UNICOMPARTMENTAL KNEE ARTHROPLASTY

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INTRODUCTION

Arthroplasty is an excellent therapeutic tool is patients with advanced arthritis of the knee joints. Total knee replacement provides consistent relief from pain and restoration of function. However, not all patients suffering from knee arthritis of any etiology require a total knee replacement. There is a subset of patients who typically present when the degeneration is limited to a single compartment and have significant pain and limitation of activities of daily living. These patients can be managed surgically by a much less morbid but equally successful surgery- the partial knee replacement.

This concept is not new and is the logical evolution of meniscal arthroplasty used since 1976. The partial knee replacement or unicompartmental arthroplasty (UKA) implants basically have a metal femoral component for one condyle, a metal base plate for one tibial condyle and a polyethylene insert which may or may not be fixed to the base plate. UKA has several advantages over a total knee arthroplasty. However, there are certain caveats. This section deals with the nuances of a unicondylar arthroplasty with emphasis on indications and surgical technique.

TYPES

Based on which side of the joint is being replaced, there are two types:

1. Medial UKA
2. Lateral UKA

The difference between the two is not just about the joint area being resurfaced. There are two fundamental differences between a medial and lateral UKA. Firstly, the lateral femoral condyle has greater degree of roll back during flexion. Secondly, the lateral ligaments have greater laxity than the medial collateral ligament during adductor moment of the knee. These factors cause greater complications and lesser longevity of lateral UKAs compared to medial UKAs.

Based on the kind of articulation bearing, there are 2 types:

1. Fixed bearing
2. Mobile bearing

This is a biomechanically more important classification. Basically, the polyethylene insert may either be fixed to the tibial base plate or mobile. This is the essential difference between various UKA implants currently available. A mobile UKA more closely approximates normal knee kinematics, has lesser poly wear rates, is associated with significantly lower radiolucent lines on radiographs and has longer implant survival. However, mobile bearings are associated with a typical problem of bearing dislocation, is less

forgiving to surgical errors and has a steeper surgeon learning curve. It is yet to be established if clinical outcomes of fixed bearings are inferior to mobile bearings in a high level study.

INDICATIONS

The arthritis must be confined to one compartment only for suitability for unicondylar arthroplasty. Results of early UKAs were disappointing because the patient selection was inappropriate. Since medial arthritis and hence, medial UKA is far commoner, it is imperative to discuss this in detail.

There are 2 specific indications for medial UKA:

1. Anteromedial osteoarthritis
2. Medial femoral condyle avascular necrosis

Amongst these 2 also, the results after anteromedial osteoarthritis (AMOA) are quite different from those after AVN. Anteromedial wear indicates that the anterior cruciate and medial collateral ligaments are intact.

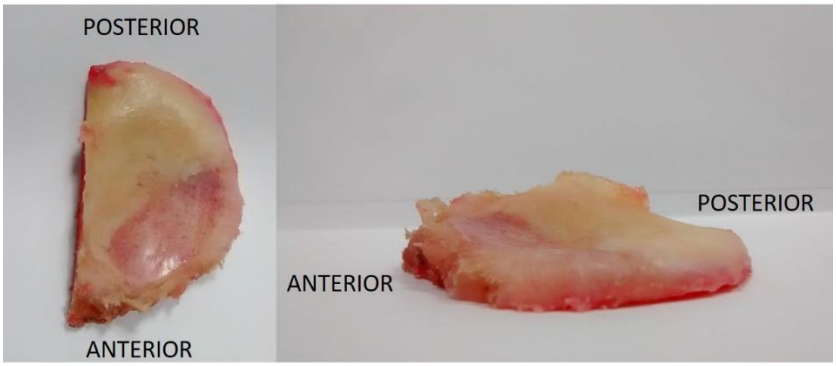

Figure 1: Tibia bone cut demonstrating the typical anteromedial wear pattern.

Besides the wear pattern, the following criteria must be fulfilled for a knee to be suitable for UKA.

a) **Intact cruciate ligaments**: Since the UKA implants are completely unconstrained in the saggital plane, it is essential that the natural ligaments must be intact and functional to achieve stability. Further, ACL insufficiency causes posterior wear on the tibia due to the unrestricted posterior translation and therefore, will not have anteromedial wear pattern.
b) **Medial collateral ligament**: must be intact and not shortened causing varus of >15 degrees and that which is not correctible. Soft tissue release for balancing is never performed and a contracted MCL means the disease has progressed to beyond a stage suitable for UKA.
c) **Lateral compartment:** Must have full thickness cartilage and an intact meniscus. However, Grade I ICRS changes, marginal osteophytes or localized chondral defects at the medial margin (near the notch) are accepted.
d) **Patellofemoral joint:** Erosions and fibrillation in the patellar facets are commonly seen and these areas get unloaded after the surgery. No co-relation has been found between the success of the surgery and patellofemoral arthritis, neither is it a cause of subsequent revision. However, lateral side severe patellofemoral changes are a contraindication.

e) **Flexion deformity:** of >15 degrees is not accepted because the same cannot be corrected by surgery.
f) **Malalignment:** if present, must be passively correctible.

CONTRAINDICATIONS

Presence of some conditions preclude the performance of UKA. These include inflammatory arthritis, crystalline arthropathy, hemophilic arthropathy and neurogenic arthropathy. Besides, absence of any of the pre-requisites of selecting a joint for UKA is also a contraindication.

Advanced age, high body mass index, activity level or presence of chondrocalcinosis are not contraindications for medial UKA.

ADVANTAGES

A UKA provides the following advantages over a Total knee arthroplasty:

1. **Less pain** as the surgery is performed through a smaller incision with lesser soft tissue dissection and minimal bone resection.
2. **Less blood loss and transfusion requirement**
3. **Lesser risk of deep vein thrombosis**
4. **Safer for elderly and cardiac patients**
5. **Rapid mobilization**
6. **Better functional recovery and range of motion.** Patients can easily squat and sit cross leg.
7. **Infection is rare**
8. **Prevents progression of osteoarthritis**

Revision of a UKA is almost like a primary total knee arthroplasty and not a revision TKA surgery.

PRE OPERATIVE PLANNING

A. HISTORY AND CLINICAL EXAMINATION

Patient selection is the key to a successful outcome for UKA. The importance of a careful history and meticulous clinical examination cannot be overstated. The patient's complaint of pain must point towards a unicompartmental pathology. Features of predominant patellofemoral pain e.g. aggravation of pain on walking upstairs or up a slope, must be noted. Also, limitation of activities of daily living to a severity such as to merit surgery, must be understood and recorded. History of subtle trauma or sudden aggravation of pain more likely point towards a meniscal tear, commonly a medial meniscus posterior root tear. Night pain in the knee and pain on terminal flexion or extension are associated with a myxoid cyst of the ACL.

Clinical examination is necessary to look for the following:

i. **Gross effusion and synovitis -** are commonly associated with inflammatory arthropathy.

ii. **Tenderness -** must be localized to one compartment only. Diffuse tenderness is common with tricompartmental disease.
iii. **Deformity assessment** - more than 15 degrees of varus and 15 degrees of flexion deformity are not candidates for UKA as explained in indications.
iv. **Range of motion** - Knee flexion of at least 110 degrees is required to allow preparation of femoral condyle.
v. **Stability** - The ACL must be stable as assessed by the anterior drawer, Lachman's and Pivot shift tests. PCL must be stable as assessed by the posterior drawer test. The medial collateral ligament must not be lax when tested in 0 and 30 degrees flexion.

