

## Short Term Outcomes of Non-Surfacing Patelloplasty in Primary Total Knee Arthroplasty

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### ABSTRACT

**Background:** The management of the patella during primary total knee arthroplasty (TKA) is controversial. The most common methods of treating the patella in TKA are patellar resurfacing and non-surfacing patelloplasty.

**Objectives:** The aim of this study was to assess short term outcomes of non-surfacing patelloplasty in primary total knee arthroplasty.

**Patient and methods:** This study included a total of twenty patients who had primary total knee arthroplasty for degenerative or inflammatory arthritis accompanied with moderate to severe patellofemoral arthritis attending at Al-Azhar University Hospitals. Patelloplasty was done in the form of excision of peripatellar synovial tissues, osteophyctomy and denervation of patellar rim using electro-cautery and smoothing of the articular surface by oscillating saw. **Results:** All patients were examined using a new patellofemoral scoring system, after one year follow up after total knee arthroplasty (TKA) the end result was: 14 patients were very satisfied, while 5 patients had mild to moderate anterior knee pain, tolerated by analgesics on demand and physiotherapy. Only one case had severe pain and secondary resurfacing was done about 6 months postoperatively, the patient was satisfied, and the pain became mild.

**Discussion:** Total knee arthroplasty (TKA) is one of the most commonly performed operations in adult reconstructive surgery. The management of the patella in primary TKA remains controversial. The approaches available for patellar management in TKA are non-resurfacing patelloplasty, and selective resurfacing.

**Conclusion:** It is recommended to do patelloplasty without resurfacing of the patella as this technique has fewer hazards and complications.

**Keywords:** anterior knee pain, patellar denervation, patelloplasty, total knee arthroplasty.

### INTRODUCTION

Total knee arthroplasty (TKA) is the efficient surgical way for functional betterment and pain comfort in osteoarthritis (OA) and rheumatoid arthritis (RA) patients. It is a very common surgical operation for relieving pain and improving function, with a very high patient satisfaction rating<sup>(1)</sup>.

The management of the patella during primary total knee arthroplasty (TKA) is controversial<sup>(2)</sup>.

When a decision is made not to resurface the patella, the patella may be left alone or undergo a "tidy up" procedure (patelloplasty). Numerous different combinations of surgical steps include a patelloplasty<sup>(3)</sup>. Proponents of patellar non-resurfacing suggest that to the post-resurfacing complications such as patellar fracture, avascular necrosis (AVN), patellar tendon injury, extensor mechanism rupture, patellar clunk syndrome and instability requiring reoperation after resurfacing<sup>(4)</sup>. The aim of this clinical study was to evaluate the effects of patelloplasty in total knee arthroplasty as regards new patellofemoral scoring system (clinical and radiological) and possible complications.

### PATIENT AND METHODS

This study included a total of twenty patients who had primary total knee arthroplasty for degenerative or inflammatory arthritis accompanied with moderate to severe patellofemoral arthritis

attending at Al-Azhar University Hospitals. **Approval of the ethical committee of Al-Azhar University and a written informed consent from all the subjects were obtained.** This study was conducted between 2016-2018.

There were 8 men and 12 women with a mean age at the time of the operation was about 62 years. Pre-operatively and according to sex type, the included subjects were divided into two groups; I and II. The two groups had the same indications for surgery. All the operations of enrolled cases were performed by same team of surgeons. Patelloplasty was done in the form of excision of peripatellar synovial tissues, osteophyctomy and denervation of patellar rim using electro-cautery and smoothing of the articular surface by oscillating saw.

