UNICONDYLAR KNEE ARTHROPLASTY

Frank C. Smith MB, ChB, FRCSC
Assoc. Professor of Surgery
McMaster University, CANADA
HTO v UKR

- HTO - Distraction (Weale 2001)
  - 76 HTO, 65 patients with OA
  - Mean age 55, mean follow up 6yr
HTO v. UKR

- UKR Oxford < 60 years
  - Survival - JWG & US combined
    - 52 UKR, Follow up to 15 years
  - Function - All Oxford surgeons
    - 78 UKR, Mean follow up 5 years
Conclusion

- HTO function and survival worse than UKR (not RCT)
- What are the indications for HTO?
Conclusions

- Very high demand (e.g., contact sport), ACL deficient etc?
- Only definite indication primary tibia vara.
UKR and TKR Comparative studies

- **Rougaffe 1991**
  - 120 UKR & 91 TKR, mean 8 yr follow up

- **Laurencin 1991**
  - 23 bilateral UKR and TRK

- **Newman 1998**
  - RCT, 45 UKR & 46 TKR, 10yr follow up
Advantages - function

- Preserves undamaged structures
  - Cruciate mechanism - ‘normal’ kinematics.
- ROM better
Advantages - function

- Pain relief as good or better,
- Function better (gait studies)
  - Especially demanding activities eg stairs
  - Knee has a better “feel”
Advantages - morbidity

- Blood loss less and no transfusions
- Complications less frequent and severe
- Recovery and rehabilitation more rapid
Advantages - *morbidity*

- Cheaper implant and operation
- Minimal invasive surgery
UKR *disadvantage*

- Higher revision rate in initial studies
UKR disadvantages

Options

Accept

Don’t do UKR (eg USA)

Consider UKR as pre TKR (eg Repicci)

Minimise failure rate

To equal that of TKR
UNI KNEES

1) Fixed Bearing

1) Metal-on-plastic e.g.
   1) Gunston
   2) Cloutier
   3) Marmor
   4) Modular, I-III
   5) St Georg Sled
   6) Brigham
Uni Knees

Fixed Bearing

1) *Charnley* Plastic-on-metal

2) MIS e.g.
   1) *Repicci*, metal-on-plastic, inset bearing.
   2) *Preservation*
   3) *Eius*
   4) *Zimmer*
   5) *Etc., etc....*
Uni Knees

Mobile Bearing.

1. Fully conforming e.g.
   - Oxford
   - LCS

2. Maximally conforming e.g.
   - Uniglide
Patello-femoral Angle

- Preserved in Unicondylar Arthroplasty
- Cruciate and Collateral ligaments untouched
- Proprioception left intact
Saggital plane kinematics

- PFJ main problem of TKR
- Measure PTA
- PTA related to Tib/Fem kinematics
- PTA influences PFF
  - Lever arm (cf Maquet)
- In vivo fluoroscopic study
Uni Knees

- The key to a rapid recovery following UKA is subluxing the patella rather than dislocating and everting the quadriceps mechanism.
The First Mobile Bearing Uni

- The Oxford Unicompartment Knee
  - John Goodefellow
    - David Murray
Femoral component

- Four sizes

![Image of femoral component with four sizes: Standard]
Five years out
Ten Years out
Uni Knees

- Minimally invasive unicondylar versus total condylar knee arthroplasty--early results of a matched-pair comparison.

Yang KY, Wang MC, Yeo SJ, Lo NN.

Department of Orthopaedic Surgery, Singapore General Hospital, Outram Road, Singapore 169608. kyyang@orthopods.net
Uni Knees

Comparison of the two groups at six months show that patients with minimally invasive UKA have less blood loss, quicker rehabilitation, earlier ambulation, shorter hospitalisation stay and better post-operative range-of-motion with reduced hospitalisation cost.
Reflecting on a six-month follow-up and immediate post-operative events, we conclude that minimally invasive UKA is a relatively more cost effective procedure than TKA for these patients.
Uni Knees


Unicondylar arthroplasty: redefining itself.

Scott RD.