B. RADIOLOGICAL INVESTIGATIONS

Radiographs: The following radiographs are done, each with a specific purpose

a) Standing scanogram of both lower limbs
b) Anteroposterior standing view
c) Valgus stress view
d) True lateral view
e) Skyline patella view

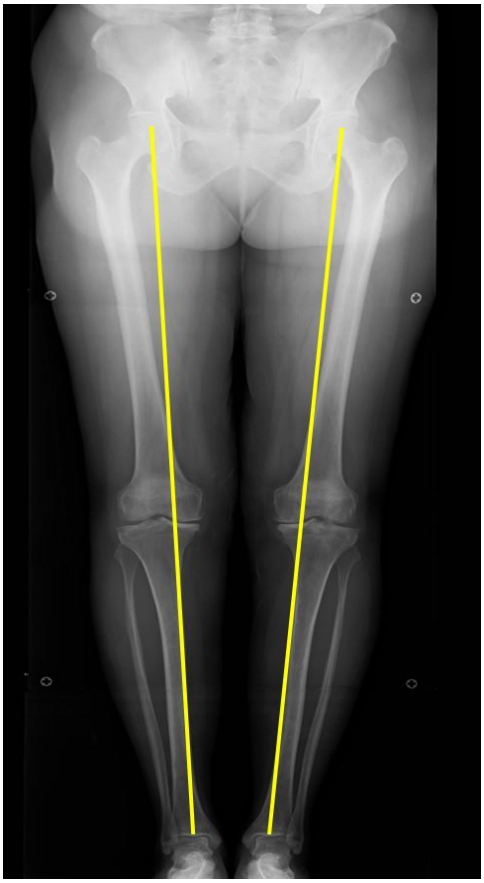

Figure 2: Standing scanogram of both lower limbs. Look for the following-

1. Mechanical axis deviation
2. Extra articular deformity

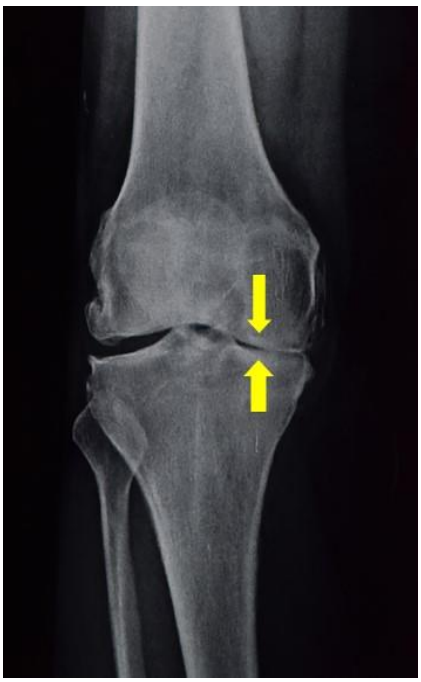

Figure 3: **Standing anteroposterior view**. Look for the following-

1. Medial space loss (Bone on bone)
2. Medial and lateral osteophytes
3. Bone quality

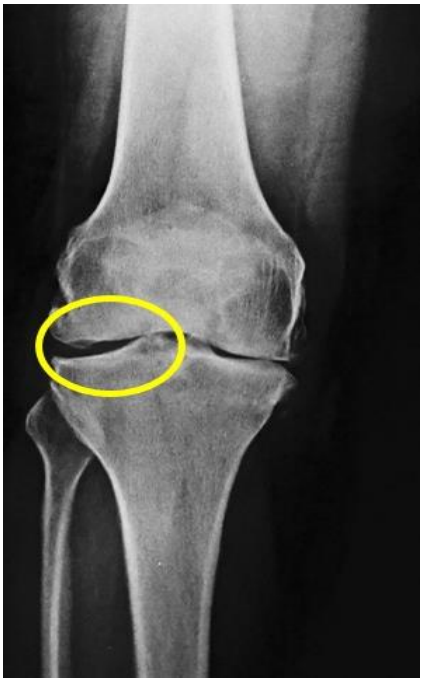

Figure 4: **Valgus stress view**. Look for the following-

1. Whether medial space opens up
2. Whether lateral space is maintained

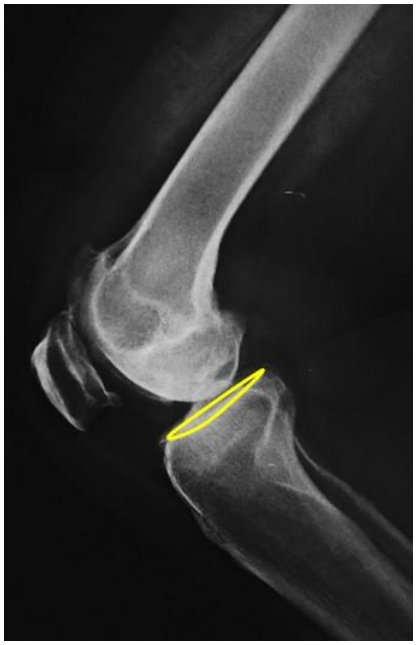

Figure 5: **True lateral view with both condyles overlapping**. Look for the following:

1. Anterior wear of the medial tibial condyle
2. Anvil osteophyte
3. Posterior osteophyte
4. Patella alta / baja

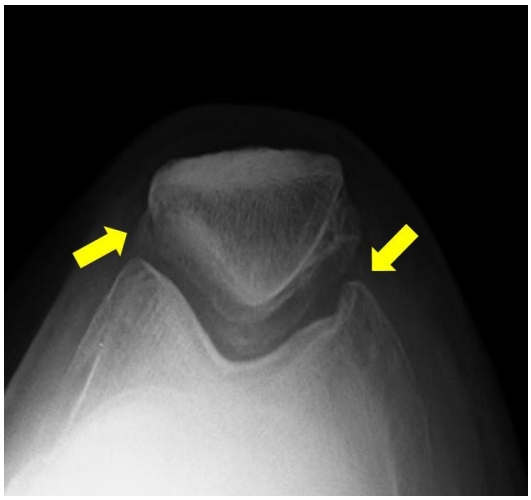

Figure 6: Skyline view of patella. Look for the following:

1. Medial or lateral PF joint wear
2. Osteophytes

SURGICAL TECHNIQUE FOR MOBILE BEARING UKR (OXFORD® MICROPLASTY SYSTEM)

Of all the various UKA implants available today, the Oxford UKA system (Zimmer Biomet) is the most unique and successful design. The surgical steps described here are specific for this implant.

1. Patient positioning: A high thigh tourniquet is applied. This surgery is typically performed in a "hanging leg" position. The end of the table as broken and a leg holder is applied of the operative leg. Flexion up to 110^0 must be achievable. This position helps distract the joint. The non-operative leg is placed in a lithotomy position (Figure 7). An alternate position is like a TKA with table straight and bumps placed at the table end. The bumps are placed to support the foot with knee flexion at 90^0 and 30-45^0. However, no side support must be used to allow the thigh to be freely abducted and leg to hang free.

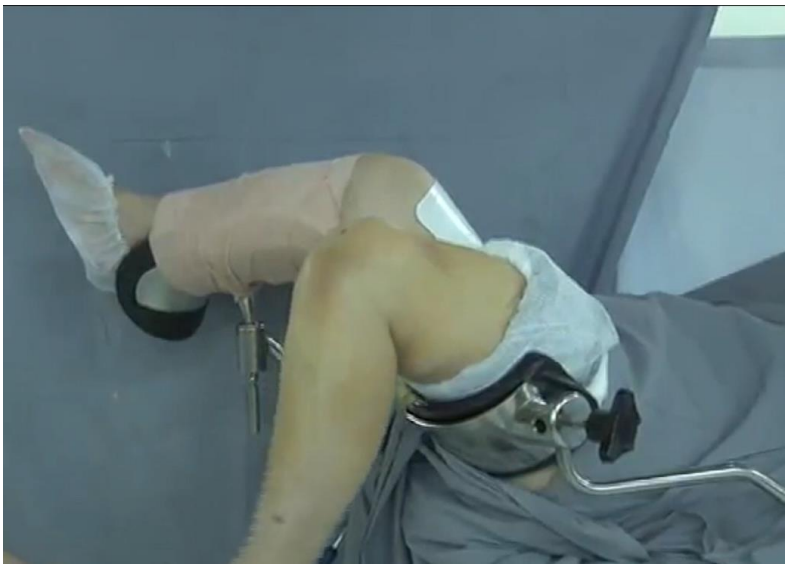

Figure 7: Patient positioned in hanging leg position for left UKA

2. Surgical approach: The entire limb distal to the tourniquet is painted draped free. Skin incision extends from the superomedial corner of the patella to medial to the tibial tuberosity (Figure 8). Limited fasciocutaneous dissection is done. Arthrotomy extends from the superomedial corner of the patella to the tibial tuberosity. About 2 cm. oblique extension in the vastus medialis can be done like a small midvastus approach. The patella maybe displaced laterally but is never everted or dislocated. It is essential to maintain integrity of the synovium in the suprapatellar pouch. The proximal tibia is exposed from the tibial tuberosity to the anteromedial corner. Part of the retropatellar fat pad is excised to improve exposure. At this point, the following are specifically looked for, to determine whether a UKA can be performed, or to switch over to a TKA:

