

Patellar resurfacing after endoprosthetic replacement for primary or secondary bone tumors

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The question of whether or not to resurface the patella during primary total knee replacement (TKR) is an enduring controversy in orthopaedic surgery (1-4). Opinion is divided—some surgeons will routinely resurface the patella, some will never resurface and the remainder will resurface or not on the basis of the appearance of the patella at operation or the location of the patient's pain. Osteoarthritis (OA), the most common indication for TKR, is considered to be a disease of the whole joint and proponents of resurfacing suggest that the whole joint should be treated; indeed, a proportion of cases in whom patellar resurfacing is not performed will later go on to undergo secondary resurfacing. Those who do not tend to resurface the patella point to the morbidity associated with patellar resurfacing, which may predispose to patellar fracture and extensor mechanism rupture (5). On the basis of the current evidence, patellar resurfacing appears to have a small effect the overall rate of revision following surgery (probably as a result of eliminating secondary resurfacing), but has little or no effect on patient-reported outcome measures (PROMs) after TKR (2).

Patients undergoing endoprosthetic replacement (EPR) for primary or secondary bone tumors differ from those undergoing TKR for OA in a number of features; they are generally younger, have higher levels of pre-operative function and importantly, have no ongoing disease process within the knee joint. They also have a high rate of extensor mechanism—related complications as EPRs require extensive soft tissue and bony resections, and patella alta or baja can result from inadequate restoration of the native joint line. In this context, it would appear to make intuitive

sense to leave the patella unresurfaced. However, even in an essentially normal patella, articulation of cartilage against the metal of the implant can lead to symptomatic degenerative change in the patellar cartilage, exposing the patient to the need for further surgery with its attendant risks.

The study of Etchebehere *et al.* published in the Journal of Bone and Joint Surgery in April of this year attempts to bring some clarity to the issue (6). They present the results of a retrospective series of 108 patients who had undergone distal femoral EPR for neoplastic disease (in most cases, a primary malignancy of bone, most commonly osteosarcoma), with a mean follow-up of 4.5 years. Of the 108 patients, 48 (44%) had undergone patellar resurfacing. The patients in the two groups were broadly comparable aside from a large difference in age (with the non-resurfaced group being significantly younger, with a mean age of 28 years, compared to 41 years in the resurfaced group), and surgical approach (with 65% of patients in the non-resurfaced group having undergone their surgery through a medial approach and 83% in the resurfaced group undergoing their surgery through a lateral approach). The primary outcome was patella-related knee function, with three measures (the presence of documented anterior knee pain or extensor lag, and the range of movement) reported at 1 year. Secondary outcomes included patella-related complications (symptomatic instability or clunking, radiographic evidence of subluxation, dislocation, degeneration or impingement), patella-related reoperations and general functional outcome measured using the Musculoskeletal Tumor Society scale (7). Baseline

differences between the groups were addressed using a linear regression model.

The authors report no significant differences between the groups in the incidence of anterior knee pain, range of movement or extensor lag. Around half (48%) of patients in the non-resurfaced group had radiographic evidence of patellar OA but this was not associated with symptoms (although future problems cannot be discounted as follow-up was only short-term). Complications, patellar height, need for patella-related reoperation and final functional outcome were similar in the two groups. The only other significant difference between the two groups was a higher incidence of peripatellar calcifications in the resurfacing group—this was not associated with pain and the clinical significance of this radiographic finding is unclear.

Clearly, the study design is not without its limitations—this was a retrospective study with significant imbalance in covariates between groups, the follow-up was short, functional scores were only available in around half of the patients, we do not know why surgeons elected to resurface some patellae and not others, and patients were not directly asked about patellofemoral symptoms, which may explain the lower overall rate of such symptoms when compared to previous series (8). A prospective, and ideally, randomized trial would be the optimal design to answer this question—however, the rarity of the condition and the low overall rate of patella-related complications would render this extremely challenging.

Within these constraints, the authors have produced an important study. It is the largest series examining this question to date and is the first to examine the relationship between function and patellar resurfacing whilst adjusting for baseline differences between the two groups. It is unlikely to change practice amongst oncologic knee surgeons—the authors conclude that, in the absence of a clear advantage to either strategy, surgeons should continue to exercise their clinical judgement as to whether to resurface the patella—but it gives us the best evidence yet to support current practice. One additional and striking finding evident from this study and from the existing literature is that the rate of patellar complications is high in this cohort with 16% having subluxation or dislocation of the patella, 23% having patellar impingement and 22% having other patellar complications such as fracture and arthrofibrosis in this study alone. It seems clear that surgical technique, particularly in terms of achieving optimal rotation of the femoral component and restoration of the joint line, is substantially more important than the choice

of whether or not to resurface the patella in this group of patients.

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Footnote

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