Worker compensation status increases the risk for presence of pain in the contralateral knee at final follow-up after arthroscopic knee surgery

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ABSTRACT

Objectives In patients undergoing arthroscopic knee surgery, it is not uncommon to complain of pain in both the ipsilateral and the contralateral knee. The primary aim of the present study was to evaluate the prevalence of contralateral knee pain in patients undergoing arthroscopic knee surgery. The secondary aim was to identify risk factors for contralateral knee pain in this population.

Methods All patient who underwent arthroscopic knee surgery between 2015 and 2017 were included. The prevalence of pain in the contralateral knee prior to and at the final follow-up after ipsilateral knee surgery was assessed. The following potential risk factors for contralateral knee pain were evaluated: age, gender, worker comp status, duration of symptoms, pre-operative diagnosis, activity level, history of a fall, use of a walking aid and findings during surgery.

Results A total of 142 patients met the inclusion criteria. The average age was 45±11 years, 104 patients (73%) were men. Prior to the surgery on the ipsilateral knee, only 1 patient (<1%) reported pain in the contralateral knee, which increased to 113 patients (80%) at final follow-up surgery. Of the assessed risk factors, only worker compensation status was significant for the development of contralateral knee pain (OR 2.93 95% CI 1.08 to 7.95, p=0.040).

Conclusion Pain in the contralateral knee is uncommon prior to arthroscopic knee surgery, but common after. The risk for the development of contralateral knee pain is increased if the index injury was workers compensation related.

Level of evidence Level IV case series.

INTRODUCTION

Knee arthroscopy is one of the most common surgeries performed by orthopaedic surgeons with procedures ranging from meniscal surgeries, ligament reconstruction, to cartilage restoration.1–7 In this patient population, there is the potential for a compensatory alteration of the gait kinematics leading to untoward affects. These alterations in the gait kinematics can lead to weakness, changes in range of motion, as well as pain in the contralateral knee. The alterations can continue into the postoperative period leaving the patient susceptible to the development of contralateral knee pain.8 In addition, if the condition of the ipsilateral knee is degenerative in nature, a similar condition may be present in the contralateral knee. This concept has not been previously reported on, leaving the surgeon with little data to counsel their patients on this potential postoperative phenomenon.

The development of contralateral knee pain in osteoarthritis patients undergoing knee arthroplasty has well been established.9–10 Data from the osteo-arthritis initiative evaluated subjects with bilateral pain-free knees, unilateral knee pain and bilateral knee pain, and found that physical function scores were significantly impacted by the presence of contralateral knee pain.11 Driban et al evaluated the association between ipsilateral and contralateral knee pain and the risk of a sustaining a new knee injury. Subjects who reported chronic knee symptoms in the contralateral knee were almost two times more likely to experience a new knee injury within the 12 months after surgery.12 Riddle and Stratford found that patients who have pain in both knees have lower self-reported pain and functional scores than those with unilateral knee pain.13 In addition, several studies on knee arthroplasty have documented that pain in the contralateral knee negatively affects the outcome of knee arthroplasty performed on the ipsilateral knee.9 14 These concepts have not been evaluated in patients undergoing knee arthroscopy and the prevalence of contralateral contralateral knee pain has not been reported.
The primary aim of the present study was to evaluate the prevalence of contralateral knee pain in patients undergoing arthroscopic knee surgery. The secondary aim was to identify risk factors for contralateral knee pain in this population. The primary hypothesis was that there is a high prevalence of contralateral knee pain in patients undergoing arthroscopic knee surgery. The secondary hypothesis was that several risk factors for developing this pain could be found.

METHODS
Prior to the start of this study, institutional review board (IRB) approval was obtained. We retrospectively identified all patients who underwent arthroscopic knee surgery between 2015 and 2017 by the senior author. Eligible procedure types included meniscus surgery, anterior or posterior cruciate ligament reconstruction and cartilage procedures. Following the index surgery, all patients were sent for formal physical therapy using the procedure specific rehabilitation protocol designed and used by the senior author. Weightbearing was only limited if a meniscal repair was performed, in which case, patients were partial weightbearing with the use of crutches for the first 5 weeks postoperatively.