a. Ulcer(s) in the lateral compartment

b. Integrity of the anterior cruciate ligament

c. Severe degeneration of the lateral patellofemoral compartment

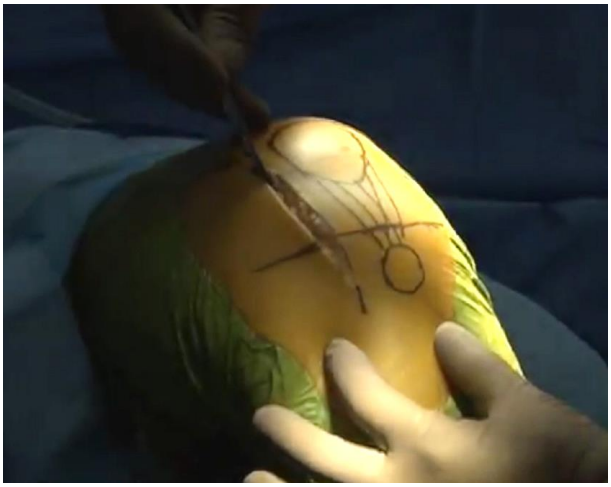

Figure 8: Skin incision for left UKA

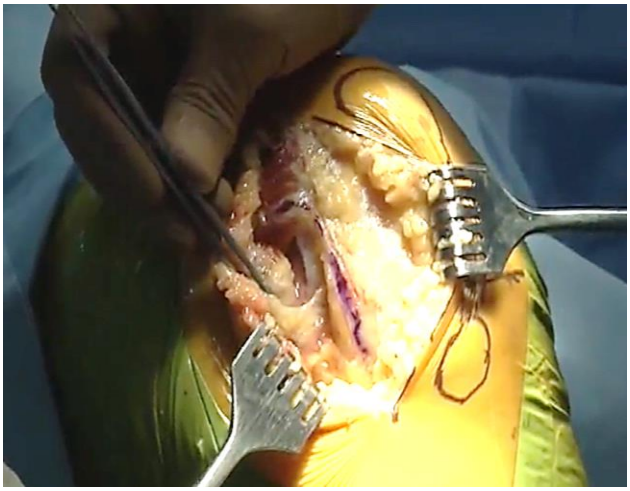

Figure 9: Small mid vastus arthrotomy

3. Osteophyte excision: All osteophytes along the medial margin of medial femoral condyle, on either edges of the intercondylar notch, at the tibial ACL insertion, along the medial tibial condyle and around the patella are excised using a rounger or 6 mm chisel. Osteophytes deep to the medial collateral ligament are carefully removed using a 6 mm chisel. This step relaxes the ligaments and corrects any deformity. No soft tissue release is carried out at all.

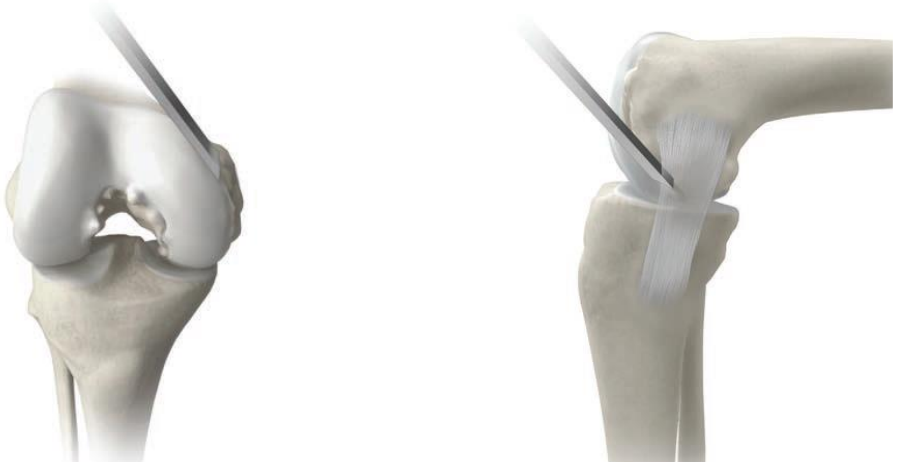

Figure 10: Osteophyte excision from deep to the MCL

4. Femoral sizing and tibial plateau resection: The femur is sized first using femoral sizing spoons. The sizes available are extra small (XS), small (S), medium (M), large (L). This corresponds to the height of the patient. A general guide is as follows:

HEIGHT	**SIZE**
Less than 5 feet	Extra small
>5 feet to 5 feet 6 inches	Small
>5 feet 6 inches to 6 feet	Medium
>6 feet	Large

The femoral spoon is placed centrally and should embrace the medial posterior condyle. There will be a gap seen anteriorly where the eroded cartilage was present. Next, the extramedullary tibia cutting jig is placed and linked to the femoral spoon using the stylus or G clamp. A posterior slope of 7 degrees is built into the system. The cutting jig must sit flush on the tibial condyle and fixed with 1 or 2 pins. A Hohman retractor is placed in the notch and a Z retractor is placed medially to protect the MCL.

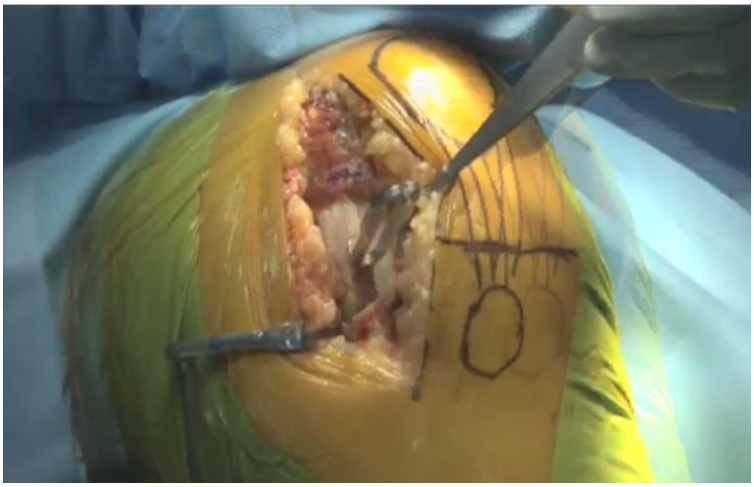

Figure 11: Femoral sizing using the spoon. Note the position of retractors in the notch and to protect the MCL

The saggital tibia cut is first made using a reciprocating saw. The direction of the saw points toward the anterior superior iliac spine and lateral limit is just medial to the apex of medial tibial spine and tibial ACL insertion. The tip of this saw blade is blunt and prevents injury to posterior structures. Advance the saw vertically down till it rests on the superior surface of the saw guide. The hand must not be lifted up while making this cut.

