EARLY CLINICAL RESULTS OF PRIMARY CEMENTLESS TOTAL KNEE ARTHROPLASTY

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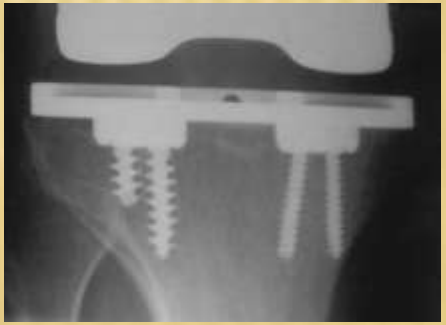
Cemented total knee replacements will remain the standard for total knee arthroplasty, however, some promising results have been demonstrated by use of uncemented designs with bioactive surfaces (eg, hydroxyapatite)

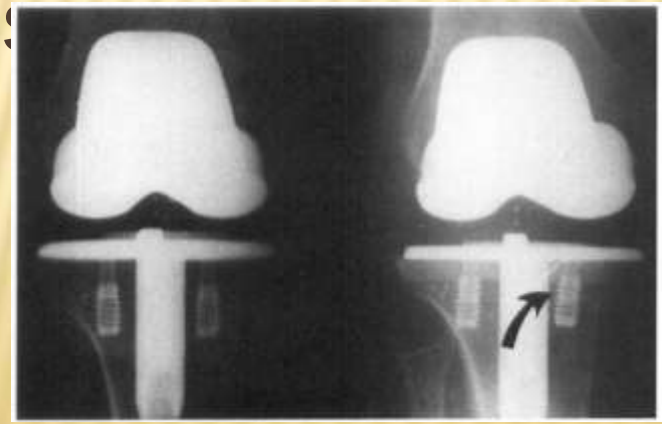
CEMENTLESS FIXATION BACKGROUND

- Cementless implants were introduced in the 1980s,
- Implants have a surface topography that is conductive to attracting new bone growth
- Screws or pegs are used to stabilize the implant until bone ingrowth occurs
- Cementless implants require a longer healing time than cemented replacements



CAUSES OF FAILURES

- Screw track osteolysis
- Poor polyethylene
- Metal-backed patellar component failure



IMPROVEMENT OF RESULTS

- Introduction of new porous materials and design modifications
- Highly porous metals
- Crosslinked polyethylene
- Advances in the surgical technique

ADVANTAGES

- Potential for lifetime fixation
- Preservation of bone stock
- Less potential for backside wear
- Shorter operative time

DISADVANTAGES

- Longer healing time
- The problems of wear and bone loss
- Higher prosthetic costs
- Dependence on precise surgical technique and prosthetic fit
- Dependence on bone quality
- Primary tibial fractures secondary to tibial loosening
- Unexplained periprosthetic pain

Criteria for Patient Selection

- Age is definitely a deciding factor
- Significant osteoporosis and inactive lifestyle precludes the use of cementless TKA
- Poor vascularity of underlying bone
- Poor ligamentous stability (excessive stress on implant bone interface)

(Murali Podeval, Kenneth Krackow 2001)

- OUR RESULTS

- This is by no means a comparison to cemented TKA
- Our goal is just to share with you our experience with cementless TKA

MATERIALS AND METHODS

- From March 2008 to February 2012
- Uncemented knee replacement were performed in 325
  patients (358 knees)
- Hybrid total knee replacement (cemented tibial tray) – 23 knees for 23 patients
- 2 knees with cementless patellar component
- Mean age of patients 64.7
- 118 men and 207 women
- Mean follow-up 2.1 years

PATIENTS

- Most patients had osteoarthritis – 303
- Chondrocalcinosis – 3
- Psoriatic arthropathy - 4
- Rhematoid arthritis – 12
- S/P HTO - 3

PROSTHESIS

- **Cementless LCS TKA was performed in 270 knees**

PROSTHESIS

- Uncemented ROCC Vanguard was used in 88 knees
- 44 of them by Signature system

PROSTHESIS

- Signature System has been used in 60 knees
- 44 of which are included in the actual follow-up

EVALUATION

- Patients were assessed clinically and radiologically at 3, 6. 12
  and 24 months postoperatively
- Evaluation was based on the Knee Society Score (clinical and functional)

KNEE SCORES

- The Knee Society clinical rating score consists of

  1. clinical results (pain, presence of flexion contraction, extension lag, total range of motion, alignment and stability)

  2. functional outcomes (distance walked, stair climbing and assistive device rating).

Every score has a maximum of 100 points.