At the initial consultation with the surgeon for the symptomatic knee, the surgeon routinely asked the patient if they had pain in the contralateral knee. This answer was documented as a binary value, that is, simple yes or no answer. This question was again asked at the final follow-up after the index procedure of the ipsilateral knee and the answer documented in the same fashion. The time frame of final follow-up depended on the index procedure performed (ie, minimum 6 months for knee arthroscopy with partial meniscectomy versus minimum 1-year follow-up for ACL reconstruction). The other knee was only worked up for pathology if requested by the patient at that time. The following potential risk factors for contralateral knee pain were evaluated: age, gender, worker comp status, duration of symptoms, preoperative diagnosis, activity level, history of a fall, use of a walking aid and findings during surgery. Exclusion criteria were skeletally immature patients and patients with a history of a fall, use of a walking aid and findings during surgery. Finally, it was recorded if the patient answered yes to the question about the presence of pain in the contralateral knee, both at the initial consultation and at the final follow-up. Patients were followed for a minimum of 6 months after the index procedure.

Outcomes
From the included patients, the chart was retrospectively reviewed and the following demographic information was recorded: age, gender and laterality of the injury. In addition, the following variables were extracted: whether the injury was workers compensation related, the duration of symptoms, preoperative diagnosis, activity level, history of a fall, use of a walking aid, and findings during surgery. Finally, it was recorded if the patient answered yes to the question about the presence of pain in the contralateral knee, both at the initial consultation and at the final follow-up. Patients were followed for a minimum of 6 months after the index procedure.

Statistical analysis
Descriptive statistics including mean, range and SD were calculated for all continuous variables after data were confirmed to have a normal distribution. If data were not normally distributed, median and range were reported. Ratios and percentages were calculated for the nominal variables. The prevalence of contralateral knee pain before and after the surgery on the ipsilateral knee was calculated. Logistical regression was applied to assess risk factors. Once a risk factor was identified, the OR with 95% CI were calculated for it. The p value for statistical significance was set at 0.05. All analyses were performed using SPSS V.24 by someone with experience in statistics.

RESULTS
A total of 150 patients were evaluated for inclusion in the study. Of those, 142 met the inclusion criteria. The average age was 45±11 years. One hundred and four patients (73%) were men, 77 (54%) were right knees and 121 (85%) involved a worker’s compensation injury. The median duration of symptoms was 78 weeks (range 4–963). A median number of prior surgeries was 0 (range 0–7). Follow-up ranged from 6 to 38 months after the ipsilateral knee surgery.

The diagnoses leading up the surgery for the included patients was a medial meniscus tear in 28 patients (20%), lateral meniscus tear in 2 patients (1%), anterior cruciate ligament injury in 33 patients (23%), chondromalacia in 23 patients (16%) and multiple causes in 56 patients (39%). In addition, to the main diagnosis, in most cases, associated pathology was found during surgery (table 1).

Prior to the surgery on the ipsilateral knee, only one patient (<1%) reported having pain in the contralateral knee. This number increased to 113 patients (80%) at the final follow-up after the index surgery. Logistic regression identified that age, duration of symptoms, pathology found in the operated knee, gender, laterality, activity level, fall history, use of assisted devices, limping and number or prior surgeries were not risk factors for developing pain in the contralateral knee. The only risk factor identified was workers compensation status (OR 2.93 [95% CI 1.08 to 7.95] p=0.040).

DISCUSSION
Although knee arthroscopy is a very common surgery performed by orthopaedic surgeons, and it is not uncommon for patients with a knee problem to complain of pain in both the affected knee and the contralateral knee, little is known about the prevalence of contralateral knee pain in patients undergoing knee arthroscopy. In the current study, we found that while prior to arthroscopic knee surgery, contralateral knee pain was uncommon, that 6–38 months postoperatively, it was very common.