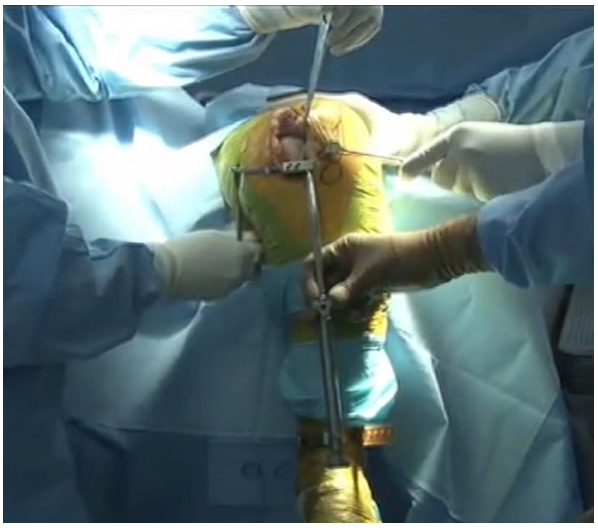

Figure 12: Extramedullary tibia alignment rod placed along the tibia shaft

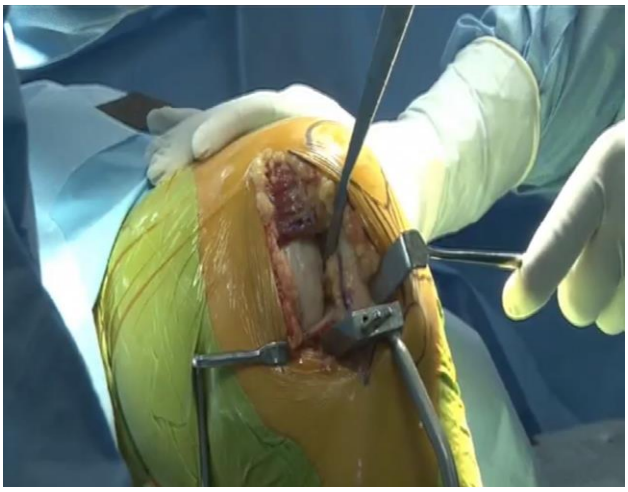

Figure 13: Tibia cutting guide fixed to the bone using 2 pins

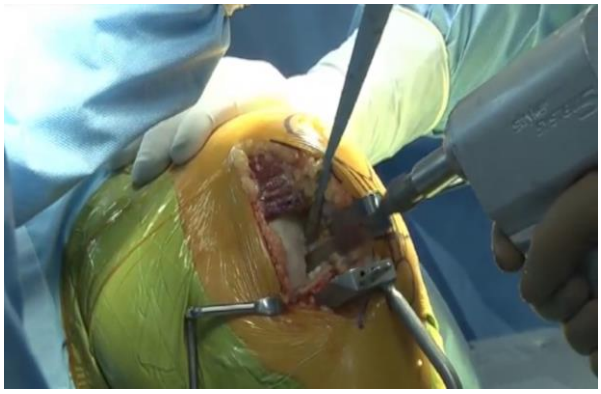

Figure 14: Saggital tibia cut, reciprocating saw directed towards the ipsilateral ASIS

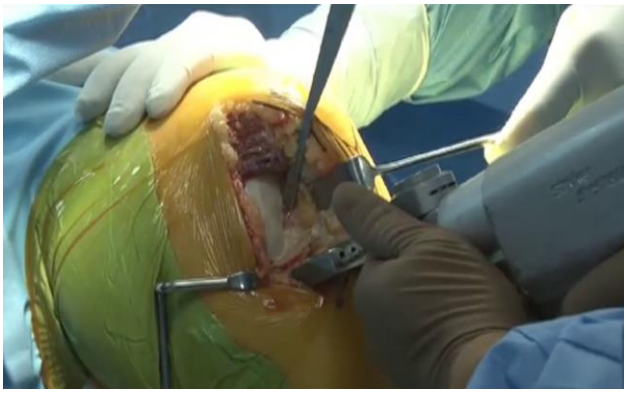

Figure 15: Horizontal tibia cut along the cutting guide. Note Z retractor to protect the MCL

Next, the horizontal cut is made using a 12 mm oscillating saw blade with markings over it. Once the posterior cortex is cut, the tibial biscuit is levered up using an osteotome and freed from soft tissue attachments medially. The typical anteromedial wear pattern is noted. This bone biscuit is used for tibial sizing, using the contralateral tibia template. Anterior to posterior size is determined first and is more critical to avoid posterior overhang. The thickness of this bone cut is determined, which must be at least

4 mm. A tibial template is placed and 4 mm feeler gauge inserted to confirm the same. All retractors must be removed at this time. If the 4 mm gauge is tight, additional 2mm bone is resected off the tibia using the same cutting guide.

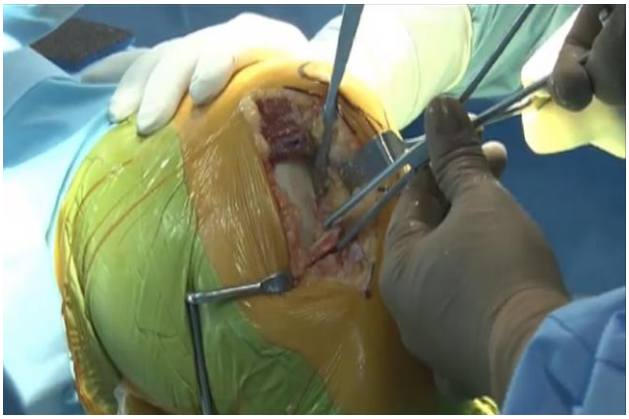

Figure 16: Tibia biscuit removed with a Kocher forceps

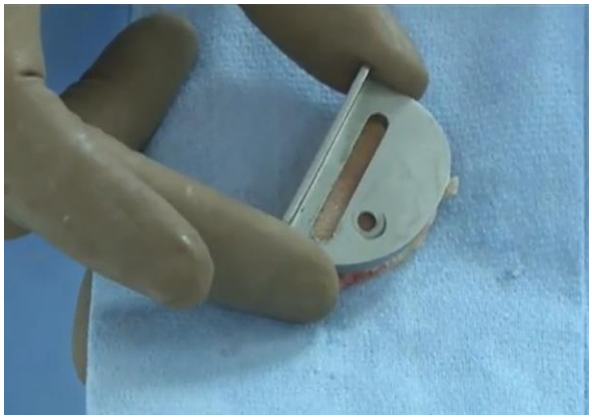

Figure 17: Tibia sizing done using opposite side tibia template

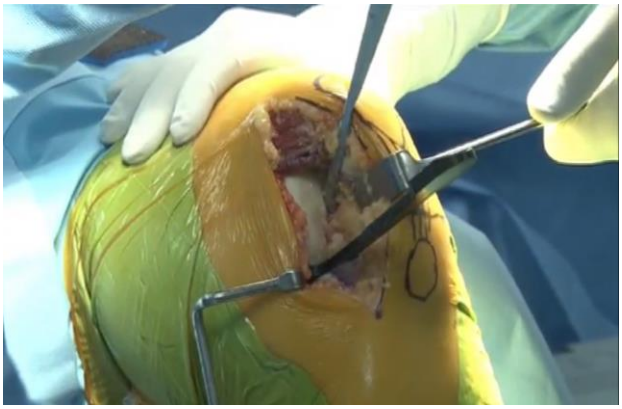

Figure 18: Feeler gauge of 4 mm thickness inserted to confirm that the cut has been of adequate thickness

5. Femoral alignment and drilling: With the knee in 45^0 flexion, the entry point for femur intramedullary (IM) alignment rod is made and entry made using a 4 mm drill. This point is 1 cm anterior to the anterior edge of intercondylar notch and medial to the medial wall. Note that this entry is medial compared to a TKA femur IM alignment rod entry. Intramedullary rod is inserted gently. A marking pen is used to mark the center of medial femoral condyle. Next, insert the femur drill guide set adjusted to the gap in flexion, usually 3 mm. The IM link is next inserted into the IM rod and drill guide. 3 points need to be checked to ensure that the system is placed correctly:

a. The femoral drill guide must be in the center of medial condyle. This is ensured by looking for the marking just made through the 6.35 mm hole.

b. The drill guide must be sitting flush against the femoral condyle

c. The lower foot of the femoral drill guide must be touching the vertical wall of the initial tibial resection.

First, the 4 mm hole is drilled in the upper hole and the drill left in situ. The 6.35 mm lower hole is drilled next.

