

Patellar resurfacing as a second stage procedure for persistent anterior knee pain after primary total knee arthroplasty

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Abstract

Purpose Knee pain after total knee arthroplasty may be caused by an unresurfaced patella. Secondary isolated resurfacing of the previously unresurfaced patella in total knee arthroplasty remains controversial. The aim of this retrospective study was to evaluate the outcome after patellar resurfacing as a second stage procedure.

Methods The study included 22 patients (13 female/nine male) who underwent resurfacing of the patella with a mean follow-up of 61.8 ± 39.2 months. The mean age of the patients was 60 ± 9.7 years at the time of operation. The average period between total knee arthroplasty and patellar resurfacing was 26.3 ± 15.2 months. The patient's subjective satisfaction was assessed by a custom-made questionnaire.

Results The mean Knee Society Score improved significantly from 60.1 ± 8.3 to 77.0 ± 6.3 ($p=0.0063$). The mean functional score also improved significantly from 42.7 ± 2.3 to 60.2 ± 3.9 ($p=0.001$). Three patients (13.6%) needed further operative revision.

Conclusions Although clinical scores showed significant improvement some patients continued to have pain and remained dissatisfied without detecting a specific reason. Further studies are needed to better elucidate the benefit of patellar resurfacing as second stage procedure.

Introduction

Total knee arthroplasty (TKA) has become an effective and successful procedure in the treatment of primary osteoarthritis of the knee, with an increasing number of arthroplasties performed yearly [15]. Several reports have been published with similar clinical and functional outcomes, with or without patellar resurfacing [1, 5, 20, 21]. In addition, several complications after resurfacing such as patella fracture, dislocation or avascular necrosis have been reported [3].

The management of persistent anterior knee pain (AKP) is one of the major unsolved problems after TKA [8, 24]. Rotational alignment of the tibial and femoral components is an important factor influencing patellar tracking. A malpositioned femoral component increases the patellofemoral contact pressure, thus affecting the clinical outcome and the long-term survivorship of the implant [6, 12]. However, in patients with persistent AKP after TKA, the source of symptoms cannot be identified [2, 3, 14].

To the best of our knowledge, only a few papers exist concerning the treatment of AKP after TKA [1, 13, 17]. Most of these studies involve patients with different implant designs and other presenting symptoms. Furthermore, long-term results that predict the outcome after isolated secondary resurfacing of the patellar component are lacking [4, 16]. Therefore, the indication for patellar resurfacing in TKA needs to be defined. The aim of this retrospective study was to evaluate the clinical outcome after patellar resurfacing as a second stage procedure for AKP after TKA.

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Methods

We retrospectively reviewed a series of 22 consecutive patients (13 female, nine male) who underwent a secondary isolated patellar resurfacing procedure between 1999 and 2009. Some of the primary TKAs were performed in other clinics and all implants included were the Smith & Nephew Genesis I/II components designed for cruciate retaining and posterior stabilised prostheses. The implant chosen for the second stage resurfacing was a biconvex patella (Smith & Nephew, Schenefeld, Germany).

The average age of the patients was 60.4 ± 9.7 (SD 38–81) years at the time of operation. The mean period between total knee arthroplasty and patellar resurfacing was 26.3 ± 15.2 months. The mean follow-up was 61.8 ± 39.2 (SD 7–141) months. Inclusion criteria were persistent AKP after primary TKA, without improvement after conservative therapy. All patients were symptomatic during daily activities, such as kneeling, during sports and especially in ascending and descending stairs. A pre- and postoperative X-ray in lateral, skyline and anteroposterior views was performed to detect cases of lateralisation of the patella and to assess the patellofemoral joint (Figs. 1 and 2). We excluded patients with mechanical disorders and signs of deep infections by clinical examination and preoperative blood count, including measurement of the C-reactive protein.

All surgical procedures were performed by different consultants from our arthroplasty division using the previous incision and a standard medial parapatellar arthrotomy. Postoperatively, full weight-bearing was allowed in all cases and the drain was retained for 24 hours.

The assessment was done using the Knee Society Score (KSS) preoperatively and at the time of follow-up [11]. KSS consists of a 100-point scale for the knee score and a 100-point scale for the functional score. Subscales such as the range of motion and stability were rated with 25 points, whereas factors such as pain, walking ability and stair climbing were rated with 50 points. Furthermore, we evaluated the patient's satisfaction by a custom-made questionnaire which included three grades from satisfied to partially satisfied and not satisfied.

