Posterior-Stabilized Total Knee Arthroplasty: Short Term Clinical and Radiological Outcome

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ABSTRACT:

BACKGROUND:

To prevent posterior subluxation of the tibia and to improve range of motion and stair climbing ability, total knee prosthesis was modified to the posterior stabilized (PS) one in 1978 and further modifications followed. The Knee Society in 1989 introduced a rating score for TKA named the Knee Society Score (KSS), it's widely used and revised in 2012.

OBJECTIVE:

To study the clinical and radiological results of PS/ TKA.

PATIENT AND METHOD:

We prospectively studied 30 patients with PS/TKA. The mean age was 63 years and mean follow-up was 12 months, 24 knees had osteoarthritis (OA) and 6 knees were rheumatoid (RA). All were unstable and malaligned. The results assessed using the scoring system of Insall et al. and the KSS. Postoperative radiological assessment performed using weight-bearing AP and supine lateral radiographs.

RESULTS:

At last visit, 9 knees (30%) had excellent result, 18 (60%) had good result and 3 (10%) had fair result. The mean KSS improvement was from 31 points preoperatively to 89 points postoperatively. The mean ROM (flexion) preoperatively was 68.5^{o} improved postoperatively to 106^{o}. Postoperatively all knees were stable in AP direction only 4 (13.3%) had mild lateral instability. The ideal position for femoral component within (6-10^{o}) valgus was obtained in 24 knees (80%), it was within (0-5^{o}) valgus in 6 knees (20%). In 93% (28 knees) the tibial component were within 2^{o} of varus or valgus, 6.6% (2 knees) was in greater than 2^{o} varus. Knee function score improved from a mean 27.5 points preoperatively to 58 points postoperatively and patients were able to walk more than 500 meters.

CONCLUSION:

PS/TKA increases range of motion, increases joint stability and improved gait. Both OA and RA patients responded well to its use with nearly same end results. We strongly recommend the use of PS/TKA for primary total knee replacement.

KEYWORDS: TKA, Posterior stabilized, KSS (Knee Society Score).

INTRODUCTION:

The posterior-stabilized condylar knee prosthesis is one of the condylar prostheses developed at the Hospital for Special Surgery.[1] It was as a modification of the total condylar knee prosthesis which has been called the "gold standard" for total knee arthroplasty longevity.[2] In 1978, it was first implanted at the Hospital for Special Surgery and recent studies proved its durability, Since then it has undergone many design changes.[3]

Both above prostheses require excision of both cruciate ligaments, however, the posterior-stabilized one is different, It is a "posterior cruciate ligament-substituting" prosthesis, which has a tibial and femoral component articulation, that allows for femoral rollback during knee flexion. This mechanism make it both clinically and mechanically better. The Insall-Burstein I (IB I) was the original posterior-stabilized condylar prosthesis.[4,5]

IB I was introduced to specifically improve joint stability, range of motion, and ability to climb stairs. These goals were achieved through a transverse cam on the femoral component articulating with a central polyethylene post on the tibial component combined with a change in the center of curvature of the femoral condyles allowed for femoral rollback during flexion to improve motion and knee stability.[5]

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A major change to the prosthesis came about in November 1980[6], when metal-backed polyethelene tibial component was used. It was determined that in the all polyethelene type the primary mode of failure was loosening of the tibial component due to poor cancellous osseous support of the tibial tray.[7,8,9,10,11,12]

In 1987, the design was modified to a modular construct to accommodate modular tibial inserts, wedges, stems and augments. This became known as the IB- II prosthesis .[13]

Recent changes in the implant by the original designer, John Insall, have evolved into the Legacy Posterior Stabilized Knee Prosthesis (LPS) and the LPS-Flex (table 1).[14]

Table 1
The Insall Legacy of Total Knee Arthroplasty

Total Condylar Prosthesis 1974 ↓
Insall Burstein Posterior Stabilized Knee All Poly Tibia 1978 ↓
Insall Burstein Posterior Stabilized Knee Metal Backed Tibia 1981 ↓
Insall Burstein Posterior Stabilized Knee II Modular Tibia 1987 ↓
The Legacy Posterior Stabilized Knee (LPS) 1997 ↓
The LPS –Flex 2000

