

Role of patella resurfacing in Total Knee Replacement

Naveed Ahmed Jumani¹, Nasir Ahmed², Arslan Ahmed Abro³, Muhammad Kazim Rahim Najjad⁴, Muhammad Mairaj Khan⁵, Nargis Aftab⁶, Azra Maryam⁷, Iqra Laraib⁸.

¹ Dr Naveed Ahmed Jumani
Senior Resident Orthopaedics
Liaquat National Hospital & Medical College
Karachi

Dr.naveedjumani@gmail.com

² Dr Nasir Ahmed
Consultant Orthopaedics
Liaquat National Hospital & Medical College
Karachi

drnasirnh@gmail.com

³ Corresponding Author
Dr Arslan Ahmed Abro
Senior Resident Orthopaedics
Liaquat National Hospital & Medical College
Karachi

arsalanabro@yahoo.com

⁴ Dr Muhammad Kazim Rahim Najjad
Assistant Professor Orthopaedics
Liaquat National Hospital & Medical College
Karachi

kazimnajjad@gmail.com

⁵ Dr Muhammad Mairaj Khan
House Officer
Liaquat National Hospital & Medical College
Karachi

Mairajkhan96@yahoo.com

⁶ Nargis Aftab
Student MBBS 2nd Year
Peoples University Of Medical & Health
Sciences For Women

ashfaqueahmedabro@icloud.com

⁷ Azra Maryam
House Officer
Civil Hospital Karachi
Dha_maryam@yahoo.com

⁸ Iqra Laraib
House Officer

Corresponding Author
Dr Arslan Ahmed Abro
Senior Resident Orthopaedics
Liaquat National Hospital & Medical College
Karachi
arsalanabro@yahoo.com

ABSTRACT

OBJECTIVE: To compare the patella resurfacing and patella plasty in terms of Patellofemoral complications

Method: This is a retrospective cohort study which includes all patients undergoing knee replacement either with patella-plasty or patella being resurfaced. Includes 82 patients who met our inclusion criteria, all surgeries were performed by a single experienced orthopedic surgeon. Cemented press-fit condylar system implant was used. In this study visual analogue score for pain was used, all patients were subjectively asked to describe the pain status. from Jan-2016 to Jan 2018.

Result: Total 82 patients were enrolled in this cohort study. Around 70% patients were females while 30% were males. Mean age was 71 years (range 50-92 years). There was no major dissimilarities noticed in per-operative factors in two groups.

Conclusion: As per our experience, in this study we did not notice any significant difference in knee pain or other patella-femoral complications in both groups.

key words: patella, resurfacing, patellofemoral complication

How to cite this article: Jumani NA¹, Ahmed N², Abro AA³, Najjad MKR⁴, Khan MM⁵, Aftab N⁶, Maryam A⁷, Laraib I⁸. **Role Of Patella Resurfacing In Total Knee Replacement**. JPUMHS:2020;10(02)99-102. <http://doi.org/10.46536/jpumhs/2020/10.02.298>

INTRODUCTION:

The marked beginning of the modern era of knee replacement began in late seventy's of nineteenth century. When new condylar system designs were introduced by insall and others, the patella hemisphere was resurfaced in patellar polyethylene constituent along with a fixation bear in center. Two early complications of this condylar system were noticed which includes subluxation in posterior direction while flexing the knee joint and average restriction upto 90-100 degree of flexion.

Later on in 1978, new designs were introduced, such as posterior cruciate substituting and posterior stabilizing devices, which were efficient and designed in such a way that they allow more flexion and were more stable in femoral rollbacking as compare to previous designs. Most of the current devices are the modification of these designs.

However, after a decade patellofemoral problems were the chief reason for revision

surgeries in these knee replacements so later designs were constructed with special attention to patellofemoral component. Newer designs were reconstructed in such a way that they provide greater contact area and in-corporate patellafemoral component, this leads to reduced chances of patellar subluxation and decreases problems associated with patellofemoral component of implant.

