateral bone prominence
- ▶ Transverse osteotomy
- ▶ Temporary fixation with drill bit
- ▶ Compression fixation with 3.5mm screws



38



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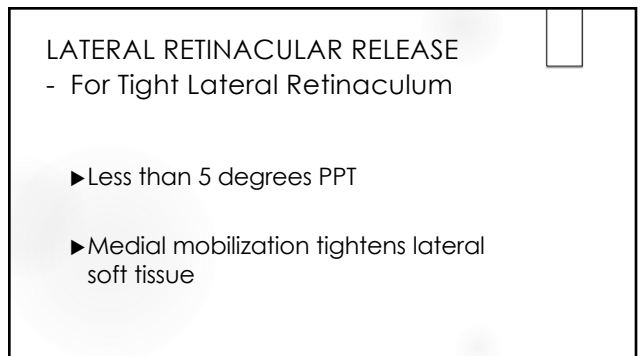
41



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43



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LATERAL RETINACULAR RELEASE

--- Destabilizes Patella

- ▶ Lateral retinaculum is a restraint to lateral patella translation (10%)
 - ▶ Desio et al AJSM 1998
- ▶ Has a posteriorizing vector
- ▶ Release results in 16-19% decreased force to lateral displacement
- ▶ Last line of defense in limiting lateral displacement with incompetent MPFL.
 - ▶ Christoforakis, JKS, sports traumatology, Arthroscopy 2006

45

Medial Patellar Subluxation- Previous Lateral Release

46

PROSTHESIS CONSIDERATIONS

- ▶ 1st GENERATION
 - Link Lubinus Prosthesis 1975, 55% unsatisfactory results. Tauro et al JBJS (BR) 83B, 7/2001
 - Smith & Nephew-Richards Deep constrained trochlear groove
- ▶ 2nd GENERATION
 - Stryker Avon—TKA anterior cut, less restricting
- ▶ 3rd GENERATION
 - Zimmer - TKA type intramedullary guide and anterior cut.

Customized Trochlea?
Computer matched robotics

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Inlay/Onlay Concept

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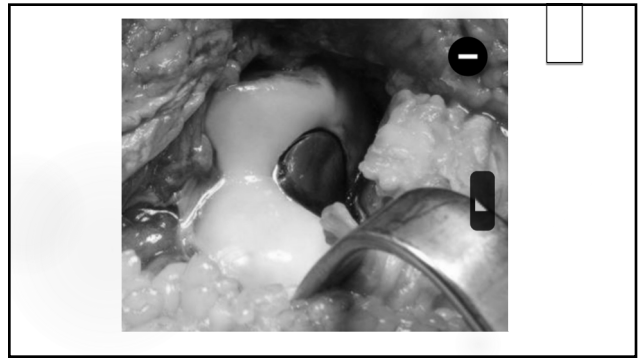
Optimum Patellofemoral Prosthesis Design

- ENGAGES PATELLA IN FULL EXTENSION
- UNCONSTRAINED
- MATCHES FEMORAL ANATOMY
- CONSERVATIVE BONE RESECTION

- ▶ 1st Generation Complications: 17% Only
- ▶ 2nd Generation Complications: 4% Inlay