Determining the Clinical and Radiological outcome of TKA

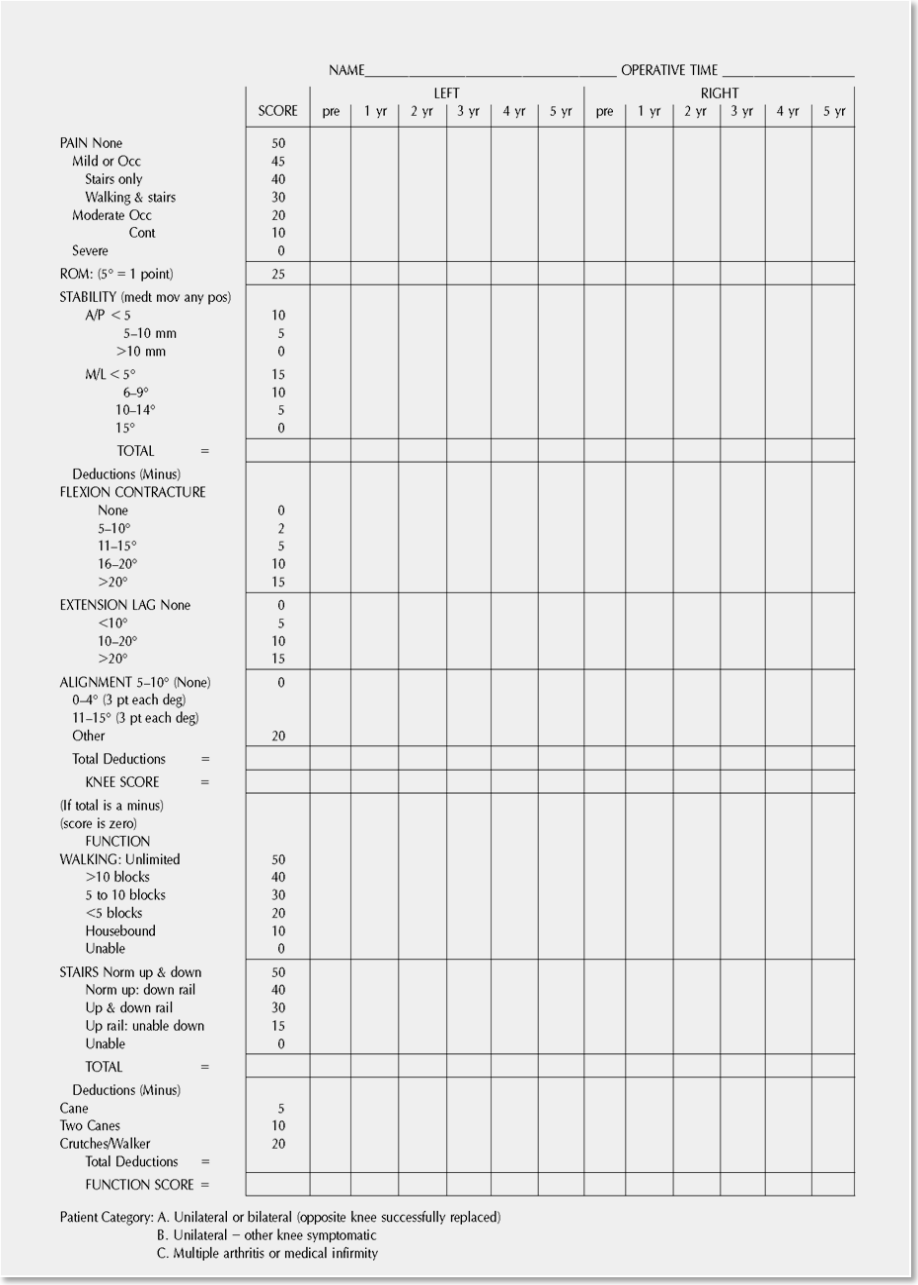
Scoring system

The two most commonly used scores for reporting the results of knee arthroplasty in the medical literature are the Hospital for Special Surgery Knee Score (HSS Knee Score) and the Knee Society Score (KSS). The Knee Society Score can be thought of as a derivation of the HSS Knee Score because it incorporates most aspects of the HSS Knee Score and it was created at a later date.[4]

The Knee Society Score

In 1989, the Knee Society introduced a new rating score for total knee arthroplasty. The Knee Society Score (KSS) added an instability evaluation in the anteroposterior plane and a classification system for patients with associated medical conditions, it is divided into three sections, the Knee Score (100 points), the Knee Function Score (100 points), and a patient classification system. Knee initially valued at zero, and points are awarded or deducted according to different criteria all are shown in (figure 1).[4]

The KSS has been revised in 2012 and presented in new name " The New Knee Society Knee Scoring System" for pre and post-operative assessment. [15].



