Preoperative Predictors of Patient-Reported Outcomes Following Arthroscopic Partial Meniscectomy

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Abstract

The purpose of this study is to evaluate the effect of patient demographics and injury characteristics on post-arthroscopic partial meniscectomy (post-APM) patient-reported outcomes (PROs). We hypothesize that the presence of high-grade (Kellgren–Lawrence grades 3–4) arthritis at any location of the knee (medial and lateral compartments, patella, trochlea), comorbidities (psychiatric history, chronic pain, diabetes, smoking, body mass index [BMI] $\geq$ 30), and lower scores on preoperative patient-reported measures (36-Item Short Form Health Survey [SF-36]) would predict poor outcomes after APM. We conducted a single-center prospective study of 92 patients who underwent APM surgery for associated knee pain. General demographic information and PROs were prospectively collected using SF-12, SF-36, and International Knee Documentation Committee (IKDC) surveys presurgery and at 6-month follow-up. Postsurgery outcomes were patient-reported satisfaction (yes/no) and obtaining a patient-acceptable symptom state (PASS) on IKDC. Data were analyzed with odds ratios (ORs), binomial logistic regression, and Mann–Whitney *U* test using IBM SPSS software. Demographic and injury characteristics that were poor prognostic indicators (had a decreased likelihood of obtaining PASS on IKDC postsurgery) included having Medicaid insurance (OR: 0.056; 0.003–1.00), chronic pain (OR: 0.106; 0.013–0.873), acute injury (OR: 0.387; 0.164–0.914), and high-grade (KL grades 3–4) medial compartment arthritis (OR: 0.412; 0.174–0.980), and preoperative SF-36 physical health score (PHS; $p = 0.023$) and mental health score (MHS; $p = 0.006$) values less than 47 and 48, respectively. Additionally, former smoking history (OR: 0.271; 0.079–0.928) showed a lower likelihood of being satisfied postsurgery. Not having psychiatric history (OR: 14.925; $p < 0.001$; increased likelihood of obtaining PASS on IKDC score postsurgery) and not having patellar arthritis (OR: 4.082; $p = 0.025$; increased likelihood of PASS on IKDC) were positive prognostic indicators. This study identifies predictive factors of poor outcomes post-APM; particularly, it highlights the usefulness of SF-36 surveys prior to APM surgery. Patients with low SF-36 score preoperatively may not find APM acceptable. Additional attention should be put on patient demographics (such as

Keywords

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psychiatric history, chronic pain, and insurance type) and injury characteristics (presence of arthritis and acute injury) prior to performing APM.
Level of Evidence II.

The clinical value of arthroscopic partial meniscectomy (APM) is a controversial topic among orthopaedic surgeons. APM is disputed due to the fine line between the postoperative improvement in patient-reported outcomes (PROs), the questionable long-term benefits, and what is deemed "best" for the given patient. Most of the controversy surrounds the heterogeneity of what falls under the title of meniscus tear, including acute injury and chronic tears in the setting of degenerative disease. A handful of studies report that in the short term (3–12 months postoperatively) PROs in terms of function and pain were significantly improved.[1–7] Evidence for the short-term effectiveness of APM is relatively clear, but the argument for maintaining long-term function via meniscal repair is more favored. The two most powerful arguments against APM are the increased peak contact loads in the tibiofemoral compartment following tissue removal[3,8–12] and the increased risk of total knee arthroplasty.[8,13–15] These facts should come as no surprise, as the excised tissue causes a dramatic decrease in contact area[9,11,12] and subsequent progression to osteoarthritis.[3,6,10,15–18] It is estimated that for healthy young adults, a partial APM results in a rate of cartilage loss as great as 7% per year.[3]

APM is still widely utilized because there are specific patient populations that do benefit from the operation, though the orthopaedic community has struggled to find a consensus on who should undergo APM. Additionally, some meniscal tears are simply not amenable to repair. The search for predictive factors has even been referred to as a "wild goose chase."[19] Current literature states that the patients most at risk of poor outcomes are those with an increased BMI,[2,5,8,20–22] female sex,[8,14,20,21] chondral damage,[8,21–23] osteoarthritis,[5,14,21,24] and possibly age older than 40 years.[20,23] For professional athletes who require immediate pain relief and a quick return to preinjury athleticism, APM serves as a viable option.[2,20] However, not every patient is an athlete—so the question remains as to what predictive factors in the general population can be used to select the right APM candidate.