Osteoarthritis (OA) is a commonest condition encountered in elective orthopedics. It is a degenerative process and can affect all synovial joints, most frequently the weight bearing joints such as knee joint. The commonest form of OA is primary due to physiological wear and tear. Secondary OA is caused by trauma especially if joint surface has been fractured. Arthroplasty(joint replacement) is the gold standard and most predictable way of treating advanced OA. In case of knee OA total knee replacement (TKR) has shown to be a effective way in providing functional improvement and pain relief. Different

prosthesis has been used while most commonly used prosthesis is posterior cruciate retraining prosthesis. However, it is debatable to resurface patella or to treat simply with patella-plasty.¹⁻³

In past patellar implants were not specified for resurfacing of patella so those implants were associated with higher patella-femoral joints complications, such as anterior knee pain, dislocation, subluxation and mal-tracking. These problems led to invention of tri-compartmental designs those were specified to permit resurfacing of patella.^{1,2,4}

In literature, some of the studies favours the resurfacing of patella due to its ability to provide better patella-femoral mobility and relieve of knee pain⁵⁻⁷. While some studies have suggested no difference or improvement in knee pain and patella-femoral mobility when compared with non-surfaced patella in knee

replacement⁸⁻¹⁰. Regarding advantages of patella resurfacing, it avoids future concerns about anterior knee pain leading to reoperation and its disadvantages with prosthetic patella are loosening and fractures¹¹⁻¹⁴. In a study resurfacing of patella has shown reduction in rate of revision surgeries (TKR) due to patella-femoral problems up to (2.8%), as compared to studies without patella resurfacing (7.2%).

METHODS AND MATERIALS:

This is a retrospective cohort study which includes all patients undergoing knee replacement either with patella-plasty or patella being resurfaced. All surgeries were performed by a single experienced orthopaedic surgeon. Cemented press-fit condylar system implant was used. In this study visual analogue score for pain was used, all patients were subjectively asked to describe the pain status.

Exclusion criteria: Patients suffering coagulation disorders and severe comorbidities, patients with hip OA or previous arthroplasty, patients with secondary osteoarthritis or other inflammatory conditions such as Rheumatoid arthritis.

Inclusion criteria: Patients presented with advanced osteoarthritis. All patients community ambulant with or without support. Study was approved by ethical committee of institute. Informed consent was taken from all enrolled patients.

Diagnosis: was made on the basis of History, clinical examinations, radiological findings (X-rays, scanogram).

Technique: After aseptic sterility technique. All surgeries were done under combine spinal epidural anesthesia (CSEA). Tourniquet was used as a mandatory tool in all cases. All these surgeries were performed by single experienced orthoscopic surgeon. Approached through midline and medial para-patellar approach was used. Press fit condylar implant was used after confirmation of size by checking with femoral and tibial component trials. Resurfacing of patella was done by using only patella implant, cemented polyethylene, oval-round buttoned with three dowels was used while in another group patella-plasty was performed by removing osteophytes and patellar rim cautery and lateral release. Trial component insertion was used to assess for definitive implant placement. In 41 patients patella was resurfaced and in 41 patients patella-plasty was performed.

Peroperative parameters such as blood loss, time of tourniquet and conditions of articular surface were documented in all cases. Long leg knee Brace applied after surgery and full weight bear mobilization was started on 1st post-operative day. No intraoperative or immediate post-operative complications were noticed. Knee society scoring system is a 100-points scoring system consist of 3 components. (1) pain: which has maximum of 50 points, (2) stability: which has 25 points, (3) range of motion: which has 25 points.

Weight bearing x-rays of knee joints were taken which includes AP-lateral view and sky-line views before surgery and after surgery at 12 weeks and 12 months follow-up. Implant problems such as component loosening, implant wear, patella component wear (non-resurfaced), loosening (resurfaced) was evaluated on these radiographs.