NAME_____ OPERATIVE TIME _____

	SCORE	LEFT pre	LEFT 1 yr	LEFT 2 yr	LEFT 3 yr	LEFT 4 yr	LEFT 5 yr	RIGHT pre	RIGHT 1 yr	RIGHT 2 yr	RIGHT 3 yr	RIGHT 4 yr	RIGHT 5 yr
PAIN None	50												
Mild or Occ	45												
Stairs only	40												
Walking & stairs	30												
Moderate Occ	20												
Cont	10												
Severe	0												
ROM: (5° = 1 point)	25												
STABILITY (medt mov any pos)													
A/P < 5	10												
5–10 mm	5												
>10 mm	0												
M/L < 5°	15												
6–9°	10												
10–14°	5												
15°	0												
TOTAL =													
Deductions (Minus)													
FLEXION CONTRACTURE													
None	0												
5–10°	2												
11–15°	5												
16–20°	10												
>20°	15												
EXTENSION LAG None	0												
<10°	5												
10–20°	10												
>20°	15												
ALIGNMENT 5–10° (None)	0												
0–4° (3 pt each deg)													
11–15° (3 pt each deg)													
Other	20												
Total Deductions =													
KNEE SCORE =													
(If total is a minus)													
(score is zero)													
FUNCTION													
WALKING: Unlimited	50												
>10 blocks	40												
5 to 10 blocks	30												
<5 blocks	20												
Housebound	10												
Unable	0												
STAIRS Norm up & down	50												
Norm up: down rail	40												
Up & down rail	30												
Up rail: unable down	15												
Unable	0												
TOTAL =													
Deductions (Minus)													
Cane	5												
Two Canes	10												
Crutches/Walker	20												
Total Deductions =													
FUNCTION SCORE =													

Patient Category: A. Unilateral or bilateral (opposite knee successfully replaced)
B. Unilateral – other knee symptomatic
C. Multiple arthritis or medical infirmity

Figure 1:The Knee Society Score [(4)].

Radiological Score

In 1989, the Knee Society introduced the Total Knee Arthroplasty Radiographic Evaluation and Scoring System (Figure 2) to standardize the radiographic parameters to be measured when reporting radiographic outcomes of TKA, as follows: component alignment; tibial surface coverage; radiolucencies; and a patellar problem list that includes angle of the prosthesis, eccentric component placement, subluxation, and dislocation.[(16)]

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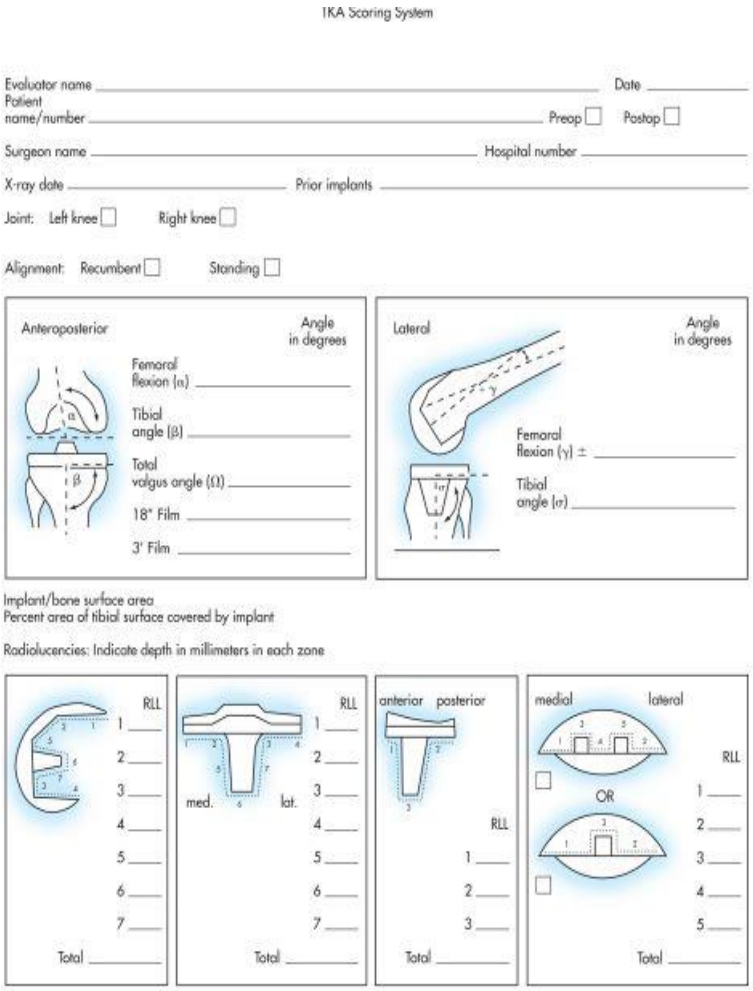