Figure 19: Entry hole made for femur intramedullary alignment rod

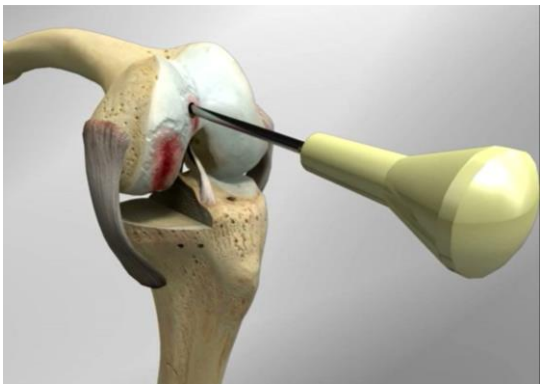

Figure 20: Intramedullary rod inserted using light taps of the palm

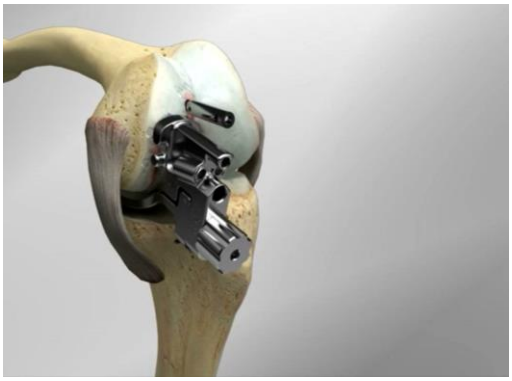

Figure 21: Femur drill guide set placed over the femoral condyle centrally

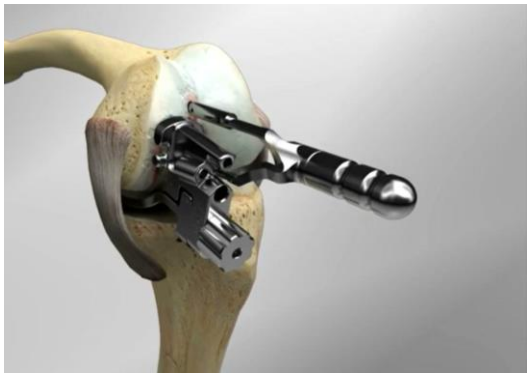

Figure 22: Intramedullary link is inserted into the IM rod and drill guide set

Figure 23: 4 mm hole being drilled

Figure 24: 6.35 mm hole being drilled

The drill and drill guide assembly are removed. The posterior resection guide is inserted into the drilled holes and tapped to seat completely. A 12 mm oscillating saw is inserted in the slot and posterior facet of femoral condyle cut. Care is taken to protect the MCL and ACL. The resection guide is removed. There is now, adequate space in the joint and this opportunity is used to excise the medial meniscus. The entire meniscus is removed leaving behind a cuff of tissue at the menisco-capsular junction to preserve the deep MCL attachment.

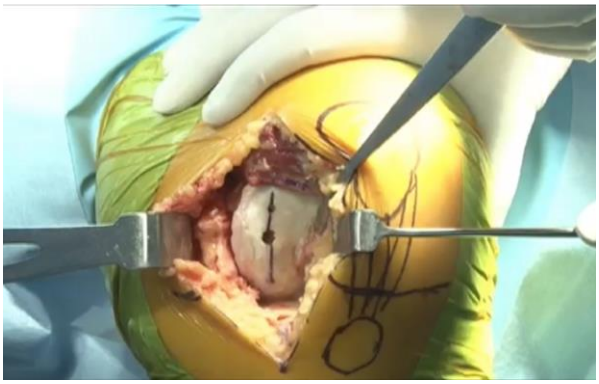

Figure 25: The femoral drill holes aligned centrally in the condyle

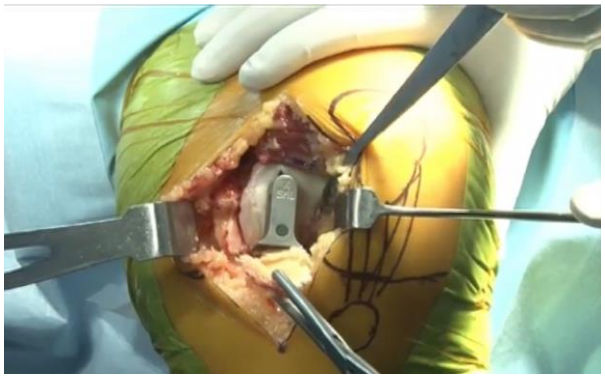

Figure 26: Posterior resection guide in-situ with resected posterior facet of the condyle

6. First milling of femoral condyle: The 0 spigot is inserted and tapped into the 6.35 mm hole. Note that spigots are available from size 0 to 7. The size of the spigot is equivalent to the amount of bone that is milled. Hence, a 3 spigot will remove 3 mm of bone, 4 spigot will remove 4 mm bone. A 0 spigot only shapes the femoral condyle into a sphere without cutting ay bone. The spherical cutter is inserted over the spigot and milling done, pushing firmly in the direction of the spigot axis. There is no danger of over milling due the stop provided in the mill. The mill and spigot are removed and bone protruding at the posterior edge is removed with a rounger.

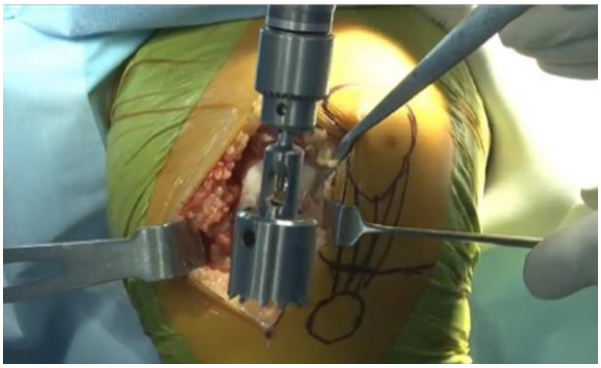

Figure 27: 0 spigot inserted and spherical cutter prepared for milling

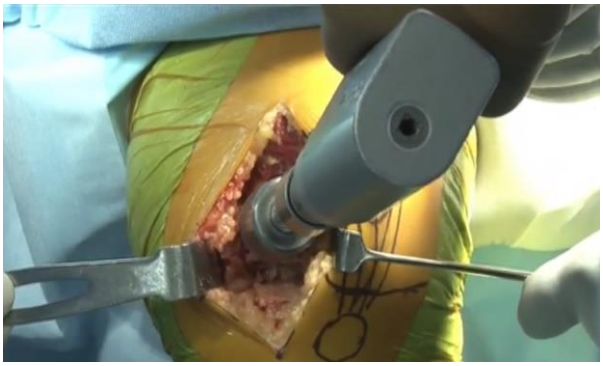

Figure 28: Milling of the femoral condyle being done

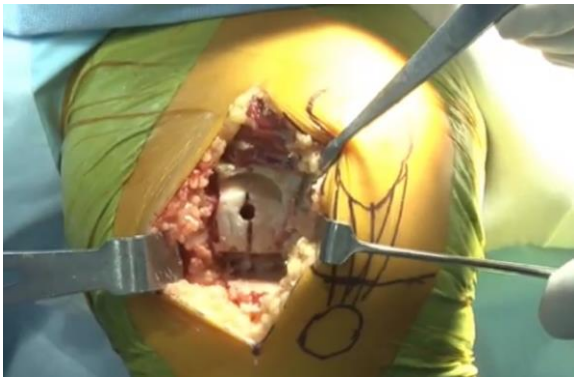

Figure 29: Femoral condyle after first milling

7. Gap balancing: This is a very critical step in this surgery. With the knee in 90^0 flexion, the femoral trial component and tibial templates are applied. Flexion gap is assessed first with a 3 or 4 mm feeler gauge. The thigh must be lifted up and leg allowed to hang freely while this is being done. Serial trials are done. The correct flexion gap is that which allows a feeler gauge of that thickness to slide in and out with a pinch grip but not tilt while inside. Next, the feeler gauge is removed and knee extended to 20^0 of flexion. This is to assess the extension gap. This assessment is not done in full extension because the posterior capsule is tight and gives a false under measurement. The extension gap is checked using gauges. This gap is always lesser than the flexion gap. This difference is calculated.

Flexion gap = x mm

Extension gap = y mm

Difference (Flexion-Extension) = (x – y) mm = Thickness of bone to be milled

Spigot number to be used.