RESULTS :

Total 82 patients were enrolled in this cohort study. Around 70% patients were females while 30% were males. Mean age was 71 years (range 50-92 years). There was no major dissimilarities noticed in per-operative factors in two groups. Values are shown in Table 1.

While table 2 showing the difference of knee society score in both groups before and after surgery.

There was marked improvement in Range of motion in both groups post-operatively, but no major dissimilarities in two groups as shown in table 3.

At 24-months follow-up 4 patients in non-resurfaced group developed anterior knee pain, whereas 1 patient reported such pain in resurfaced group. Patient with pain in resurfaced group had mild to moderate symptoms relieved by analgesia. Four patients with persistent pain in non resurfaced group were managed by analgesia and continued physiotherapy and

after 3-6 months pain clinically improved. In this study none of the patient went for revision surgery for anterior knee pain. In this study none of the patient underwent revision surgery for anterior knee pain and no patients shows signs and symptoms of instability related to patello-femoral component as a contributing factor to knee pain. Table 4 expresses the statistical data.

Table 1.	PER-OPERATIVE PARAMETERS DURING TKR		
	Total Knee Translant with patella resurfacing	Total Knee Translant without patella resurfacing	
Tourniquet time	76.5 min (60–90 min)	70.5 min (58–86 min)	p>0.05
Loss of blood	90 ml (55–115 ml)	70 ml (60–95 ml)	p>0.05
Lateral release	2	5	p>0.05

Table 2.	Pre-operative Knee Society knee score	Knee Society knee score at final follow-up
Knee replacement with patellar resurfacing	42 (35-68)	75(60-90)
Knee replacement without patellar resurfacing	46 (32-70)	68(50-80)
	p>0.05	p>0.05

Table 3.	Pre-operative ROM	Post-operative ROM	
Knee replacement with patellar resurfacing	70(20-140)	110(90-130)	P<0.05
Knee replacement without patellar resurfacing	70(20-140)	100(80-120)	P<0.05

Table 4: At 24-months post-operative follow-up.				
	Total no Of patients	Mild (1-3)	Moderate (4-6)	Severe (7-10)
Knee replacement with patellar resurfacing	41	13	1	0
Knee replacement without patellar resurfacing	41	16	4	0

Discussion:

Total knee replacement is the procedure of choice for arthritic knee in orthopaedic surgery with low complication rate (<5%) in primary situation. Majority of these complications are associated with patella , while patella resurfacing has proved to be the surgeon choice.

The contemporary literature regarding resurfacing of the patella has conflicting conclusions. Barrack et al and Feller et al ^{15,16} did not demonstrate a significant

difference in knee score and anterior knee pain when comparing patients with resurfaced or non-resurfaced patellae. However, Barrack et al. ^{6, 8, 9} stated that almost same experiencing of knee pain after surgery nonetheless; resurfacing of patella was done or not. While Waters and Bentley, Wood et al. and Badhe et al. ^{17, 18, 19} suggested that performing patella resurfacing is associated with better results and suggested that revision surgeries for patella-femoral issues (knee pain , difficulty

in climbing stairs) are less commonly with patella resurfacing.²⁰

Contributing factors are experienced surgeons, variability in prosthetic devices, different surgical techniques, and severity of patella arthritis in different groups of population.

In this study, the contributing factors have been minimized by careful selection of the patients by using press-fit condylar prosthesis and inserted after trials with anatomic femoral and tibial components. All surgeries were performed by single experienced orthoscopic surgeon with same technique.

In this study, limitation was recall bias as patients may have forgotten the scale of pain due to total knee replacement and possibly may have interpreted the higher values.

Conclusion:

As per our experience, in this study we did not notice any significant difference in knee pain or other patella-femoral complications in both groups.