Figure 2: Knee Society radiographic evaluation and scoring system. [16]

Failure mechanisms of TKA

Aseptic loosening

Lewis introduced two main hypotheses, mechanical and biological to explain the loosening of cemented components.[17]

Mechanical loosening may ensue from the degradation of the mechanical properties of the cement or possible third- body wear from cement debris and deterioration of the bone-cement interface.[18]

Biologically, the bone-cement interface is always populated with macrophages, and these cells, possibly activated by motion or unacceptable stress leading to cell death, may initiate osteoclastic activity and destroy precisely the bone to which the implant is bonded.[17] The magnitude of this problem has been greatly reduced by modification of the tibial component to incorporate metal backing and improved coverage of the tibial surface by the implant.[19,20]

Component wear and osteolysis

Host response to particulate debris is known to be a key factor in the genesis of osteolytic lesions. It's a cause of late aseptic failure of cemented arthroplasties[19], it frequency occurs in well-fixed cemented implants.[21] Wear of polyethylene have been documented as long-term problems since the early 1980s; wear debris has rapidly emerged as the major culprit.[22]

Tibiofemoral instability

Wang and Wang (1997) identified two patterns of sagittal plane instability: one with posterior translation of the tibia, occurring in the postoperative period and mostly resulting from a

trauma, the other with anterior translation of the tibia, occurring 6 months to 7 years postoperatively without preceding trauma. Angular errors can lead to chronic attritional incompetence of the supporting ligamentous structures.[23]

Instability may result from surgical errors in bony resection of the femur and an excessive posterior slope of the tibia may also lead to a similar instability pattern.[24]

Fractures

Fracture following a total knee arthroplasty is a complication almost invariably necessitating revision.[25] One prominent factor influencing the rate of femoral component fractures is component size, smaller implants being found to fracture much more often than larger ones.[26]

Patella-resurface or not?

Although the success of knee arthroplasty has improved dramatically over recent years , patellar articulation remains a frequent source of complications.[27] The need to resurface the patella remains controversial. Without patellar resurfacing postoperative patellar or retropatellar pain has occured in 26% of cases as compared to 8% in arthroplasties with patellar resurfacing.[28] On the basis of this observation, patellar resurfacing was recommended. Without patellar resurfacing residual patellofemoral symptoms have been reported in 16-30% of patients.[29]

Patellar fractures

Patellar fractures after TKA are uncommon, causative factors are many some related to the bone, the surgery or mechanics.[29] However, patellar complications in general are on average more common in younger and heavier patients.[30]

Patellar instability

Patellar subluxation or dislocation has been related to inadequate soft tissue balance or a rotational malalignment of the tibial or femoral components.[4, 31]

Infections

Deep infection must always be suspected in the presence of prosthetic loosening, especially if the loosening is gross and the knee undergone previous surgery. Once a joint infection has occurred, it may present a major clinical problem. The two major categories are early (acute) and late sepsis, the latter being subdivided into two further categories, those with draining sinuses and those without.[32]

Clinical symptoms and factors related to failure of TKA

Pain.

It has been estimated that 80% of individuals over 55 years of age have degenerative arthritis of the knee and that 10% have pain which limits activity.[31] It is not clear why some have more pain than others. Pain is a subjective sensation, the severity of which may not relate directly to the apparent cause.[33] Preoperatively, patients with varus alignment usually complain of pain, Postoperatively, pain has been associated with infections, loosening, reflex sympathetic dystrophy and occasionally litigation . In the case of total knee replacement, pain of patellar origin is usually held as a distinct pain type, described as retropatellar or anterior knee pain.[34]

Range of motion (ROM)

In general, although the principal movements of the knee are flexion and extension, significant rotation and lateral movement also occur. In the normal knee some posterior rollback of the femur occurs as the knee flexes, and the instantaneous center moves back and forward some millimeters.[35]

One of the primary goals of TKA is the restoration of a painless, functional range of motion. After arthroplasty, the range of motion can be adequate for good function yet not the same as normal. The most important determinant of postoperative ROM is the range prevailing before arthroplasty.[4,36]

Flexion deformity

Fixed flexion contracture (FFC) is among the most challenging of total knee arthroplasty situations. Its due to a complex combination of ligamentous, capsular and bony deformity. It reduces the femorotibial weight- bearing surfaces and concentrates stress posteriorly.[4,37] Greater flexion deformity has been shown to have an adverse effect on knee Function.[36] A correlation has also been found between pain and residual flexion contracture after total knee arthroplasty.[34]