Though previous studies have sought to address the controversy, there are few that have clearly identified predictors of postoperative outcomes from patient demographics, injury characteristics, or status of the remaining intra-articular structures of the knee, specifically for APM surgery. In addition, the current literature is largely comprised of retrospective studies or review articles and includes few prospective studies. This prospective study aims to identify predictors/risk factors of postoperative outcomes in patients undergoing APM and aid in clearing the muddy waters of who should or should not be offered this surgery. The study's purpose is to evaluate the effect of patient demographics and injury characteristics on post-APM patient-reported outcomes. We hypothesize that presence of high-grade (Kellgren–Lawrence [KL] grades 3–4) arthritis at any location of the knee (medial and lateral compartments, patella, trochlea), comorbidities (psychiatric history, chronic pain, diabetes, smoking), and lower scores on preoperative patient-reported measures (36-Item Short Form Health Survey [SF-36], International Knee Documentation Committee [IKDC], pain rating, functional status) would predict poor outcomes after APM.

Methods

This single-center prospective study consisted of 92 patients who underwent APM surgery for knee pain/pathology from 2021 to 2022 by one of four fellowship-trained orthopaedic surgeons. This study was approved by the University of Cincinnati institutional review board for retrospective analysis of prospectively collected data. Patients ≥18 years who were seen in the outpatient clinic setting for surgical treatment of meniscal tear were included in this study. Patients with lateral, medial, or both lateral and medial APM were included (frequencies listed in ►**Table 1**). All meniscus tears were diagnosed based upon a detailed patient history, focused physical examination, and subsequent advanced imaging via a magnetic resonance imaging (MRI). Tears were determined to be irreparable based upon tear morphology (white–white, zone, multidirectional, poor tissue quality, etc.) and hence a meniscectomy was offered to the patient after failure of a trail of nonoperative intervention (to include an intra-articular steroid injection coupled with physical therapy). Patients with and without mechanical symptoms were included. Tear morphology was then confirmed intraoperatively. General demographic information and patient-reported outcomes were prospectively collected using SF-12, SF-36, and IKDC surveys prior to surgery and at the 6-month follow-up. All 92 patients had follow-up. Preoperative demographic (►**Table 2**), clinical, and surgical information was collected via electronic medical records. This information included age, sex, body mass index (BMI), insurance, diabetes, smoking history, psychiatric history, chronic pain, acuity

Table 1 Location of arthroscopic partial meniscectomy

Location	No. of patients	Percent of total
Lateral	15	16.30
Medial	51	55.43
Lateral and medial	26	28.26
Total	92	100

Table 2 Patient characteristics

Variable	Mean or percent of patients	Standard deviation
Sex	44.6% male	–
Age (y)	52.54	13.06
BMI (kg/m^2)	30.42	6.16

Abbreviation: BMI, body mass index.

of injury (acute injury defined as <6 weeks), concomitant ligamentous injury, presence of patellar/trochlear/medial compartment/lateral compartment arthritis, and KL grade. KL grade was additionally grouped into "low-grade" and "high-grade" groups, which were grades 1 to 2 and 3 to 4, respectively. Psychiatric history was reported if a patient had a formal Diagnostic and Statistical Manual of Mental Disorders (5th edition) diagnosis (e.g., depression, anxiety, bipolar disorder, etc.) and/or was prescribed psychiatric medication. Two postsurgery outcomes were evaluated: (1) patient-reported satisfaction (answered "yes" or "no") and (2) obtaining a patient-acceptable symptom state (PASS) on postoperative IKDC score (equal to 57.9 for APM[25]).