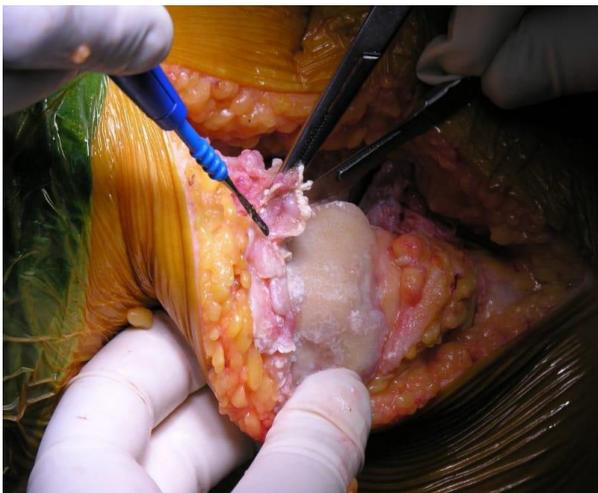
**The inclusion criteria** were patients with tibiofemoral osteoarthritis (OA) or rheumatoid arthritis (RA) who have symptoms consistent with patellofemoral arthritis such as anterior knee pain, or who have moderate to severe patellofemoral arthritis exhibiting radiographic changes consistent with patellofemoral arthrosis, such as loss of joint interval. **Exclusion criteria** were patients who previously had a patellar operation such as patellectomy, patellar realignment operation or a high tibial osteotomy, patients who previously had a patellar dislocation and revision knee arthroplasty.

Of the 20 patients there were 18 (90%) patients with osteoarthritis knee and 2 (10%) patients with rheumatoid arthritis. All patients had unilateral TKA and had a follow up duration with a mean of 16.9 months for group (I) and 18.3 months for group (II) but the end point was one year to standardize the results. Preoperative anteroposterior, lateral and skyline knee radiographs were made for all cases. Pre and postoperative Plain X ray (AP weight-bearing, Lateral and Patellar views) were done for all cases.

**Operative Technique:**

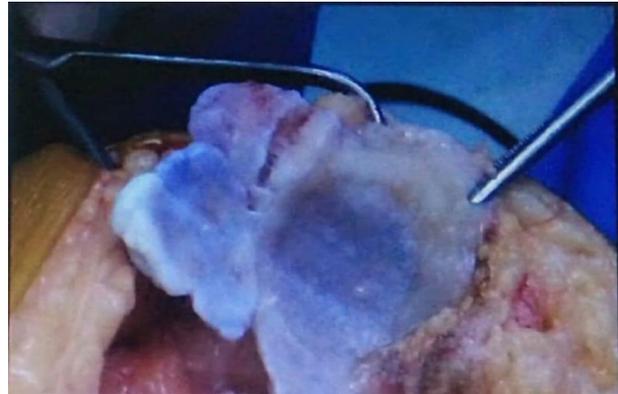
For all patients, Epidural anesthesia was used, and urinary catheterization was applied due to the effect of epidural anesthesia on control of urinary system and due to difficult patient movement in the first few days postoperatively. A pneumatic tourniquet was applied with softban liner as high as possible over the thigh in all cases of this study. The inflation pressure was around (400 mmHg). Medial para-patellar approach was used in all cases.

After finishing Tibial and femoral cuts and its preparations, the knee is placed in extension. To ensure adequate exposure of the patella, the synovial tissue is excised to the level of insertion of the quadriceps and patellar tendons but with precaution not to destroy tendon insertions into the bone (Fig. 1).



**Figure (1):** the synovial tissue is excised to the level of insertion of the quadriceps and patellar tendons.

The patellofemoral ligament was released. Then above holding forceps with pointed tip was used to firmly hold the patella and all peripheral osteophytes were taken off using Rongeur bone nibbler and smoothing of the articular surface by oscillating saw to regain more or less the normal patellar shape (Fig.2, 3).