Lower extremity alignment

Logical surgery of the arthritic knee must aim at restoring an equilibrium between the mechanical stresses in the knee joint and the resistance of the tissues. Correction can be accomplished by adequate soft-tissue release and precise insertion of the prosthetic components. An exact correction of varus or valgus deformity would restore the anatomic shape and also the mechanical conditions which caused the disease to appear and to develop[38], Hungerford and Krackow hold that error in the valgus direction is better tolerated than varus deformity.[39]

Other factors

Age groups, activity level and other factors have been incriminated.[40]

Radiographic factors related to failure of TKA

Radiographic alignment

It is generally agreed that the best way to evaluate the lower leg alignment is to obtain a whole-leg anteroposterior radiograph with the subject in standing position.[41,42] Anatomic and mechanical axes of the femur and tibia can be drawn from the radiograph and alignment of the lower extremity measured.[28]

The inclination angle of the femoral component is formed with the anatomical axis of the femur, the ideal angle is between 6-10 degree valgus. The inclination angle of the tibial component is formed with the mechanical axis of the tibia, the ideal angle is 90 +/- 2 degree.[43]

Radiolucent lines

The incidence of visualization of radiolucent lines at the cement-bone interface after TKA varies with different reported series and different prostheses from 18% to 96% of patients.[16] A number of theories proposed to explain the radiolucency; among those factors are poor cement packing, implant design, motion of the prosthesis before the cement is fixed, interposition of blood between cement and bone, foreign body reaction to the cement, osteonecrosis due to the exothermic reaction of the cement and others.[34] The size of the radiolucent lines, however, has been correlated to substantial and progressive migration.[16] Improper alignment after TKA specially varus has been shown to lead to the emergence of radiolucent lines.[44]

It is generally agreed that the relationship of radiolucent lines to loosening rates is dependent on their width and extent.[45] In asymptomatic patients the lines are usually thin, 1 mm or less in width. Radiolucent lines wider than 2mm at the cement-bone interface should be considered radiographic evidence of loosening.[16]

PATIENTS AND METHOD:

A prospective study from January 2010 to June 2011 of 30 patients who underwent PS/TKAs. They were 12 (40%) males and 18 (60%) females, the mean age of the patients at operation was 63 years range (49-75 years) and mean short term follow-up was 12 months range (3-18 months).

The causative disease was osteoarthritis (OA) in 24 knees (3 post-traumatic) and the other 6 knees were rheumatoid arthritis (RA) after remission.

All (30) knees were unstable, 6 in anteroposterior direction (assessed by allowing the examiner to place a posterior force on the tibia in different positions) and 14 in mediolateral direction (measured by the maximum degree of alignment change to varus/valgus stress) and 10 knees with anteroposterior and mediolateral instability. Malalignment deformities were 23 knees varus and 7 knees valgus. The mean ROM (flexion) preoperatively 68.5º (range 45 -100º) and extension lag (5-15º) mean 8º preoperatively.

The operations performed by two different surgeons, all under general anaesthesia, supine position, pneumatic torniquet to the upper thigh with flexion of knee to allow lengthening of quadriceps muscle, and after preparing and draping the TKA done through anterior midline skin incision and medial parapatellar arthrotomy. Intraoperative alignment achieved using femoral intramedullary alignment rod and extrmedullary tibial alignment device, rotational alignment achieved using the distal femoral guide. All done together with proper control of the flexion and extension gaps and just adequate mediolateral soft tissue release to ensure good postoperative ROM and stability.

A third generation cephalosporin was given to all patients, starting at the induction of anesthesia and continuing into the postoperative period for 5 days. low molecular weight heparin began 6 hours after the operation and continued for two weeks postoperatively.

Every knee was supported with Robert Jonse dressing in extension for 48 hours, but static quadriceps exercises were started without delay in bed, 2nd. day postoperative all patients encouraged to walk with the aid of walker with partial weight-bearing. The mean length of hospital stay was 5 days.

Full weight bearing was within 2-6 weeks postoperatively according to patient compliance and symptoms.