Harvard Medical School, Boston, Mass, USA.
Uni Knees

- Unicompartmental knee arthroplasty is the right operation for the right patient when performed by the right surgeon using the right surgical technique.
Uni Knees

Josten T. Sieman, Universität Leipzig

In the 90s significantly better results were noted with 5 and 10 years survival in more than 95% of the cases. Thus, like current studies prove, unicompartmental knee arthroplasties have reached the standard of complete surface replacement. Additionally, minimal loss of bone stock, sparing of the crucial ligaments, and a relatively lower incidence of complications and reoperations.
Uni Knees

- Unicompartmental osteoarthritis: an outpatient arthritic bypass Minimally invasive Unicondylar knee arthroplasty
  Repicci JA, Hartman JF.

This review summarizes past studies examining the progression of osteoarthritis (OA) of the knee.
Uni Knees

- They have led to the conclusion that the disease is slow, progressive, and typically limited to one tibio-femoral compartment.
Uni Knees

- Treatments such as Unicondylar Knee Arthroplasty (UKA)...
- That address the single diseased compartment, preserving bone and soft tissue...
- Seem appropriate.
Uni Knees

- Minimally invasive unicondylar versus total condylar knee arthroplasty--early results of a matched-pair comparison.

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Uni Knees

- Fifty consecutive patients with isolated medial compartmental osteoarthritis of the knee
- Were treated with minimally invasive unicompartmental knee arthroplasty (UKA).
Uni Knees

- An equal number of patients with total knee arthroplasty (TKA) performed in the same period were selected.
- They were matched with respect to:
  - age,
  - pre-operative range of motion,
  - radiological grade of knee arthrosis. (Kelgren)
Uni Knees

- UKA have:
  - Less blood loss,
  - Quicker rehabilitation
  - Earlier ambulation
  - Shorter hospitalisation stay
  - Better post-operative range-of-motion
  - Reduced hospitalisation cost.
Uni Knees

- Reflecting on a six-month follow-up and immediate post-operative events:
  - We conclude that minimally invasive UKA is a relatively more cost effective procedure than TKA for these patients.
Uni Knees


A comparative study of the medial St Georg sled and kinematic total knee arthroplasties. Ten-year survivorship.

Ackroyd CE, Whitehouse SL, Newman JH, Joslin CC.

Bristol Knee Group, Winford Unit, Avon Orthopaedic Centre, Westbury-on-Trym, Bristol, England.
There was no statistically significant ($p > 0.05$) difference between the rates of survival for the two types of arthroplasty using any of the endpoint criteria.
Uni Knees

- Good or excellent results were recorded for 77.9\% of the medial sled knees and 75.1\% for the Kinematic knees.
Uni Knees
Bristol Study

- The former (UKA) had 93.8% of cases with a final range of movement in excess of 90 degrees
- compared with 83.7% for the Kinematic knees (TKR) (p < 0.01).
UNI KNEES

- Cemented Unicondylar knees
  - Two cases of cement loose bodies
    - Definite “Proctalgia”
  - Search for Non-Cemented as the LCS had low loosening rate.
Incision

Medial pole of patella

Joint Line

Tibial Tuberosity
6 weeks post op
Uni Knees

- Case Reports
  - Tricky cases
81 Year old male

Still practising as ER Physician!
Now, at 87!!

Increasing varus
Knee pain and giving way
Night pain
81 Year old male

- Right tibial osteotomy 1988
- Atrial Fibrillation
- Coumadin
81 Year old male

- Options
  - Total knees
  - Uni left, total right
  - Unis
81 Year old male

- Two years later
  - Left knee fine
    - 0-120
  - Right knee
    - 0-110
    - Pain with weight bearing not localised
    - Pain if rolls over in bed
81 Year old male

- Nil to find at knee examination
- Pain on hip rotation
- Flexes only 70 deg.
81 Year old Male

- 6 years after knees and 4 years after THR
  - Walks 2 miles per day
  - Still working as Triage Doc in ER!
Uni Knees

**However:**

- Things can go Wrong!
Disaster Strikes !!
- 60 year old male widower
- Lives alone
- Multiple joint disease
- Two Crutches
- Morphine
5 months post op
Must Minimise failure rate

3 Factors

- Implant with minimal wear
  - (Many earlier UKR failures due to wear)
  - Fully congruent unconstrained mobile bearing

- Indications

- Surgical technique
Summary

- UKR superior to HTO in function and survival
- UKR have functional advantages over TKR
- UKR survival in general similar to TKR
Summary

Need to address:

- Implant
- Indications
- Surgical technique
ALL DONE

- Thank you