Knee Society Score

Clinician's name (or ref) _____ **Patient's name (or ref)** _____

During the past 4 weeks..... **Click here for part 2 - FunctionScore**

Part 1 - Knee Score

Pain

- None
- Mild / Occasional
- Mild (Stairs only)
- Mild (Walking and Stairs
- Moderate - Occasional
- Moderate - Continual
- Severe

Flexion Contracture (if present)

- 5°-10°
- 10°-15°
- 16°-20°
- >20°

Extension lag

- <10°
- 10-20°
- >20°

Total Range of Flexion

0-5	6-10	11-15	16-20	21-25
26-30	31-35	36-40	41-45	46-50
51-55	56-60	61-65	66-70	71-75
76-80	81-85	86-90	91-95	96-100
101-105	106-110	111-115	116-120	121-125

Alignment (Varus & Valgus)

0	1	2	3	4
		5 - 10		
11	12	13	14	15
		Over 15°		

Stability (Maximum movement in any position)

Antero-posterior

- <5mm
- 5-10mm
- 10+mm

Mediolateral

- <5°
- 6-9°
- 10-14°
- 15°

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Final Knee Score is 0

(NB: consider a negitive outcome as zero)

Click here for part 2 - FunctionScore

Grading for the knee Society Score

Score 80-100 Excellent **Score 70-79** Good **Score 60-69** Fair **Score below 60** Poor

Reference for score: Insall JN, Dorr LD, Scott RD, Scott WN. Rationale of the Knee Society clinical rating

Knee Society Score - Function

Clinician's name (or ref) ----------

Patient's name (or ref) ----------

Please answer the following questions.

Part 2 - Function

Walking

- ○ Unlimited
- ○ >10 blocks
- ○ 5-10 blocks
- ○ <5 blocks
- ○ Housebound
- ○ Unable

Stairs

- ○ Normal Up and down
- ○ Normal Up down with rail
- ○ Up and down with rail
- ○ Up with rail, down unable
- ○ Unable

Walking aids used

- ○ None used
- ○ Use of Cane/Walking stick deduct
- ○ Two Canes/sticks
- ○ Crutches or frame

Function Score (Knee Society Score) is:

RESULTS

PREOPERATIVE

- Mean Knee Society Score 95 (47-148)
- Mean Flexion 110 (65 – 135)
- Mean Knee Society Clinical Score 41
- Mean Functional Score 54

POSTOPERATIVE

- Mean Knee Society Score 177 (98 – 200)
- Mean Flexion 118 (85– 130)
- Mean Knee Society Clinical Score 84
- Mean Functional Score 93

PAIN

According to Knee Society Score:

- None – 31
- Mild (Occasional) – 192
- Mild (Stairs only) – 64
- Mild (Walking and Stairs) – 35
- Moderate (Occasional) – 21
- Moderate (Continual) – 12
- Severe – 4

RADIOLOGICAL ASSESSMENT

- AP and lateral radiographs
- Measurement of prosthetic alignment
- Number and thickness of radiolucent lines
- **There have been no component subsidence or osteolysis**

ESTIMATED COMPLICATIONS

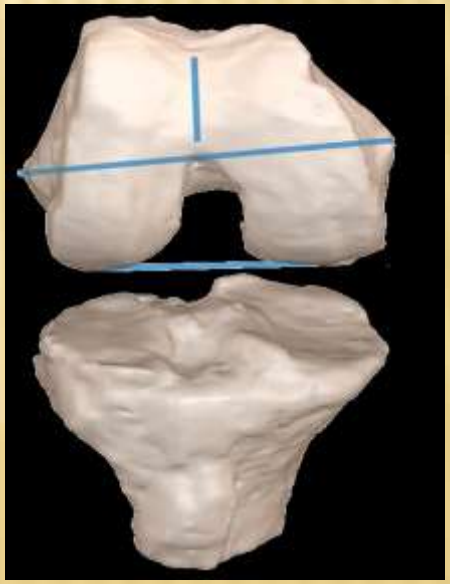
- Deep infection – 1 (treated by massive irrigation and poly replacement)
- Superficial surgical wound infection (treated with IV antibiotics) – 12
- DVT – 8
- Significant arthrofibrosis with stiff knee - 2
- Postoperative manipulation – 9
- Postoperative arthroscopy – 2
- None required revision surgery

OUR EXPERIENCE IN TKA (SIGNATURE SYSTEM)

- 60 knees up today
- 44 patients (44 legs) in actual follow up
- 20 males, 24 females
- Using of Vanguard ROCC prosthesis
- The average operative time was 46 minutes
- Perioperative blood loss averaged 100 cc
- There were no intraoperative complications

SIGNATURE SYSTEM ADVANTAGES

- Direct correlation between mechanical axis, preoperational varus and recommended distal valgus .
- Demonstration of satisfactory components position
- No infection
- Lesser perioperative blood loss
- Signature System is a new interesting instrument for accurate bone resection and restoration of alignment.



CONCLUSIONS

- Good and excellent clinical and radiological results of these series are comparable to outcomes achieved by cemented TKA
- The pain relief and restoration of function assessed clinically and by improvement in knee score
- Further long-term follow-up is still required, however, to maintan the efficacy of uncemented TKA

THANK YOU FOR YOUR ATTENTION!