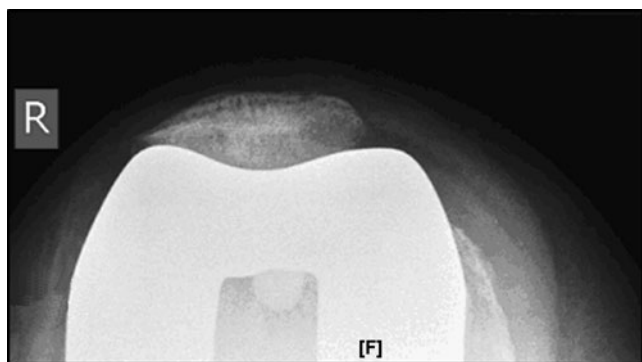


Fig. 1 Before resurfacing, skyline view

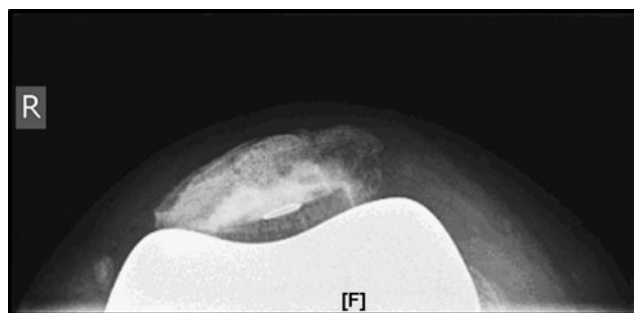


Fig. 2 After resurfacing, skyline view

The statistical analysis was performed with Student's *t* test for dependent samples after using the Kolmogorov-Smirnov test to check for normal distribution and the Levene test to determine the equality of variances.

Results

The mean KSS improved significantly from 60.1 ± 8.3 to 77.0 ± 6.3 ($p=0.0063$). In addition, the mean functional score also improved significantly from 42.7 ± 2.3 to 60.2 ± 3.9 ($p=0.001$). Furthermore, a custom-made questionnaire was used to detect whether or not the patients were satisfied with the surgical procedure performed. Eight patients (36.36%) indicated a good result, eight (36.36%) felt satisfied and six were dissatisfied (27.27%) and reported persistent AKP. In total, three patients (13.6%) from the same cohort of the dissatisfied patients ($n=6$) were revised, two with a dislocation of the patella and one with a postoperative haematoma. In both cases of dislocation a preoperative slight lateralisation of the patella was present which was allowed for the indication to resurface the patella. Furthermore, an extensive lateral release was performed intraoperatively. The haematoma which was revised was attributed to the thrombolytics administered for an embolism that occurred shortly after the operation.

A direct clinical or radiological explanation in three patients of the dissatisfied group could not be identified for the persistent AKP.

Discussion

The treatment of AKP poses a significant challenge in the management of these patients. In this study, we assessed the clinical outcome after resurfacing of the previous unresurfaced patella in TKA. We observed a significant improvement of the KSS and the functional score, although a subgroup of patients reported unsatisfactory results. These findings are in line with the currently available literature [1, 9, 13, 18, 19, 22].

Muoneke et al. reported an improvement of only 44.4% after secondary patellar resurfacing in TKA, although there

was an improvement in the KSS [18]. Parvizi et al. described an improvement in the clinical scores of the whole cohort (39 patients) but eight patients remained unsatisfied [22].

There is very little information available regarding the outcome of secondary patellar resurfacing. The existing studies, mostly based on small numbers of patients, have demonstrated contradictory results [10, 13, 18]. Therefore, the indication for patellar resurfacing is performed on an individual basis.

Various factors could influence our findings. It is known that patients with a shorter duration of AKP after TKA should have better clinical results than patients with a longer duration [13]. The time interval of 26 months between primary surgery and secondary patellar resurfacing reflects the preference of a conservative approach before undergoing a further surgery, which is in line with previous reports [18, 25].

Indeed, Helmy et al. used a decision tree model and postulated that the patella should be resurfaced during primary TKA to prevent a revision surgery for AKP [7, 10, 19, 23]. This suggests that the patella should be resurfaced in the primary TKA, as described by several authors [10, 19].

Our results revealed an improvement in a subgroup but not all patients. We acknowledge that the retrospective nature of this study cannot exclude potential selection bias. The latter could be the reason for the discrepancy observed between the clinical scores and the evaluation of the custom-made questionnaire.

Conclusions

Although clinical scores showed significant improvement some patients continued to have pain and remained dissatisfied without detecting a specific reason. The decision whether or not to resurface has to be discussed very critically with the patient. Secondary resurfacing of the patella after TKA cannot be considered a good option with regard to the patient's satisfaction and rate of are yet revision procedures. The criteria for performing patellar resurfacing to be determined and more studies are required to clarify this issue.

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