Laskin, Richard, Corr 11:2004

51

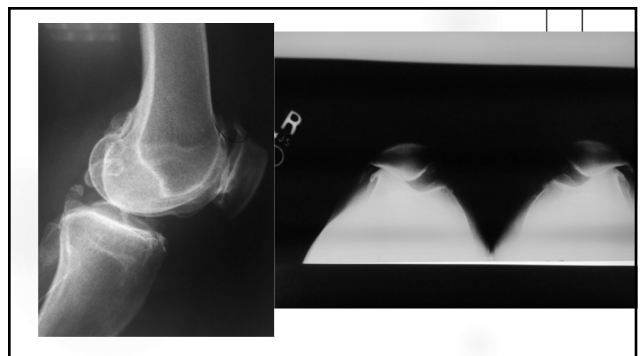


52

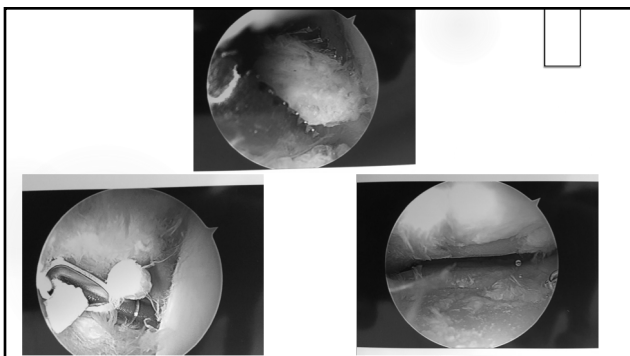
Patellofemoral Reconstruction Cases

- ▶ 45 year old professional with bilateral patellofemoral arthritis
- ▶ Symptoms uncontrolled with conservative management
- ▶ Patellar malalignment – tubercle osteotomy
- ▶ Loose bodies - arthroscopy

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55

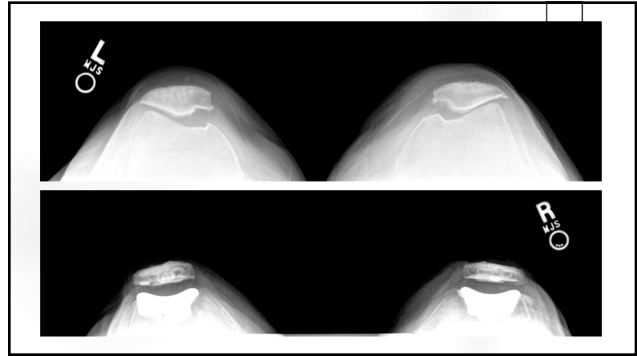


56

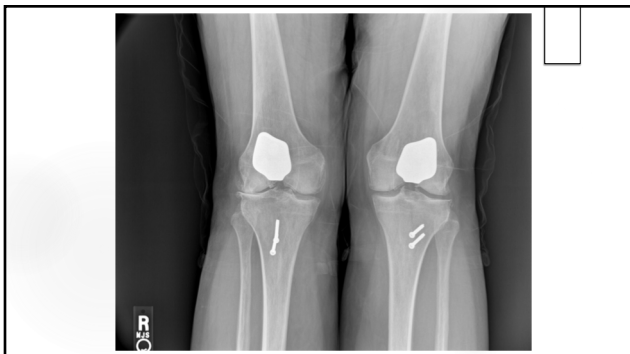
Disease Progression

- ▶ 66 year old PF DJD and malalignment
- ▶ Right PF replacement, TTO, lateral release
- ▶ Left side 1 year later
- ▶ Symptomatic right knee 8 years later

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Bicompartmental Arthroplasty

- ▶ Varus correction affects patellar tracking



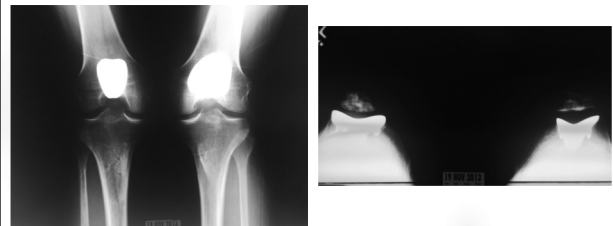
60

POSTOP PATELLAR INSTABILITY

- ▶ 50 year old female RN
- ▶ Generalized ligamentous hyperlaxity
- ▶ Inappropriate lateral release
- ▶ Bilateral patellofemoral arthroplasties
- ▶ Symptomatic patellar instability


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Bilateral Patellofemoral Arthroplasty



62

MPFL
Reconstruction for
patellar stability



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Conclusion

- ▶ CURRENT ROBOTICS OFFER IMPROVED TECHNIQUE FOR PATELOFEMORAL ARTHROPLASTY
- ▶ TREAT COMORBIDITIES
- ▶ SELECT APPROPRIATE IMPLANTS
- ▶ AVOID COMPLICATIONS
- ▶ LEARN TECHNIQUES
- ▶ UTILIZE PEER RESOURCES

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Thank You

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