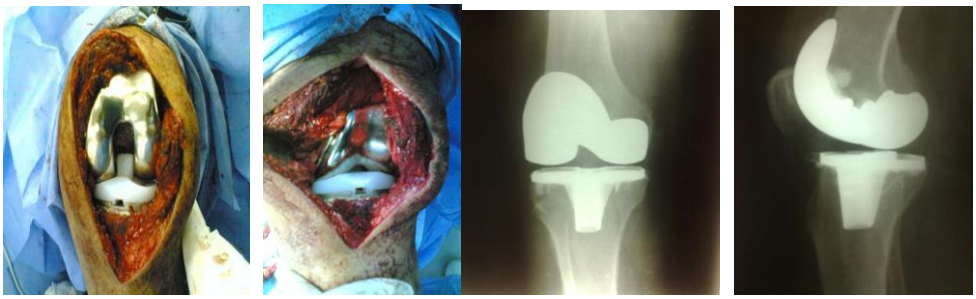

Figure 3: intraoperative photos for a 58 year old patient from our series shows PS prosthesis in flexion and extension during operation and postoperative x-rays

The details of preoperative data are shown in table (2).

Table 2: Preoperative data in 30 knees.

Mean 63 yrs (range 49-75)				AGE
FEMALE	MALE			SEX
18	12			
80%	24 (3 post-traumatic)		OA	DIAGNOSIS
20%	6		RA	
14	MEDIOLAT.	6	AP.	INSTABILITY
10	MULTIDIREC.			
7	VALGUS	23	VARUS	ALIGNMENT

Clinical assessment

Clinical assessment was made preoperatively, 3 months after the operation and at the last visit. The clinical and radiographic results were assessed using the scoring system described by Insall et al. and the parameters described by the Knee Society Score. Knee joint points (50 for pain, and 25 range of motion and stability, respectively) were thus separated from functional points (50 points for walking and climbing stairs, respectively) and deductions were made in the knee joint score for flexion contracture, extension lag and alignment errors and in the knee function score for the use of assistive devices.

Radiographic assessment

Preoperatively, AP weight-bearing radiographs were taken in order to determine lower extremity alignment. Postoperative radiological assessment was performed from weight-bearing AP and supine lateral radiographs taken at every visit. The assessment included the parameters described by the Knee Society Score .

Absence or presence of radiolucencies was noted and their possible progression taken into account.

Tibiofemoral alignment was measured as the medial angle between the distal femoral and proximal tibial anatomical axes.

Prosthesis component position measurements were made using the method of Hood. The ideal position for femoral component was considered to be between 6 and 10 degrees of valgus (96º-100º), with the anterior flange of the femoral prosthesis flush with the anterior cortex. The ideal position for tibial component was considered to be at 90º +/- 2º to the long axis of the tibia in frontal plane.

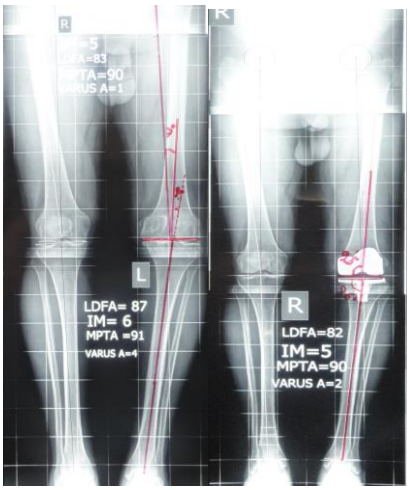

Figure 4: Preoperative and postoperative AP Total leg x-rays for one of our patients showing the measurements

RESULTS:

Results of Knee joint score

Preoperatively: the mean knee joint score was 31 points [OA 49 points, RA 33.5 points] range (25-55 points). The mean preoperative knee flexion was 68.5º [OA 70º,RA 45º] range (45-100º). All patients had painful deformed knees that failed to respond to conservative measures.

Preoperatively, 20% of the knees were unstable in anteroposterior (AP) direction (6 knees), about 47% unstable in the medio-lateral direction(14 knees) and 33% (10 knees) multidirectional instability.

Postoperatively: The mean postoperative knee joint score was 89 points [OA 89, RA 86] range (77-95 points).

Nine knees (30%) had an excellent result, 18 knees (60%) had a good result and 3 knees (10%) had a fair results no poor results (table 4).

Pain was markedly relieved by the operation.

The mean postoperative knee flexion was 106º [OA 110º, RA 90º] range (90 -120º). Extension lag was reduced from a mean of 8º to 3º.

At the last visit all were stable in AP direction by merit of the constrained (posterior) design of the implant. In 4 patients (13.3%) a mild instability was noted in the medio-lateral direction (table 3).

Results of Knee function score

Knee function scores did not improve as clearly as joint scores; still some improvement in function was recorded (table 3).

Preoperatively: The mean knee function score was 27.5 points [OA:26 points/ RA:25 points] range (5-60 points). 80% of the patients were preoperatively required walking aids. Eight of the patients (26%) were preoperatively able to climb up stairs, but were unable to descend.