This difference is used to equalize the flexion and extension gaps. A spigot of the measurement of difference is inserted into the 6.35 mm hole and milling is done over it just like the first milling was done. Extra bone at the corners is removed with a rounger or osteotome. With the femoral trial component and tibial template placed again, the flexion (90^0 flexion) and extension gaps (20^0 flexion) are confirmed to be equal. If the extension gap is still smaller than flexion, additional bone is milled from the tibia.

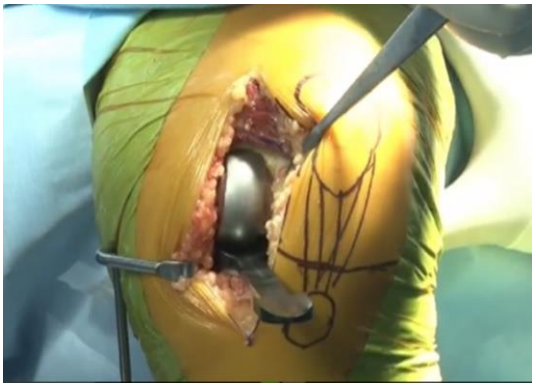

Figure 30: Feeler gauge in 90^0 flexion

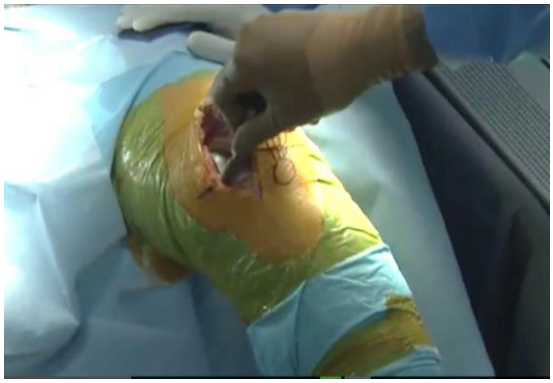

Figure 31: Feeler gauge in 20^0 flexion

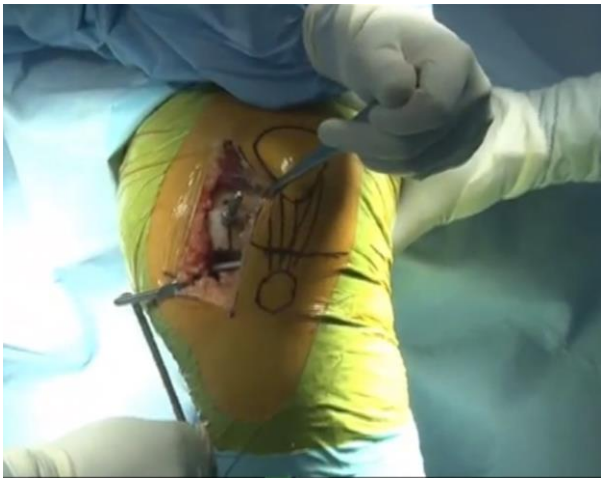

Figure 32: Spigot inserted for milling to equalize flexion and extension gaps

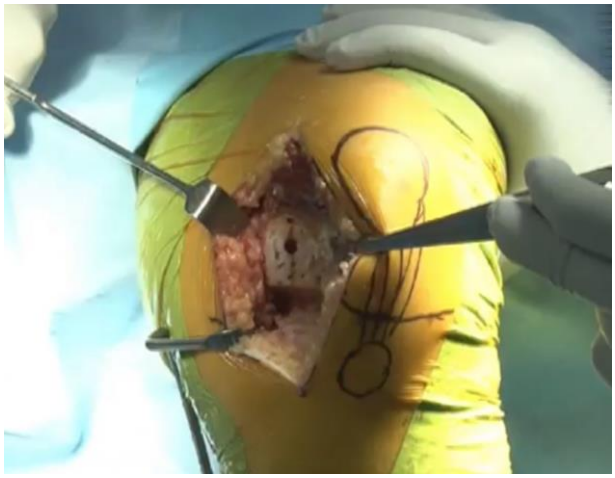

Figure 33: After second milling

8. Impingement milling: Impingement of the bearing can occur anteriorly or posteriorly leading to dislocation. This is prevented by this step. The anti-impingement guide is placed on the femoral condyle. The anterior mill is placed on the peg and milling is done with firm pressure to remove bone anteriorly from the condyle and provides clearance for the front of the bearing in full extension. The osteophyte chisel is then inserted into the slot in the anti-impingement guide. Posterior osteophytes are removed. The guide is removed and confirmation of the bone cuts done. The femoral trial component, tibial template and feeler gauge of appropriate size inserted and knee is taken through a full range of motion, to confirm that there is no impingement.

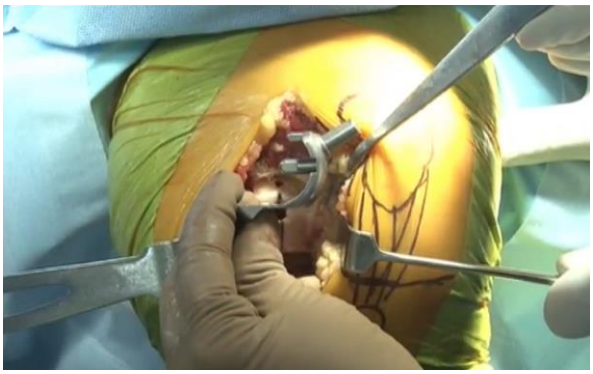

Figure 34: The impingement milling guide

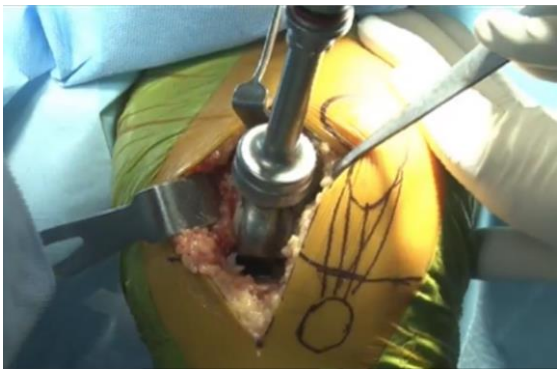

Figure 35: Impingement milling being done using the cutter to remove bone anteriorly

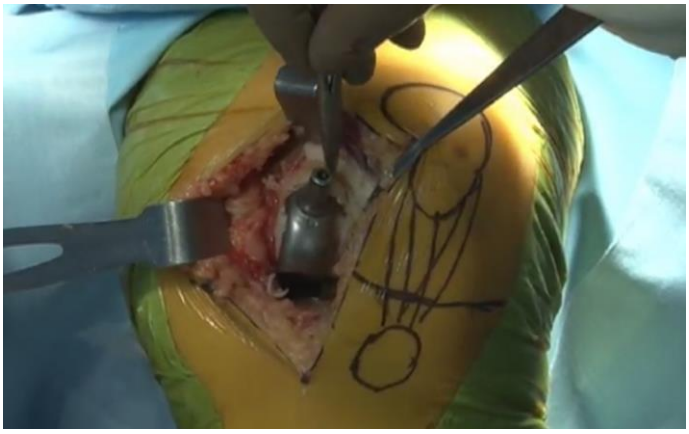

Figure 36: Bone removed anteriorly using the anti-impingement guide is

9. Final tibial preparation: The tibial template of appropriate size is placed and universal hook is passed over the tibia and swept posteriorly to ensure that the tibial template does not overhang posteriorly and pushed laterally to sit flush with the vertical cut. This is then fixed with a pin. The keel-cut saw is the inserted into the slot and tibia is cut from front to back. The template is removed residual bone in the keel groove is removed with the tibial gouge by gently tapping it, without damaging the posterior tibial condyle. The trial tibial component is then inserted and seated completely by tapping with a tibial impactor.

