

## The Effect of Lateral Patellar Facetectomy on Clinical Results in Patellar Resurfacing Total Knee Arthroplasty

Gokhan Bulent Sever<sup>1</sup>

<sup>1</sup> Sanko University Hospital, Department of Orthopaedic Surgery, Gaziantep, Turkey

ORCID; 0000-0002-3096-5968

**Abstract;** The purpose of this study is to research the effect of lateral patellar facetectomy to clinical results on patients who have undergone patellar resurfacing total knee arthroplasty operations. Between June 2018 and May 2020, 59 patients with a diagnosis of advanced gonarthrosis who underwent total knee replacement and patella resurfacing were included in the study. Patients were divided into 2 groups according to lateral patellar facetectomy. Clinical assessments of the patients were made pre-surgical and post-surgical (6th and 12th months) with WOMAC (Western Ontario and McMaster Universities Osteoarthritis Index) and Kujala scores. VAS was used for pain assessment. Although there was no statistical difference between the two groups in terms of preoperative Kujala test, a statistically significant difference was found in favor of the facetectomy group in the comparison of both groups at the 6th and 12th months after surgery. The preoperative Womac test score was statistically significantly lower in the group scheduled for facetectomy. In the comparison at the 6th and 12th months after surgery, it was observed that the womac score improved significantly in the facetectomy group and there was a statistically significant difference between the two groups in favor of the facetectomy group. The excision of lateral patellar facet during patellar resurfacing total knee prosthesis surgery affects the clinical results positively.

### INTRODUCTION

Anterior knee pain is one of the main reasons for failure in a total knee prosthesis <sup>1,2</sup>. Most important causes of anterior knee pain are patellofemoral osteoarthritis, patellar maltracking and lateral patellar facet impingement <sup>3</sup>. The risk of anterior knee pain complications can be reduced through patellar resurfacing, yet the sole use of patellar resurfacing might not be able to prevent anterior knee pain in all cases <sup>4,5</sup>.

Facetectomy was first defined in 1972 <sup>6</sup>. After that, studies that suggest lateral patellar facetectomy to be a simple and efficient treatment in cases of anterior knee pain related to patellofemoral osteoarthritis and lateral patellar compression syndrome have been written on the subject <sup>7,8</sup>. Some researchers report successful results of partial lateral patellar facetectomy after total knee arthroplasty surgery (TKA) <sup>8,9</sup>. It can be seen that these studies have been done on patella retaining TKA surgery. Studies researching the effect of lateral patellar facetectomy on patellar resurfacing TKA surgery are limited <sup>5</sup>.

The purpose of this study is to research the effect of lateral patellar facetectomy to clinical results on patients who have undergone patellar resurfacing TKA surgery.

### PATIENTS and METHODS

This study has been ratified by the SANKO University Clinical Research ethics board. 59 patients who were applied total knee prosthesis at SANKO University Research Hospital by a specific surgeon during June 2019- May 2021 were included in the study. Patients who underwent TKA because of posttraumatic arthritis and inflammatory arthritis, who got infected post-surgical, who developed periprosthetic fractures, who were applied lateral retinacular release due to patellar maltracking and who weren't applied patellar resurfacing were excluded from the study.

Patellar resurfacing was applied to patients who had anterior knee pain and moderate to severe patellofemoral osteoarthritis. Patellar resurfacing was applied to all patients included in the study. Patients were divided into 2 groups regarding if they were applied lateral facetectomy in addition to resurfacing. Those who underwent facetectomy were named "Study Group" (group 1) and those who didn't were named "Control Group" (group 2). Patients of the study were chosen randomly. Facetectomy was applied in a way where after the biggest possible patellar component was placed, the

Received : 07/18/2021  
Received in revised form : 09/22/2021  
Accepted : 11/10/2021  
Available online : 01/15/2022

Keywords:

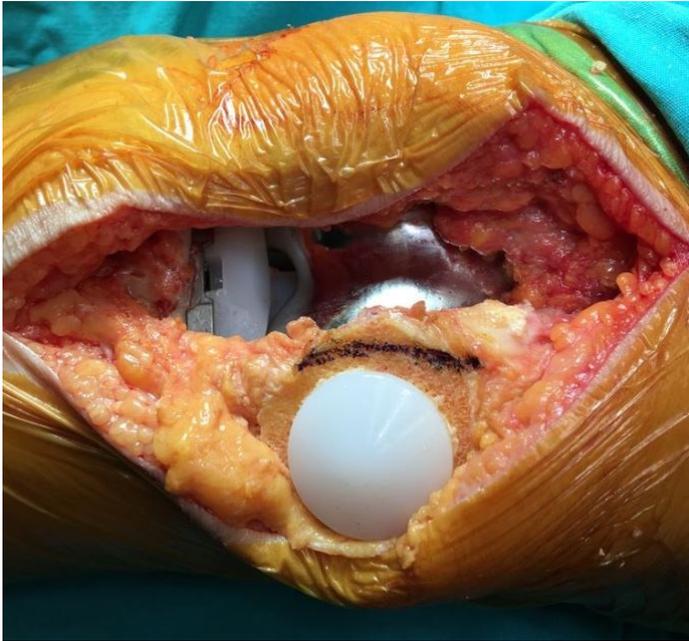
Facetectomy  
Patellar resurfacing  
Total knee arthroplasty  
Clinical results

Corresponding Author:  
Gokhan Bulent Sever  
E-mail: gokhanbsever@yahoo.com  
http://dx.doi.org/10.29228/jamp.52864

Int J Acad Med Pharm,  
2022; 4 (1); 77-79



lateral facet length would be 5 mm (Figure 1,2). Meanwhile in the control group, no processes were applied to the lateral facet, non-regarding the lateral facet length. A patient who had anterior knee pain when our clinic didn't perform facetectomies and didn't undergo patellar resurfacing was noticed to have an unnaturally wide lateral facet during a secondary resurfacing surgery. The patient had a facetectomy. Afterwards, when the patient's complaints ended, this research was made on the idea that applying a facetectomy in addition to resurfacing would ease anterior knee pain.



**Figure 1.** View of the planned facetectomy area during surgery.



**Figure 2.** View of the resurfaced patella after lateral patellar facetectomy

All patients were subject to posterior substituting Stryker TKA. Longitudinal skin incision was used with all patients, and the capsule medial parapatellar was opened. Bone incisions were made according to the producer firm's guides. Extramedullary incision guide was used in tibial incisions. Patella were everted before patellar incision while the knee was fully extended. Denervation with cotery and soft tissue debridement were performed around the patella. After the osteophytes were cleaned, patella was clamped both from the superior and inferior.

Patellar thickness was measured using flat-tipped calipers. Using the guide, patellar incisions with an average deepness of 10 mm, parallel to the coronal plane. After the incision, patellar size measurements were done with the installation of medial component guides. 3 pag holes were drilled for the components' placement. Trial patellar components were placed and the width of the facet was measured with a sterile disposable ruler. Facets that were wider than 5 mm were cut to 5mm lateral patellar bone width with the help of a fine-tipped saw and a rasp. The facetectomy was practiced in concordance to the patella contour. The patellar component was placed with the help of cement, along with other components. Clinical assessments of the patients were made pre-surgical and post-surgical (6th and 12th months) with WOMAC and Kujala scores <sup>10</sup>. VAS was used for pain assessment.

## RESULTS

In total, 59 patients were included in the study. 11 (18.6%) out of the patients were male while 48 (81.4%) were female. Patients' ages were averaging at  $67 \pm 7.5$  (Range 49-86). 30 (50.8%) of the 59 cases were on the left side, while 29 (49.2%) were on the right. 36 (61%) of the patients underwent facetectomy. No differences in terms of sex was spotted between the groups which underwent facetectomy (group 1) and didn't (group 2) ( $P=0,379$ )

When the patients were assessed in these two groups, no significant preoperative differences were noticed in VAS scores on the 6th and 12th months. ( $P=0,379-0,957$ )

There were however significant differences between the two groups in terms of age ( $P=0,021$ ). Patients who underwent facetectomy had an average age of  $67.7 \pm 7.9$  (range 49-86) while those who didn't had an average age of  $65.9 \pm 6.9$  (range 54-82). BMI didn't show equal distribution, therefore the differences in BMI between the two groups were assessed through Mann-Whitney U test. No significant difference was spotted ( $P=0,215$ ).