Postoperatively: the mean function score was 58 points [OA:59 points/RA:55 points] range (45-60 points). Twelve patients used a cane or crutches for walking at the last review. In both OA and RA patients all were able to walk 5-10 blocks (500-1000 meters).

Radiographic results

Preoperatively: most knees were in gross (over 14 degrees) deformity, 77% varus (23/30) and 23% valgus (7/30).

Postoperatively: most (26/30) were in (3-7 degrees) valgus, and (4/30 knees) were in (3-5) degrees varus.

The ideal position for femoral component within 6 -10º valgus was obtained in 24 knees (80%). The femoral prosthesis was within 0 -5º valgus in 6 knees (20%).

In 93% (28 knees) the tibial components were within 2º of varus or valgus, 6.6% (2 knees) were in greater than 2º of varus (table 3).

There were no evidence of radiolucent lines around the femoral component. There were no radiolucent lines beneath the tibial prosthesis in 21 knees (70%), in the other 9 knees (30%) there were incomplete non progressive less than 1mm in thickness lines limited to interface beneath the medial tibial plateau.

A stable radiolucent line of <2 mm is frequent and has no clinical significance they may show within the first year of surgery.

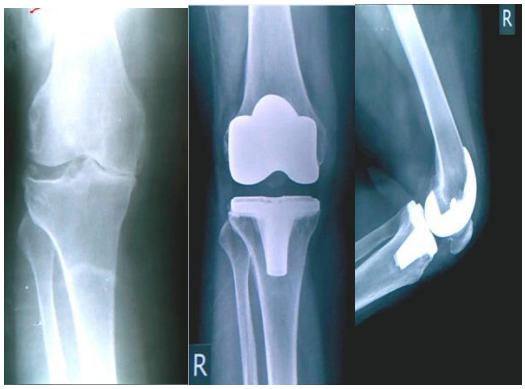

Figure 5: X-rays of 63 years old female with severe OA and varus deformity of the left knee joint we did for her PS/TKR, Preoperative AP view and Postoperative AP and lateral views.

Table 3:Clinical and radiological results of 30 knees replacement using PS/TKAs.

postoperative		Pre-operative		
89 points		31	Mean knee joint score	
58 points		27.5	Men knee function score	
106º		68.5º	mean knee flexion	
3º		8º	Mean extension lag	
0		6	AP	Instability
0		10	Multidirect.	
4		14	lateral	
4 (13%) 3-5 degrees varus		23	Varus	aligenment
26 (87%) 3-7 degrees valgus		7	Valgus	
n = 24	6-10º valgus		Femoral	Component position
n =6	0-5º valgus			
n =2	over 2º varus		Tibial	
n = 28	2ºvarus - 2ºvalgus			
n = 0	over 2º valgus			

Patient satisfaction

Twenty four patients (80%) were pleased or satisfied with result of their knee replacement, 5 patients (16.6%) expressed some limitations about the outcome, and 3.3% (1 patient) was disappointed.

The final clinical results of the patients according to the KSS is shown in (table 4). It was generally seen that no great difference in the results comparing the osteoarthritis to rheumatoid patients.

Table 4: Clinical results in 30 TKA(PS) using The KSS.

Result	Knee joint score	No. of Knee	Percent of knee
Excellent	91-100	9	30
Good	75-90	18	60
Fair	60-74	3	10
Poor	60 or less	_	_

DISCUSSION:

The latest clinical and basic science researches did not support the opinion saying that the retention of the posterior cruciate ligament in TKR would allow better ROM, stability, gait, and enhanced prosthetic longevity. Recently in the United States there is marked increase in the use of PS/TKA for primary TKA that was reflected in the experience of one of the largest orthopedic centers, the Mayo Clinic.[46]

The posterior-stabilized knee prosthesis was originally designed to improve stair-climbing ability, ROM and to prevent posterior tibial subluxation. The posterior sloping of the tibial plateau and the spine-cam mechanism of the PS/TKA enhances the AP stability and provides an increased range of knee motion.[47,48]

In our study, most patients are old age (mean 63 years) with low knee and function scores, they are unstable, malaligened with some flexion deformity. The use of Posterior-Stabilized prosthesis in the treatment of those patients seems to be suitable to solve their complaints and limitations and encouraged us and the patients to do the other side.

Knee Society Score:

In this short term study 90% were excellent or good and 10% had fair results patients were completely relieved from pain with good range of motion and stable functioning knee joint. Despite our short follow up period the results were comparable with those of Insall et al. , who reported 88% excellent and 9% good results using the PS prosthesis at 2-4 years follow up[47]. Still our results may differ on the long run.