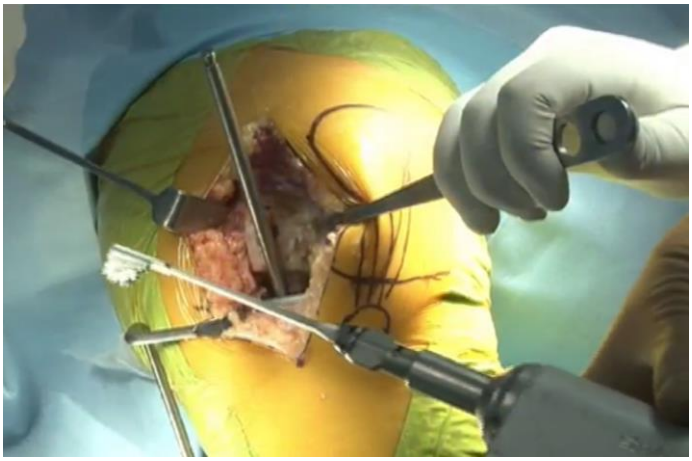

Figure 37: Tibial template fixed with a pin to prepare the tibial condyle.

10. Final trial reduction: The twin peg trial femoral component is inserted and seated completely. Trial meniscal bearing of the measured flexion/extension gap is inserted. Note that the trial meniscal bearing is used for the first time only now. Previously, feeler gauges were used. It is confirmed that the gap is correct and equal in flexion and extension, the bearing is stable, there is no impingement and range of motion is full. The bearing and trial components are removed. Pericapsular infiltration can be given at this stage.

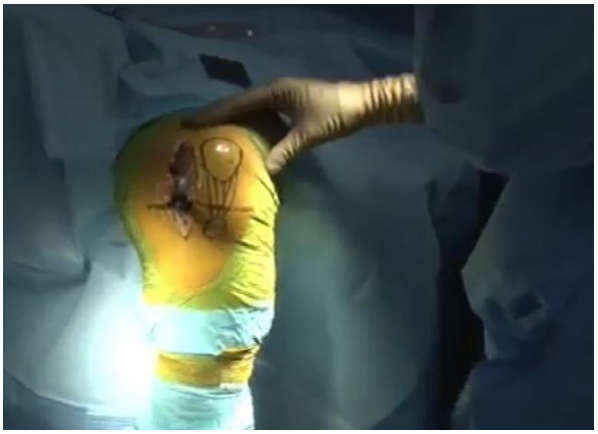

Figure 38: Flexion gap being confirmed

Figure 39: Extension gap being confirmed

11. Cementing the components: Small multiple drill holes are made in the femur for cement penetration. Lavage is given to the bone surfaces and they are dried. 20 grams of cement is sufficient to fix both components. Tibial component is cement first. A thin layer of cement is placed and spread all over. Cement is applied to the keel, base and vertical wall of the tibial plate and inserted into the slot, first posteriorly and then anteriorly. Care is taken to prevent posterior overhang. The tibial impactor with a small mallet are used to completely seat the component. Extra cement from the edges is removed using a Woodson cement curette.

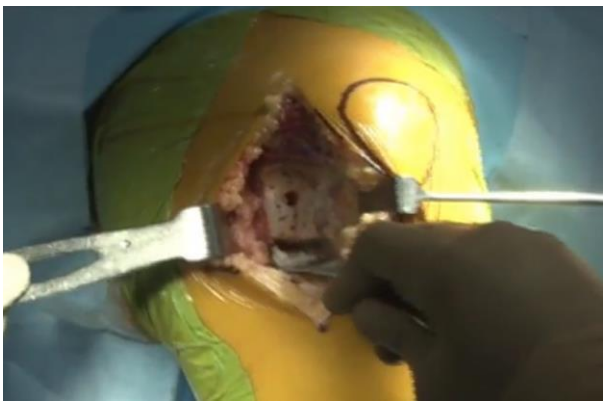

Figure 40: Cement applied over the tibia

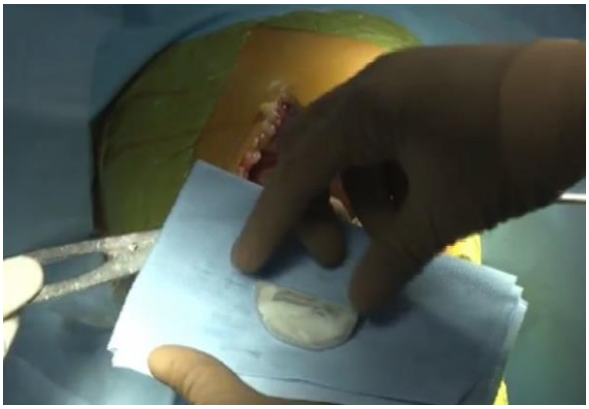

Figure 41: Cement at the underside of tibial base plate

The femoral component is cemented next. Cement is pushed inside the 6.35 mm hole and pressurized. Femoral component with cement applied on its back side is placed and tapped inside. Extra cement from the edges is removed using a Woodson cement curette. Feeler gauge of appropriate size is inserted and knee flexed to 45^0 to pressurize the cement till it sets completely. Once the cement has set, the feeler

gauge is removed and any residual cement is removed. The trial bearing is then inserted to reassess that the gap. Once confirmed, final bearing of that size is inserted.

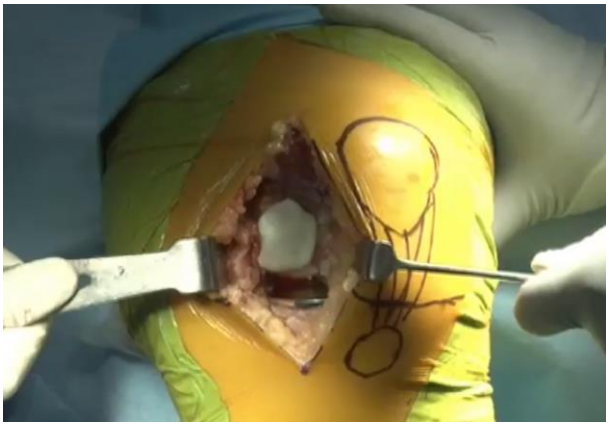

Figure 42: Cement over femoral condyle

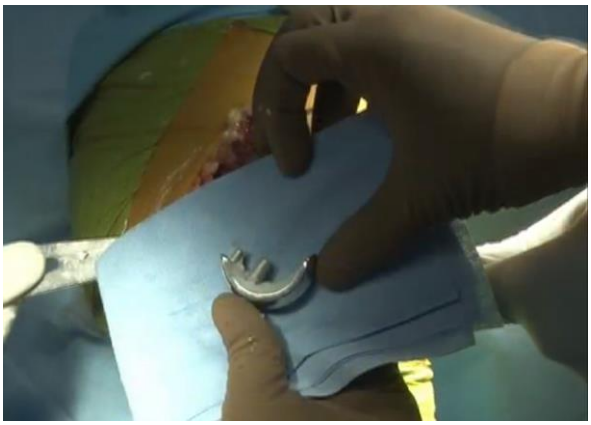

Figure 43: Cement at the underside of femoral component

The tourniquet is deflated and hemostasis is achieved. Tranexaemic acid 2 g. maybe used locally for hemostasis. Drain is usually not required. The arthrotomy is sutured using No. 1 PDS or Polyglactin 910. Subcutaneous layer is sutured using No. 2-0 PDS or Polyglactin 910. Skin is closed using subcuticular absorbable sutures or staples. Non permeable dressing and pressure bandage is applied.

COMPLICATIONS

The complications of UKA are fewer than TKA. The technique dependent complications are more in low volume centers. Some specific complications are as follows:

1. **Infection:** Infection rates following UKA in large series range from 0.1% to 0.5%. This is lower than infection rates following TKA. Infection presents as pain in the operated knee, swelling, erythema, warmth, tenderness, loss of range of motion or fever. Infection maybe early or late. Clinical examination, lab work (Hemogram, ESR, CRP titre, Serum Procalcitonin), radiographs and aspiration of the knee and evaluation of the fluid are used to diagnose an infection.

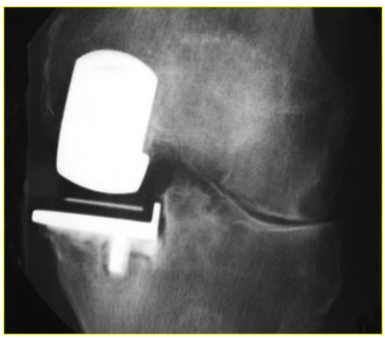

Figure 44: Osteolysis around the cement without sclerosis and change in implant position and lateral compartment space loss are indicative of infection

Early infection is managed with thorough washout and debridement with poly change and intravenous antibiotics. Late infection requires component removal, debridement and one stage or two stage revision to a total knee arthroplasty. When a two stage revision is planned, antibiotic loaded cement spacer must be implanted for the entire joint and not just the medial compartment.