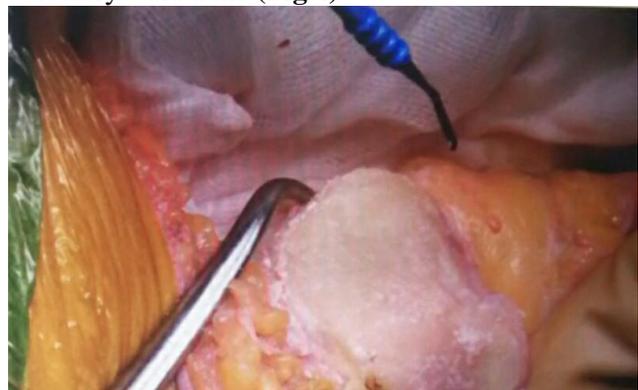


**Figure (2):** The patella is firmly held by pointed bone holding forceps and osteophyctectomy is done.



**Figure (3):** smoothing of the articular surface by oscillating saw.

Denervation of the patellar edges using electrocautery were done (Fig.4).



**Figure (4):** Denervation of the periphery of the patella.

**RESULT**

Twenty patients with tibiofemoral and patellofemoral osteoarthritis (18 Patients) or rheumatoid arthritis (2 patients) underwent primary TKA without resurfacing. 14 patients (70%) were very satisfied after operation, only there were 6 patients (30%) that had anterior knee pain started about 2-4 months after the operation. The pain was mild to moderate and tolerated by analgesics on demand and physiotherapy in 5 cases, (3 of them became very satisfied while the 2 others were

moderately satisfied). Only one case had severe pain and secondary resurfacing was done about 6 months postoperatively, at the one year follow up the patient was satisfied and the pain became mild. The 20 patients included in this study had a follow up duration with a mean of 16.9 months for group (I) and 18.3 months for group (II) but the end point in this study was one year to standardize the results.

## DISCUSSION

The aim of this clinical study is to evaluate the effects of patelloplasty in total knee arthroplasty as regards new patellofemoral scoring system (clinical and radiological) and possible complications.

TKA is one of the most generally performed operations in adult reconstructive surgery. The management of the patella in primary TKA remains controversial. The approaches available for patellar management in TKA are non-resurfacing patelloplasty, and selective resurfacing<sup>(5)</sup>. Proponents of routine patellar resurfacing propose that this procedure can decrease the incidence of anterior knee pain and potentials of secondary resurfacing after TKA<sup>(2, 6, 7)</sup>.

Proponents of patellar non-resurfacing because this approach has less complications especially that occurs in higher rate post-resurfacing such as patellar fracture, extensor mechanism disruption, patellar clunk syndrome and instability requiring reoperation after resurfacing. Also some literatures failed to show clear superiority of patellar resurfacing over non-resurfacing<sup>(5,8,9)</sup>.

In our study, 20 patients with tibiofemoral and patellofemoral osteoarthritis (18 Patients) or rheumatoid arthritis (2 patients) underwent primary TKA without resurfacing. All patients were examined postoperatively using a new scoring system which includes questions and tests specific to the anterior compartment of the knee and the final total score is from 100 degree, after one year follow up after TKA the end result was: 11 patients had full mark (100%), 2 patients had (95%), 2 patients had (90%),

One patient had (85%), 2 patients have (75%), One patient had (70%) and only one patient had (50%) from 100 degrees.

*Campbell et al.*<sup>(5)</sup> reported in their series that the mean clinical knee society score improved from 36.0 points preoperatively to 71.8 at four years follow up for the resurfaced patients. While in the non-resurfaced group from 39.9 points to 74.9. The 50 points allotted to the pain component of the Knee Society score were analyzed as an independent variable and no variation between treatment groups was detected.

The mean functional knee score improved from 42.7 preoperatively to 65.8 at 4 years follow up for the resurfaced group, and in the non-resurfaced group (from 47.5 to 60.5).

There was no statistically important variation between the treatment groups as regards clinical and functional knee society score<sup>(5)</sup>.

## CONCLUSION

Our data couldn't be generalized on all primary TKA due to limitation of this study as we depend on small numbers of cases (20 patients) with short period of follow up not exceed one year and lack of comparative study groups. Analysis of our results revealed similar results between osteoarthritic and rheumatoid patients, also between patients with varus versus valgus deformity.

In conclusion, we could recommend the technique of non surfacing patelloplasty used in our study.

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