Isolated Lateral Patellofemoral Impingement as a Cause for Painful Total Knee Arthroplasty: Results of Operative Intervention

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Introduction
There is still controversy regarding whether or not to resurface the patella during primary total knee arthroplasty. However, when the decision to resurface the patella has been made, continued anterior knee pain postoperatively can be a challenging condition to treat. Prior studies have reported the incidence of continued anterior pain from 2% to 7%. The current body of literature regarding the etiology of anterior knee pain addresses component design, component position, and surgical technique. Algorithms have been presented in the past outlining the workup of the painful total knee. However, little attention has been given to lateral patellofemoral impingement as a possible source of the pain.

We report on a series of 19 total knee arthroplasties in 18 patients with postoperative anterior knee pain. The patella was resurfaced during the index procedure in all cases. Two of the index procedures were performed at our institution and 17 were performed at an outside institution. All 17 referred cases had been evaluated by an outside orthopedic surgeon who failed to diagnose the etiology of the pain. All patients were seen by one of two surgeons at our institution (DJ, SM) who diagnosed an overhanging lateral patellar facet resulting in lateral patellofemoral impingement (3 patients had medial and lateral facet disease). As this phenomenon has been seen in association with other etiologies of pain after total knee arthroplasty, all cases underwent a thorough workup to ensure that impingement was the only pathology present.

Materials and Methods
Approval for this study was obtained from the local institutional review board. Between 1/1/06 -1/1/08, a total of 18 patients with 19 painful total knee arthroplasties (11 right and 8 left) were seen at our institution. All patients described pain in the anterior aspect of the knee. All patients reported difficulties with stair climbing and rising from a chair. On examination, 8 patients localized the pain to the region of the lateral patellofemoral joint, and 8 patients had limited range of motion secondary to pain. The average patient age was 69.8 years (range 46-82). The average time from the index arthroplasty until presentation was 2.5 years (range 9 months-7 years).

All patients received three radiographs of the knee, including anterior-posterior, lateral, and sunrise views. Eleven patients brought outside radiographs for review; of these, only 1 included a sunrise view. Additional studies were performed as necessary to rule out the presence of other pathologies including infection, instability, and loosening of the components. Once the diagnosis of isolated lateral patellofemoral impingement was made, the risks, benefits, rational, and alternatives to either a lateral facetectomy or patellar revision based on intra-operative findings were discussed with the patients.

Surgical Technique
All 19 total knee arthroplasties were approached through their prior surgical incision. All underwent a medial parapatellar arthroscopy. Patella tracking was evaluated and an anterior synovectomy was performed. A lateral retinacular release was performed on 6 knees due to significant lateral maltracking. A quadricepsplasty was performed on 8 knees due to stiffness. The scar tissue surrounding the patella was removed to facilitate visualization of the medial and lateral patellar facets. In all cases, intra-operative findings revealed a sclerotic area of lateral patellar bone that articulated directly with the lateral condyle of the femoral component. If the resurfaced patellar thickness was appropriate with a mild degree of overhanging lateral facet, an isolated lateral facetectomy was performed with a high speed burr. This was performed in 15 knees. Three patients also had some degree of medial facet overhang and they underwent simultaneous medial and lateral facetectomies. The patellar dome was revised in 4 cases in which the surgeon subjectively felt that a larger patellar component would provide more adequate coverage and adequate patellar bone stock was present for revision. The wounds were closed in standard fashion.

Results
Knee Society Scores improved from a preoperative score of 66 (range 45-80) to a postoperative score of 93 (range 83-100) at 8 weeks. At 16 weeks the scores averaged 92 (range 72-100), and at 1 year follow-up, the scores averaged 88 (range 73-100). The pain score improved from a preoperative score of 21 (range 0-30) to a postoperative score of 46 (range 40-50) at 8 weeks, 45 (range 30-50) at 16 weeks, and 41 (range 30-50) at one year. The Function score improved from a preoperative score of 48 (range 20-70) to a postoperative score of 77 (range 50-100) at 8 weeks, 83 (range 60-100) at 16 weeks, and 80 (range 60-100) at one year. The postoperative scores all demonstrated statistically significant improvement from the preoperative level using a paired t-test (p<0.006 for all test statistics). Five patients were lost to follow-up at 16 weeks, and an additional 6 patients were lost to follow-up at 1 year. The 2 patients with the lowest 16 week scores ultimately went on to develop additional complications; one was diagnosed with tibial loosening and one with progressive instability at the 1 year mark.

Discussion
We believe that symptomatic lateral patellofemoral impingement after total knee arthroplasty remains an under-diagnosed etiology, and is far more common than originally believed. This may be due to a lack of attention in the literature in regards to this topic, or due to the failure to obtain the appropriate radiographic view. Doerr and Eckhoff in 1995 described a case report in which they revised a painful total knee arthroplasty for contact between an exposed lateral patellar facet and the femoral component. They warned against excessive medialization of the patellar component in order to avoid lateral facet overexposure. They also emphasized the importance of the sunrise radiograph, which was evident in our series as well. We believe that a careful history and physical exam is very important, including specific evaluation for tenderness about the medial and lateral patellar facets. This can be performed by laterally subluxing the patella and palpating the undersurface of the lateral facet. Additionally, a modified quadriceps inhibition test with pressure about the lateral aspect of the patella can be a helpful diagnostic modality.

In conclusion, we recommend that all surgeons evaluating a painful total knee arthroplasty be aware of the possibility of lateral patellofemoral impingement as a cause of anterior knee pain. Direct palpation of the lateral aspect of the patella during lateral patellar subluxation should be a routine part of every examination, and the sunrise view should be a standard portion of the radiographic evaluation of the total knee arthroplasty.

References

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