Since pre op womac distributed equally, the differences in preop womac between the two groups were assessed through Student t test. There was a significant difference between the groups ( $P=0,014$ ). The results were  $33.3 \pm 9.4$  for group 1 and  $39.6 \pm 8.8$  for group 2.

Since 6th month womac values showed homogenous distribution, the differences in 6th month womac values between the two groups were assessed through Student t test. There was a significant difference between the groups ( $P<0,001$ ). The results were  $82.4 \pm 9.2$  for group 1 and  $72.4 \pm 10.9$  for group 2.

12th month womac values didn't show equal distribution, therefore the difference between the two groups was assessed through Mann-Whitney U test. There was a significant difference between the groups ( $P<0,001$ ). The results were  $92.8 \pm 9.1$  for group 1 and  $86.4 \pm 10.7$  for group 2.

Since preop kujala distributed equally, the differences in preop kujala between the two groups were assessed through Student t test. There was no significant difference between the groups ( $P=0,175$ ). The results were  $35.1 \pm 8.3$  for group 1 and  $32.3 \pm 6.6$  for group 2.

6th month kujala values showed homogenous distribution, therefore the differences in 6th month kujala values between the two groups were assessed through Student t test. There was significant difference between the groups ( $P=0,009$ ). The results were  $76.4$  for group 1 and  $66.9$  for group 2.

12th month kujala values didn't show equal distribution, therefore the difference between the two groups was assessed through Mann-Whitney U test. There was significant difference between the groups ( $P=0,009$ ). The results were  $89.5$  for group 1 and  $84.6$  for group 2.

Preop, 6th month and 12th month Womac values of the groups

were compared through variance analysis. While there was no difference in pre op values ( $P=0.175$ ), significant differences were spotted in 6th and 12th month values ( $P<0.001$ ).

## DISCUSSION

The findings of this study has shown us that in patients with total knee prosthesis who underwent patellar resurfacing, applying patellar facetectomy affects the clinical results positively.

It was stated before that partial lateral facetectomy results in better clinical outcomes in patients with isolated patellofemoral osteoarthritis<sup>7,8</sup>. There have also been studies on results of partial lateral facetectomy on patients who underwent TKA<sup>9,11,12</sup>. It is observed that these studies were made on patients with patellar retaining TKA. Lakstein operated lateral facetectomy on 23 with abnormal patellar tracking of 191 patients, and when comparing with the control group consisting of 46 patients, found the results of functional and radiologic results to be "alike"<sup>9</sup>. In the Zhang study, patients who underwent patellar retaining knee prosthesis were studied and compared on if they underwent lateral facetectomy. This study reported that better clinical results were obtained for those with facetectomy<sup>11</sup>. In another study, Pagenstert examined the results of facetectomy on patients with lateral patellar facet syndrome who underwent non resurfacing TKA, and after 3-4 years of observation, pain levels and ranges of motion were better in patients who underwent facetectomy<sup>12</sup>. These studies were carried out with patients with patellar retaining knee prosthesis.

When we searched the literature, only one study was found in which patients who underwent lateral patellar facetectomy in addition to patellar resurfacing total knee replacement were followed. In this study, Chang compared patients with patellar retaining+ facetectomy who underwent resurfacing TKA+ facetectomy to those who didn't. When they compared the 53 patients who underwent facetectomy to the 67 others in the patient group (n=120), they specified that facetectomy had no positive effect on clinical results. They have stated however that in radiological comparisons, facetectomy helped the tilt angle get better<sup>5</sup>.

Our study is one that researches the effects of facetectomy on clinical results in patients who underwent patellar resurfacing TKA. The size of the facetectomy was also tried to be pointed out during surgery. When the results were examined, it was observed that even though there is no difference between the two groups in terms of VAS pain score, there are significant differences in terms of Womac and Kujala clinical scores. While preop Womac scores were higher on patients without facetectomies, it was observed that significant improvements took place in favor of patients with facetectomy in 6th and 12th month comparisons. The other test that was run, Kujala, is even more important because of its patellofemoral scores. While there wasn't significant difference between the two groups in preop Kujala results, later evaluations showed that there were significant improvements that favored patients who underwent facetectomy.

