

Management of the Patella on Total Knee Arthroplasty

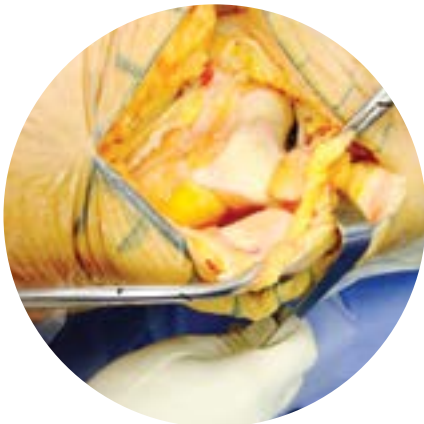


David Sadigursky, MD
Salvador, Bahia, BRAZIL

One of the subjects of greatest controversy in total knee arthroplasty (TKA), refers to resurfacing (RS) or not the patella (NRS). Arguments both for and against the procedure have been individually justified and reported in the literature.

The resurfacing technique began to be performed due to a greater incidence of anterior knee pain, with non-resurfacing, undergoing modifications in the components used over the years, increasing from 30% to 68% between 1970 and 1985 (Ranawat 2002). More recently, this popularity started to decline, and patellar non-resurfacing started to gain popularity among surgeons around the world. Some authors recommend not resurfacing the patella (NRS), some recommend selectively resurfacing the patella and others recommend always resurfacing the patella (RS). Data published in the literature show that, in the short term, the outcome scores are similar when it comes to pain and function, in addition to the fact that the two groups of patients present postoperative complications, adding further debate on the subject.

Historical studies between 1986 and 2003 about non-resurfacing showed a higher incidence of anterior knee pain, between 10% and 29%, in comparison to those who did the patellar component (Soudry & Insall 1986; Picetti 1990; Levitzky & Scott 1993; Boyd 1993; Water & Bentley 2003). In meta-analysis studies between 2005 and 2009, results with greater anterior knee pain and higher re-operation rates are demonstrated. Rheumatoid arthritis patients, however, present the best results, with resurfacing featuring as a consensus in these studies.



Resurfacing has been questioned due to frequent complication rates, between 4% and 50%. The most common reasons for patellar complications are patellar fracture, instability, loosening, tendon breakage and soft tissue impingement. These complications have led surgeons to prefer non-resurfacing in order to avoid such disastrous complications. However, these complications could be attributed to implant types used with lower designs and the surgical technique employed (Boyd 1993). Consequently, new implants were developed with more anatomic formats to support the patella during the range of motion, known as “patella-friendly” TKA (Matsuda 2000). However, the studies were unable to demonstrate differences in results when compared with the rest of these implants not deemed “patella-friendly”.

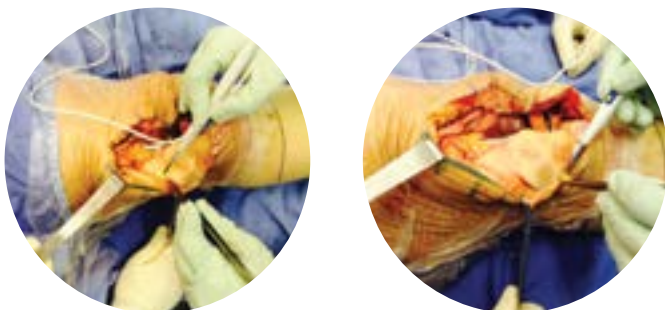


Over 25 years, the proportion of reviews attributed to patella resurfacing have been dropping from almost 50% in 1980 to about 12% presently. The prevalence of patellofemoral complications have also declined significantly, rating around 4%–5% currently (Schindler 2011).

Pavlou et al., in a meta-analysis performed with 18 randomized controlled trials compared resurfacing during TKA (n = 3463) with NRS patients (n = 3612), finding no significant difference between the groups regarding the prevalence of anterior knee pain and functional outcome. The authors demonstrated the weaknesses of the study, which depended on the quality of the randomized trials included, with different follow-ups and different implant designs that were analysed together. Even if non-resurfacing patients have the option of a new resurfacing procedure in second time, the literature has been demonstrating lower results in anterior knee pain relief in these reoperation cases. Muoneke et al. in 2003, in a study with 20 patients who underwent a resurfacing procedure in second time, with a follow-up of 6 months, demonstrated that only 44% of the patients improved, while 30% had complications such as fracture, instability and decreased range of motion, which denote a procedure with inferior results when performed in second time.