Data were analyzed with odds ratios (ORs), binomial logistic regression, and Mann–Whitney *U* test using IBM SPSS software. ORs were run using both dichotomous independent and dependent variables, and an independence of observations was seen between compared groups. IBM SPSS reported 95% confidence intervals (CIs) for each OR (►**Tables 3** and **4**). Binomial logistic regression was performed to ascertain the effects of psychiatric history, acuity of injury, and the presence of patellar arthritis on the likelihood of obtaining a PASS on postoperative IKDC score. Linearity was assessed via the Box–Tidwell (1962) procedure. A Bonferroni correction was applied using all terms in the model resulting in statistical significance being accepted when $p < 0.00833$. Based on this, all variables were found to be linearly related to the logit of the dependent variable. Two standardized residuals, both with value of –2.628 standard deviations, were kept in the binomial logistic regression analysis (►**Table 5**). A Mann–Whitney *U* test was run to determine if there were differences in postoperative IKDC scores between patients with preoperative SF-36 physical health score (PHS) ≥47 or not, and between patients with preoperative mental health score (MHS) ≥48 or not. These specific score values were chosen as they are near the national average of SF-36 PHS and MHS, which is 50 for both. Additionally, a PHS value of 47 and an MHS value of 48 were where we noticed a difference in the IKDC postoperative scores and thus desired to determine if a statistically significant difference was found. Distributions of the postoperative IKDC scores for patients meeting the score cutoff or not were not similar, as assessed by visual inspection. Therefore, the IKDC postoperative score mean ranks were compared between groups (►**Table 6**) to assess for a statistically significant difference.

Post hoc power analyses were performed for each test to calculate the achieved power, and thus the potential type II error, with G*Power 3.1.9.7. An achieved power of 0.80 was considered adequate; however, the sample size of 92 patients was too small to achieve a power of 0.80. Therefore, the results are subject to type II error, and it cannot be concluded that the absence of statistical differences for some variables reflects a true lack of difference.

Results

In total, 92 patients were prospectively enrolled in the study who underwent APM surgery. Frequencies for location of meniscectomy are listed in ►**Table 1**. Patients had an average age of 52.54 ± 13.06 years and BMI of 30.42 ± 6.16 kg/m^2. In all, 44.6% of patients were males (►**Table 2**). All patients were prospectively followed for 6 months.

Table 3 Odds ratios of patient demographics on postmeniscectomy outcomes

Patient demographics	Patient-reported satisfaction (yes or no) postsurgery		Obtaining PASS on IKDC score postsurgery
	Odds ratio	95% CI	Odds ratio
Medicaid insurance	0.274	0.052, 1.439	0.056[a]
Diabetes	0.229	0.045, 1.168	0.538
Any history of smoking (current or former)	0.452	0.159, 1.284	0.328
Currently smoking	3.907	0.419, 36.414	0.750
Former smoking	0.271[a]	0.079, 0.928	0.354
BMI	0.986	0.921, 1.056	0.948
Psychiatric history	0.633	0.250, 1.602	0.091[a]
Chronic pain (including arthritis)	0.351	0.085, 1.454	0.106[a]

Abbreviations: BMI, body mass index; CI, confidence interval; IKDC, International Knee Documentation Committee; PASS, patient-acceptable symptom state.
[a]Significant values.