These findings are consistent with the existing literature in the arthroplasty population. Ritter looked at the development of contralateral knee pain after unilateral primary total knee arthroplasty. Prior to the index surgery, 72% of patients had some arthritis in the contralateral knee. For the 38% with normal knees, the probability of the normal knee developing osteoarthritis and requiring a total knee arthroplasty at 7 years.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Findings during the surgery for the 142 included patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis</td>
<td>Number (percentage) of patients</td>
</tr>
<tr>
<td>Patellar chondromalacia</td>
<td>137 (97)</td>
</tr>
<tr>
<td>Trochlea chondromalacia</td>
<td>53 (37)</td>
</tr>
<tr>
<td>Medial femoral condyle chondromalacia</td>
<td>84 (59)</td>
</tr>
<tr>
<td>Medial tibial plateau chondromalacia</td>
<td>29 (20)</td>
</tr>
<tr>
<td>Lateral femoral condyle chondromalacia</td>
<td>29 (20)</td>
</tr>
<tr>
<td>Lateral tibial plateau chondromalacia</td>
<td>31 (22)</td>
</tr>
<tr>
<td>Medial meniscal tear</td>
<td>135 (95)</td>
</tr>
<tr>
<td>Lateral meniscal tear</td>
<td>90 (63)</td>
</tr>
<tr>
<td>Anterior cruciate ligament tear</td>
<td>37 (26)</td>
</tr>
<tr>
<td>Posterior cruciate ligament tear</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>
was 21% and 5%, respectively. In a study looking at patients undergoing unilateral total knee arthroplasty, Kahn et al found that 15% of patients had equal or greater Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) in the contralateral knee as in the ipsilateral knee. In their cohort, however, they did see the WOMAC score in the contralateral knee improve after surgery on in index knee (16 down to 14). In the present study, contralateral knee pain was more common after the index surgery. However, this was not graded using the WOMAC. Jones et al looked at predictors of poor function after total knee arthroplasty, and in their study found that the use of a walking device, predicted 6 month function. In the present study, this was not a risk factor for contralateral knee pain. Another study evaluated the development of contralateral knee pain and function after undergoing ipsilateral total knee arthroplasty. The contralateral limb weakened from 1 to 2 years, and further weakened from 2 to 3 years after ipsilateral knee arthroplasty. By 3 years, the contralateral limb was more painful compared with the ipsilateral operative limb and the contralateral knee pain contributed 44% of the variability in the 6 min walk and 33% of the variability in the stair climbing test.

The second important finding of the present study was that the risk for development of contralateral knee pain was increased if the index injury was workers compensation related. These findings are consistent with existing literature. Noyes and Barber-Westin compared outcomes of anterior cruciate ligament reconstruction between patients with and without workers compensation status. They found significant differences in the numbers of days off work (222 vs 37 days) and return to work (89% vs 100%). However, there were no differences for any of the objective outcomes, such as Lachman, anterior drawer or pivot shift. Barrett et al also showed that worker compensation patients undergoing anterior cruciate ligament reconstruction had uniformly worse subjective outcomes, visual analogue pain scores and Tegner scores. Interestingly enough, the present study did not find that the type of surgery that was performed was a risk factor for developing contralateral knee pain. This was unexpected as the authors thought that weight-bearing restrictions after certain procedures (meniscus repair, cartilage) may put more stress on the contralateral knee than after surgeries that do not have restricted weightbearing (meniscectomy and chondroplasty).

There are limitations to the current study. It was a retrospective design, although contralateral knee pain was prospectively documented in the chart. Clinical outcomes of the index surgery were not evaluated and therefore it was not possible to see if having contralateral knee pain affects the outcomes of the ipsilateral surgery. Contralateral knee pain was evaluated as either present or absent and was not quantified with a visual analogue scale, so the subjective severity of the pain was unable to be assessed. In addition, it was not assessed if the presence of contralateral knee pain affects patient self-reported function or satisfaction. The contralateral knee was not routinely worked up to find the etiology for the pain, unless this was requested by the patient. Lastly, minimum follow-up for the development of knee pain was 6 months, although follow-up ranged from 6 to 38 months.

The findings of this study are clinically relevant as it is the first study to show the prevalence of contralateral knee pain after knee arthroscopy. Although similar findings have been shown in the knee arthroplasty literature, this had not yet been reported with arthroscopic knee surgery. It is important as having pain in the contralateral knee has been shown to negatively affect outcomes and self-reported functional scores after the index procedure. The findings presented in this manuscript will help guide the preoperative conversation and help set a realistic expectation in patients undergoing routine knee arthroscopy. It is not thought to be suggested by these findings that having arthroscopic surgery on one knee causes pain in the other knee. It is likely that the contralateral knee pain existed pre-op and was not reported as the ipsilateral knee was more symptomatic. The degenerative nature of most of the conditions warranting the index surgery suggests that the presence of pain in the contralateral knee simply represents natural progression or that is was related to increased demand on the contralateral knee during the recovery of the ipsilateral knee. The study also identified risk factors for the development of contralateral knee pain. Knowing which patients are at risk can facilitate the development of preventive strategies.

CONCLUSION

In conclusion, our study showed that pain in the contralateral knee is uncommon prior to arthroscopic knee surgery, but common postoperatively. We also found that the risk for the development of contralateral knee pain is increased if the index injury was associated with a worker’s compensation claim. Future studies aimed at causation, prevention and intervention are needed to optimise outcomes.

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REFERENCES