In 2012, Pilling et al. in a meta-analysis published in *JBJS Am*, while analyzing randomized and controlled trials, found similar results in anterior knee pain and satisfaction, however, resurfacing patients underwent fewer additional procedures. The possibility of being subjected to new surgical procedure due to previous knee pain was 1% if the patella was resurfaced compared with 6% if it had not been subjected to the procedure. This difference probably occurred due to the likely temptation to attribute anterior knee pain to not resurfacing the patella.

In general, Total Knee Arthropathy, when it comes to function and longevity, has been investigated for years, demonstrating a rate of 15-20% of dissatisfaction with the function and relief of pain. This unsatisfactory outcome for a group of patients may not be related to known complications such as infection, instability, loosening, misalignment and implant failure. Therefore, the function and the preoperative pain must be defined, along with psychological and emotional factors that can consistently interfere with long-term results (Noiseux et al. 2014). Other etiological factors might be related to anterior knee pain and decrease of outcome scores, such as discomfort on incision, decreased sensitivity, neuromas, bursitis, tendonitis, patellar instability and fractures (Burnett & Bourne Inst Course Lect 2004). Dennis et al. (2010), showed the incidence of painful patellar creptos after TKA, with implants that replace the posterior cruciate ligament, in the range of 0% to 14%. The causes found are related to several factors including the decrease of patellar tendon length, the use of a smaller patellar component, the increase of anterior femoral condyle offset, which can increase the intensity of quadriceps tendon contact against the superior aspect of the inter-condylar box, hence increasing the risk of fibro-synovial proliferation with the entrapment in the inter-condylar region of the femoral component. It is recommended to pay attention to these factors in order to avoid the increase in prior post-Arthroplasty incidence. These can be added to the set of factors that can contribute to the decision between the patellar resurfacing or not.



The most recently developed implant types and the assessment tools specifically validated to assess post-TKA patellofemoral pain and function must be included in future studies to reach a consensus regarding this subject, including regarding a group of selective patellar resurfacing patients. More precise assessment criteria must be developed in order to define this procedure. Therefore, we remain uncertain concerning which procedure would be the most appropriate one between performing patellar resurfacing or not (Bourne 2011).

For surgeons who do not perform patellar resurfacing, some authors present the possibility of decreasing the incidence of anterior knee pain with the patellar denervation procedure, which has been performed by many surgeons all over the world, including surgeons in Brazil. The thermo-coagulation around the patella margin with electro-cautery was first written by Keblish in 1991. In the Netherlands, 56% of the surgeons defend the procedure (Van Jorbergen et al. 2010). The term used is itself considered controversial, due to the anatomy of the innervation of the patella. It is innervated by multiple superficial sensory nerves, and the presence of Substance-P fibers, Ruffini and Pacini Corpuscles were documented. However, there is no evidence of their exact role in the patella (Maralcan et al. 2005).

We usually perform circumferential thermocoagulation of the patella rim with electrocautery (ECP) for patellar non-resurfacing. Pulavarti et al (2013), in a randomized controlled trial with 126 patients separated in two groups (63=EPC and 58 = no EPC) with a 2-year follow-up, demonstrated that the circumpatellar electrocautery seems to be a safe procedure that produces an increase in the satisfaction rate and flexion gain in patients after 2 years from the surgery. On the other hand, no clinical or statistical differences were found in the validated standardized assessment rating scores. This outcome contrasts with the one reached by Yim et al (2012), who evaluated the clinical effects in reducing anterior knee pain performing ECP in bilateral Arthroplasty with patellar non-resurfacing during TKA, not finding any statistical differences in the improvement of function, range of motion and assessment clinical scores.

However, it is not surprising that Arthroplasty national records data show a very wide gap in the proportion of patellar resurfacing in different countries. This is a fact that cannot be attributed simply to cultural differences, making it necessary to analyse the multifactorial aspect.

Many studies are yet to be carried out so that we can define the best procedure to be performed, with the development of appropriate tools aim to assess the outcome more precisely, as well as the development of more specific implants. Taking the evidence found in the present literature into consideration, the performance of patellar resurfacing should still be considered as a choice of the surgeon and it should be reached in agreement with the patient, who must be aware of the possible complications associated with each person's individual factors.

The appropriate surgical technique with the correction of alignment and positioning of the implant remains the best method in order to avoid anterior knee pain and its associated complications, achieving more satisfactory results in the long term. As pointed out by Schindler in his review, with the phrase of the Roman poet Ovid (43BC-18AD) "in medio tutissimus ibis", considering the compromise of the selective resurfacing, that is, the decision between the extremes should be defined by more precise criteria.