2. **Bearing dislocation:** This is a peculiar problem with mobile bearing UKAs. The poly bearing may dislocate anteriorly to lie in the suprapatellar pouch or posteriorly. The dislocation usually occurs when the limb is non weight bearing and twists. The patient may continue to walk even after the dislocation but with a limp and pain. A radiograph is almost always necessary to confirm the diagnosis.

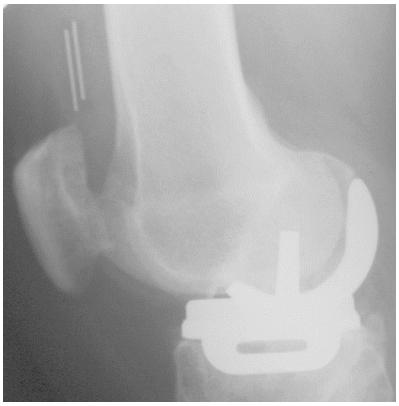

Figure 45: Anterior bearing dislocation

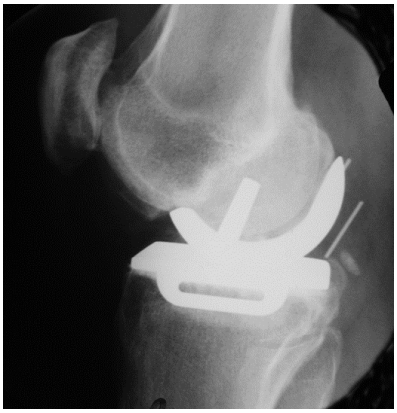

Figure 46: Posterior bearing dislocation

The possible causes and remedial measures are:

CAUSE	**PREVENTION**
Incorrect balance	Careful and meticulous balancing
Stretched ligaments	Don't overstuff the joint
Damaged ligaments	Protects the MCL and ACL
Impingement	Impingement milling, removal of osteophytes and cement
Bearing rotation	Achieve accurate implant positioning

Manipulation under anesthesia to reduce the bearing is rarely successful. Usually, removal of the bearing assessment of cause and placement of the similar or larger bearing is required. Anatomic bearings reduce rotation and are preferred. Rarely, failure to achieve balance may necessitate revision to a fixed bearing UKA.

3. **Tibial plateau fracture:** This is also a peculiar complication of UKA but is very rare. In may happen intra operatively or in the early post-operative period. Patients who are osteopenic or osteoporotic are at a greater risk. While preparing the tibia or cementing, light taps using the mallet provided with the system

must be used. A single headed pin to fix the tibia cutting guide is another safety measure. The keel cut must also not be made very deep and posterior cortex preserved.

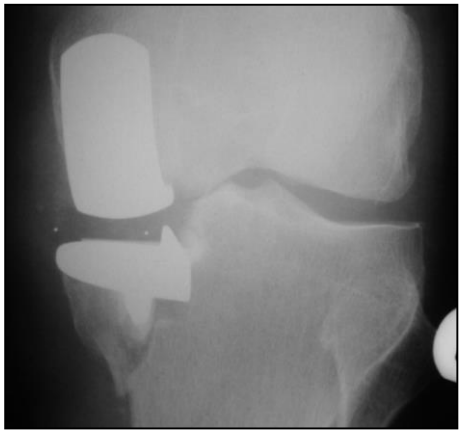

Figure 47: Medial condyle periprosthetic fracture.

When the fracture is displaced, open reduction and internal fixation with plate and screws is needed. However, if the fracture unites in an unacceptable varus position, revision to a total knee arthroplasty is indicated.

4. **Unexplained pain:** Pain is the commonest cause of revision reported in most registries. However, it is seen that revision for pain is often unnecessary and unsuccessful. Unexpected pain is very common when UKA is performed for partial thickness cartilage loss. The exact mechanism is not understood but it is likely that the initial pain itself was not due to the arthritis. Hence, patient selection is critical. Some identified causes of pain include cementing errors, tight flexion gap, impingement, medial overhang, loose bodies and a neuroma. Patients may be investigated to evaluate other sites of pain stimulus like hip or spine. The pain does tend to settle down, sometimes even after 1 or 2 years. Rest and injection of methylprednisolone are useful. Revision is not recommended.

5. **Progression of lateral osteoarthritis:** patient presents after 4-6 years with lateral pain (occasionally medial). This happens if the primary indication itself was wrong or if the joint is overstuffed causing overcorrection. This complication is entirely preventable is patient selection is strict and gap balancing is correct. However, if the lateral compartment is arthritic and painful, revision to a TKA is needed, the rate of which is about 0.7%.

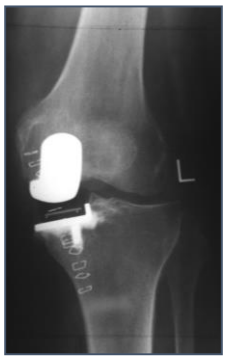

Figure 48: Overcorrection of the deformity leading to valgus alignment.

6. **Loosening:** Mobile bearing UKAs have as low rates of loosening as 0.1% at 10 years. The patients may present with pain or change in gait. Radiographs reveal **component migration** compared to previous radiographs, or **pathological radiolucencies**. Pathological radiolucencies are those which are poorly defined, > 2 mm thick, without surrounding sclerosis and progressive.

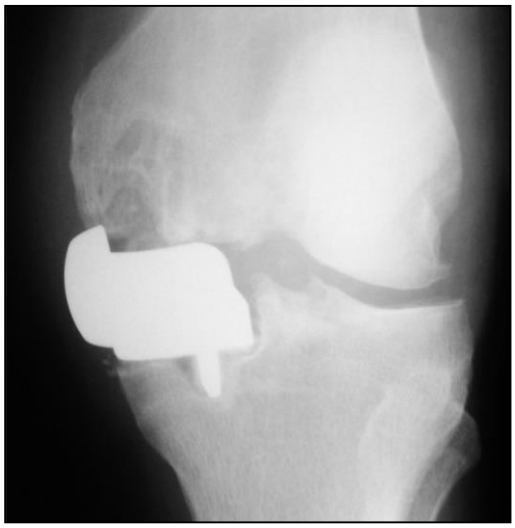

Figure 49: Femoral component loosening with component migration

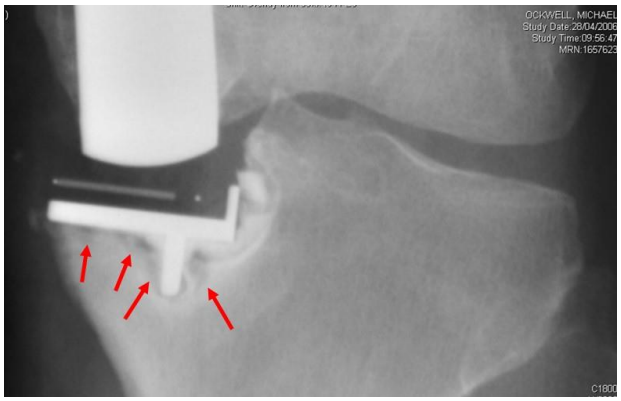

Figure 50: Pathological translucencies around the tibial component

Loosening maybe due to improper cuts, inadequate cementing and inadequate pressurization. Revision to a total knee arthroplasty is the only remedial measure. This can almost always accomplished with a primary TKA implant. Bone defects maybe present in the tibia but are typically contained and small, to be managed with cementing or bone grafting. Rarely, revision using intramedullary stems and wedges maybe needed.

POST OPERATIVE REHABILITATION

Assistance of a walking aid like a walker are needed for 2-3 days only. Patients who undergo a UKA generally do very well in the early post-operative period and do not require prolonged therapist supervised rehabilitation. Few sessions to teach static quadriceps and hamstring exercises, ankle pumps, hip stretches, and commode training are adequate. Strengthening using resistance bands are done later.