Reference:

1. Insall JN, Ranawat CS, Aglietti P, Shine J (1976) A comparison of four models of knee-replacement prostheses. *J Bone Joint Surg Am* 58:754–765
2. Jones EC, Insall JN, Inglis AE, Ranawat CS (1979) GUEPAR knee arthroplasty results and late complications. *ClinOrthopRelat Res* 140:145–152
3. Boyd AD Jr, Ewald FC, Thomas WH, Poss R, Sledge CB (1993) Long-term complications after total knee arthroplasty with or without resurfacing of the patella. *J Bone Joint Surg Am* 75:674–681
4. Helmy N, Anglin C, Greidanus NV, Masri BA (2008) To resurface or not to resurface the patella in total knee arthroplasty. *ClinOrthopRelat Res* 466(11):2775–2783
5. Garneti N, Mahadeva D, Khalil A, McLaren CA (2008) Patellar resurfacing versus no resurfacing in Scorpio total knee arthroplasty. *J Knee Surg* 21(2):97–100
6. Barrack RL, Matzkin E, Ingraham R, Engh G, Rorabeck C (1998) Revision knee arthroplasty with patella replacement versus bony shell. *ClinOrthopRelat Res* 356:139–143
7. Rand JA (1994) The patellofemoral joint in total knee arthroplasty. *J Bone Joint Surg Am* 76:612–620
8. Barrack RL, Bertot AJ, Wolfe MW, Waldman DA, Milicic M, Myers L (2001) Patellar resurfacing in total knee arthroplasty. A prospective, randomized, double-blind study with five to seven years of follow-up. *J Bone Joint Surg Am* 83:1376–1381
9. Barrack RL, Wolfe MW, Waldman DA, Milicic M, Bertot AJ, Myers L (1997) Resurfacing of the patella in total knee arthroplasty. A prospective, randomized, double-blind study. *J Bone Joint Surg Am* 79:1121–1131
10. Keblish PA, Varma AK, Greenwald AS (1994) Patellar resurfacing or retention in total knee arthroplasty. A prospective study of patients with bilateral replacements. *J Bone Joint Surg Br* 76:930–937
11. Scott RD, Reilly DT (1980) Pros and cons of patellar resurfacing in total knee replacement. *Orthop Trans* 4:328
12. Forster MC (2004) Patellar resurfacing in total knee arthroplasty for osteoarthritis: a systematic review. *Knee* 11:427–430
13. Nizard RS, Biau D, Porcher R, Ravaud P, Bizot P, Hannouche D, Sedel L (2005) A meta-analysis of patellar replacement in total knee arthroplasty. *ClinOrthopRelat Res* 432:196–203
14. Pakos EE, Ntzani EE, Trikalinos TA (2005) Patellar resurfacing in total knee arthroplasty. A meta-analysis. *J Bone Joint Surg Am* 87:1438–1445
15. Edward T. Habermann, MD & Mark Kerner, MD Flexion / Newsletter for Orthopaedic Surgeons; Volume 2~ Number 3 *Patella Resurfacing in Total Knee Replacement: Is it an Option?*
16. Feller JA, Bartlett RJ, Lang DM. Patellar resurfacing versus retention in total knee arthroplasty. *J Bone Joint Surg [Br]* 1996;78-B:226–8.
17. Waters TS, Bentley G (2003) Patellar resurfacing in total knee arthroplasty. A prospective, randomized study. *J Bone Joint Surg Am* 85-A:212–217
18. Wood DJ, Smith AJ, Collopy D, White B, Brankov B, Bulsara MK (2002) Patellar resurfacing in total knee arthroplasty: a prospective, randomized trial. *J Bone Joint Surg Am* 84-A:187–193
19. Badhe N, Dewnany G, Livesley PJ (2001) Should the patella be replaced in total knee replacement? *IntOrthop* 25(2):97–99
20. Kuntal Patel & Videsh Raut International Orthopaedics (SICOT) (2011) 35:349–353 DOI 10.1007/s00264-010-1063-z Patella in total knee arthroplasty: to resurface or not to—a cohort study of staged bilateral total knee arthroplasty