Colizza et al. reported 74% excellent , 22% good results, zero fair and 4% poor results using Insall Burstein posterior-stabilized knee at average 10 years follow up.[49]

Stability

In our results all knees were stable in AP direction and only four knees were unstable in the medio-lateral direction. This spine-cam mechanism functions as a mechanical PCL and allows for excision of tight PCL and correction of flexion contracture deformity providing AP stability and good range of femoral rollback without tibial posterior subluxation.

Those four knees (13.3%) were only slightly unstable and possibly because of severe preoperative instability or peroperative excessive soft tissue release and bone cutting, actually it did not greatly affect the end results of function.

Malalignment Correction

One of the objectives of TKA is the re-establishment of normal tibiofemoral alignment.[4,38,42] A valgus aligment of 5-7 degrees is ideal, however, slightly more valgus angulation has no detrimental effects while varus aligment should be avoided.[44] In our study postoperativly 87% of the knees had valgus aligment and 13% had varus. Our results are comparable to those of Hood et al. who reported an overall aligment of valgus in 89% of the knees.[50]

Loosening

Radiolucent lines may be present soon after the insertion of the prosthesis, these are not significant and probably not indicative of loosening. Radiolucencies of more than 2 mm are important only if they span two or more zones and are progressive.[48]

A stable radiolucent line at the cementbone interface of <2 mm in width is frequent and has no clinical significance. Such a line usually appears within 1 year of surgery and then stabilizes.[51]

It is fairly common to see periprosthetic nonprogressive lucent zones at the interfaces on follow-up radiographs in asymptomatic patients that are of no clinical significance.

those can also be seen in a phenomenon known as ‘‘stress hielding.’’ This phenomenon occurs

where bone is resorbed at areas that are no longer subjected to weight-bearing stress following arthroplasty, secondary to redistribution of load and stress. Stress shielding typically occurs within the first 1 to 2 years following TKA on both femoral and tibial sides and it typically remains radiographically stable on sequential examinations.[52]

In this study, and may be because of the short term follow up the radiolucent lines were absent or insignificant, there were no evidence of any radiolucent lines around the femoral component. There were no radiolucent lines beneath the tibial prosthesis in 21 knees (70%), in the remaining 9 knees (30%) there were incomplete, non progressive less than 1mm thickness lines limited to the interface beneath the medial tibial plateau. Insall J et al. recorded nearly similar results in their 2-4 year follow up study as they recorded 32% of non progressive radiolucencies around the tibial component.[5]

Radiographic evaluation of femoral bone-cement lucencies is more difficult and imprecise due to component rotation, which tends to obscure bone-cement interfaces. Femoral loosening with PS/TKA, however, is very uncommon.[2,5,46,53]

Range of Motion

In our study preoperative mean knee flexion was 68.5º (range 45-100º), the mean postoperative knee flexion was improved to 106º range (90 - 120º). Similar results reported by Ranawat et al. they showed an improvement in 96 out of 125 knees with PS prosthesis where preoperative average flexion of 107º range (60-135º) improved postoperatively to an average of 111º range (75-135º).[2]

Wear

Polyethylene wear has not proven to be a major issue in PS/TKA. The PS design includes a conforming tibio-femoral articulation in both the coronal and sagittal planes. This conformity has demonstrated very favorable wear characteristics. At 10-14 years follow-up, Colizza et al. observed no evidence of marked polyethylene wear in a consecutive series of 165 Insall Burstein PS/TKA. In our study no patient underwent revision TKA, however long term flow up is needed to see evidence of wear.[8,9]

Effect of associated disease or trauma on outcome

Early reports suggested that knee flexion increases after TKA in RA but decreases in OA. In 1998 a study of 164 Insall-Burstein posterior-stabilised TKAs evaluated the factors that affect postoperative knee flexion, the mean postoperative flexion was 100° in RA group and 120º in the OA group. Because OA and RA are the predominant knee diseases, one could infer that the OA patients do better than the RA group when the knees are not too stiff before surgery.[54]

In this study we compared the results of patients with RA and OA and we found that the improvement of the preoperative mean knee and function scores was nearly the same postoperatively, we also reported nearly same conclusion regarding improvement of ROM and walking distance.

We believe that both OA and RA patients responded well to treatment with

PS/TKA and improved functionally and we see that both OA and RA patients are good candidate for PS/TKA without clear difference in short term outcome, still these findings may found to be incorrect with longer follow up or when dealing with larger sample. Our previous finding still goes with the results of Larson et al. (2001), Liu and Chen (1998) who found no differences in results of OA and RA.

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