Table 4 Odds ratios of injury characteristics on postmeniscectomy outcomes

Injury characteristics	Frequency	% of total	Patient-reported satisfaction (yes or no) postsurgery		Obtaining PASS on IKDC score postsurgery	
			Odds ratio	95% CI	Odds ratio	95% CI
Acute injury	50	54.3	0.489	0.208, 1.147	0.387[a]	0.164, 0.914
Ligamentous injury	4	4.3	0.092	0.005, 1.769	0.116	0.006, 2.227
Presence of any patellar arthritis (KL grades 1–4)	67	72.8	0.443	0.167, 1.176	0.325[a]	0.122, 0.868
Patellar arthritis KL grade 1	13	14.1	0.750	0.230, 2.443	1.407	0.432, 4.585
Patellar arthritis KL grade 2	19	20.7	0.772	0.267, 2.229	0.562	0.187, 1.682
Low-grade patellar arthritis (KL grades 1–2)	32	34.8	0.717	0.302, 1.704	0.833	0.350, 1.985
Patellar arthritis KL grade 3	31	33.7	1.333	0.540, 3.291	0.802	0.325, 1.979
Patellar arthritis KL grade 4	9	9.8	0.336	0.062, 1.836	0.431	0.079, 2.350
High-grade patellar arthritis (KL grades 3–4)	36	39.1	0.949	0.406, 2.217	0.643	0.272, 1.517
Presence of any lateral compartment arthritis (KL grades 1–4)	43	46.7	0.707	0.308, 1.624	0.432[a]	0.185, 1.012
Lateral compartment arthritis KL grade 1	6	6.5	1.907	0.331, 10.979	0.550	0.096, 3.167
Lateral compartment arthritis KL grade 2	10	10.9	0.574	0.150, 2.189	1.162	0.312, 4.330
Low-grade lateral compartment arthritis (KL grades 1–2)	16	17.4	0.897	0.304, 2.645	0.867	0.292, 2.573
Lateral compartment arthritis KL grade 3	18	19.6	0.775	0.269, 2.231	0.405	0.130, 1.267
Lateral compartment arthritis KL grade 4	4	4.3	0.911	0.123, 6.767	0.366	0.037, 3.658
High-grade lateral compartment arthritis (KL grades 3–4)	22	23.9	0.786	0.296, 2.092	0.367	0.127, 1.056
Presence of any medial compartment arthritis (KL grades 1–4)	66	71.7	0.587	0.232, 1.488	0.535	0.213, 1.346
Medial compartment arthritis KL grade 1	4	4.3	2.864	0.286, 28.629	1.150	0.155, 8.542
Medial compartment arthritis KL grade 2	18	19.6	0.677	0.240, 1.913	1.182	0.420, 3.232
Low-grade medial compartment arthritis (KL grades 1–2)	22	23.9	0.889	0.340, 2.326	1.194	0.456, 3.125
Medial compartment arthritis KL grade 3	27	29.3	0.570	0.227, 1.433	0.625	0.247, 1.584
Medial compartment arthritis KL grade 4	13	14.1	0.902	0.268, 3.044	0.333	0.084, 1.325
High-grade medial compartment arthritis (KL grades 3–4)	40	43.5	0.594	0.255, 1.380	0.412[a]	0.174, 0.980
Presence of any trochlear arthritis (KL grades 1–4)	47	51.1	0.759	0.331, 1.740	0.707	0.308, 1.624
Trochlear arthritis KL grade 1	5	5.4	1.396	0.222, 8.788	1.776	0.282, 11.191

Table 4 (*Continued*)

Injury characteristics	Frequency	% of total	Patient-reported satisfaction (yes or no) postsurgery		Obtaining PASS on IKDC score postsurgery	
			Odds ratio	95% CI	Odds ratio	95% CI
Trochlea arthritis KL grade 2	14	15.2	1.077	0.331, 3.507	1.407	0.432, 4.585
Low-grade trochlear arthritis (KL grades 1–2)	19	20.7	1.182	0.419, 3.339	1.563	0.553, 4.418
Trochlear arthritis KL grade 3	18	19.6	1.389	0.475, 4.058	1.024	0.354, 2.956
Trochlear arthritis KL grade 4	10	10.9	0.902	0.242, 3.368	0.739	0.193, 2.824
High-grade trochlear arthritis (KL grades 3–4)	28	30.4	1.211	0.490, 2.995	0.880	0.356, 2.177

Abbreviation: CI, confidence interval; IKDC, International Knee Documentation Committee; KL, Kellgren–Lawrence; PASS, patient-acceptable symptom state.
[a]Significant values.