The reason why post-TKA patellar facetectomy has positive effects on clinical results is still unknown. Kim suggested that this effect might be caused by loosening of the lateral retinaculum with lateral facetectomy<sup>5</sup>. The studies made on cadavres by Yuenyongviwatve also support this theory. Yuenyongviwatve proved that lateral facetectomy decreases peak patellofemoral contact pressure on patients with patellar retaining total knee prosthesis<sup>13</sup>. Even though the reason isn't clearly stated before, our study has proved that facetectomy has improved clinical results significantly.

The present study has some limitations. First, a small number of patients were included in the study. In addition, isolated lateral patellar facet syndrome is a diagnosis that can be made after all other possible causes of painful TKA have been excluded, and therefore the accuracy of this diagnosis is debatable. Second, the single implant design in

surgery was applied in a clinic by the same surgeon. Finally, the evaluation period of the study is short. The current study should be supported by studies reporting longer clinical follow-up.

## Conclusion

The excision of lateral patellar facet during patellar resurfacing total knee prosthesis surgery affects the clinical results positively. Surgeons performing patellar resurfacing TKA should take lateral patellar facet into consideration during surgery and take into account that lateral facetectomy might contribute well to clinical results.

## Conflicts of interest statement

The authors declare no conflicts of interest.

## REFERENCES

1. Atik O.S, Sever G.B. The survivorship of unicompartmental knee arthroplasty is poorer compared with total knee arthroplasty. *Joint Diseases and Related Surgery*. 2021;32(1):274,75.
2. Parvizi J, Mortazavi SM, Devulapalli C, Hozack WJ, Sharkey PF, Rothman RH. et al. Secondary resurfacing of the patella after primary total knee arthroplasty does the anterior knee pain resolve? *J Arthroplasty*. 2012;27(1):21-6.
3. Burnett RS, Bourne RB. Indications for patellar resurfacing in total knee arthroplasty *Instr Course Lect*. 2004;53:167-86.
4. Migliorini F, Eschweiler J, Niewiera M, El Mansy Y, Tingart M, Rath B. et al. Better outcomes with patellar resurfacing during primary total knee arthroplasty: a meta-analysis study. *Arch Orthop Trauma Surg*. 2019 ;139(10):1445-1454.
5. Kim CW, Lee CR, Seo SS, Gwak HC, Kim JH, Park JH. et al. Clinical and radiologic outcomes of partial lateral patellar facetectomy in total knee arthroplasty *J Knee Surg*. 2017;30(2):185-192.
6. O'Donoghue DH. Facetectomy. *Soth Med J* 1972;65(6):645-654
7. Wetzels T, Bellemans J. Patellofemoral osteoarthritis treated by partial lateral facetectomy: results at long-term follow up. *Knee*. 2012;19(4):411-5.
8. Paulos LE, O'Connor DL, Karistinos A. Partial lateral patellar facetectomy for treatment of arthritis due to lateral patellar compression syndrome. *Arthroscopy*. 2008;24(5):547-53.
9. Lakstein D, Naser M, Adar E, Atoun E, Edelman A, Hendel D. et al. Partial lateral patellar facetectomy as an alternative to lateral release in Total Knee Arthroplasty (TKA) *J Arthroplasty*. 2014;29(11):2146-9.
10. Kujala UM, Jaakkola LH, Koskinen SK, Taimela S, Hurme M, Nejmarmka O. Scoring of patellofemoral disorders. *Arthroscopy* 1993;9(2):159-163.
11. Zhang LZ, Zhang XL, Jiang Y, Wang Q, Chen YS, Shen H. et al. Lateral patellar facetectomy had improved clinical results in patients with patellar-retaining total knee arthroplasty *J Arthroplasty*. 2012;27(8):1442-7.
12. Pagenstert G, Seelhoff J, Henninger HB, Wirtz DC, Valderrabano V, Barg A. et al. Lateral patellar facetectomy and medial reefing in patients with lateral facet syndrome after patellar retaining total knee arthroplasty. *J Arthroplasty* 2014;29(11):2156-2162.
13. Yuenyongviwat V, Iamthanaporn K, Hongnaparak T. Lateral facetectomy decreased patellofemoral contact pressure in total knee replacement: A cadaveric study. *Journal of Clinical Orthopaedics and Trauma* 2017;8:82-84.