Table 5 Binomial logistic regression of postoperative IKDC score PASS

Variable	*B*	Standard error	Degrees of freedom	*p* value	Odds ratio	Inverted odds ratio
Constant	1.943	0.631	1	0.002	6.976	
Psychiatric history	−2.696	0.754	1	<0.001[a]	0.067	14.925[b]
Acute injury	−0.802	0.505	1	0.112	0.449	
Presence of patellar arthritis	−1.408	0.630	1	0.025[a]	0.245	4.082[b]

Abbreviation: PASS, patient-acceptable symptom state.
[a]Significant values.
[b]Inverted odds ratio reflects odds of obtaining PASS on postoperative IKDC score if the patient does NOT have listed variables.

Table 6 Mann–Whitney *U* test of IKDC postoperative scores between patient groups attaining cutoff preoperative SF-36 scores

SF-36 section	PHS or MHS value cutoff	IKDC score mean rank	*p* value
PHS	≥47	62.32	0.023[a]
	<47	43.16	
MHS	≥48	49.01	0.006[a]
	<48	29.25	

Abbreviations: IKDC, International Knee Documentation Committee; MHS, mental health score; PHS, physical health score; SF-36, 36-Item Short Form Health Survey.
[a]Significant values.

Effects of Patient Demographics on APM Outcomes (Obtaining PASS; Satisfied after Surgery)

ORs of patient demographics are listed in ►**Table 3**, which quantify their effect on both patient satisfaction and IKDC passing score post-APM. No patient demographics had higher odds of obtaining a PASS on postoperative IKDC score or of patient-reported satisfaction after APM. The demographics that had lower odds of obtaining a PASS on postoperative IKDC score were Medicaid insurance (OR = 0.056; 95% CI: 0.003, 1.001), having a history of psychiatric illness (OR = 0.091; 95% CI: 0.025, 0.335), and presence of chronic pain (OR = 0.106; 95% CI: 0.013, 0.873). Being a former smoker had lower odds of being satisfied postsurgery (OR = 0.271; 95% CI: 0.079, 0.928; ►**Table 3**).

Effects of Injury Characteristics on APM Outcomes (Obtaining PASS; Satisfied after Surgery)

Frequencies and ORs of injury characteristics are listed in ►**Table 4**. No characteristics were found to have higher odds of obtaining a PASS on postoperative IKDC score. Characteristics that were found to have lower odds of obtaining a PASS on postoperative IKDC score were patients with an acute injury (OR = 0.387; 95% CI: 0.164, 0.914), any grade of patellar arthritis (OR = 0.325; 95% CI: 0.122, 0.868), and high-grade (KL grades 3–4) medial compartment arthritis (OR = 0.412; 95% CI: 0.174, 0.980). Specific KL grades of arthritis were not significant predictors of outcome (neither positive nor negative prognostic indicators). No injury characteristics were found to

be significant predictors of patient-reported satisfaction (►**Table 4**).

Binomial Logistic Regression: Independent Predictive Factors of Obtaining PASS

To further elucidate poor prognostic indicators post-APM (using PASS on IKDC score as marker of good outcome), a binomial logistic regression was performed. The regression ascertained the effects of the presence of psychiatric history, presence of acute injury, and the presence of patellar arthritis on the likelihood of obtaining a PASS on postoperative IKDC score. The logistic regression model was statistically significant, $\chi^2(3) = 27.313$, $p < 0.001$. The model explained 35.3% (Nagelkerke R^2) of the variance in postoperative IKDC scores and correctly classified 70.8% of cases. Sensitivity was 64.3%, specificity was 76.6%, positive predictive value was 71.1%, and negative predictive value was 70.1%. Of the three variables, only two were statistically significant: presence of psychiatric history and presence of patellar arthritis (as shown in ►**Table 5**). These data were then used to calculate the inverse ORs, which determined two positive prognostic indicators: having *no* history of psychiatric illness and having *no* patellar arthritis (of any KL grade). Patients *without* a psychiatric history had 14.92 higher odds of obtaining a PASS on postoperative IKDC score than patients with psychiatric history. Patients *without* the presence of patellar arthritis (of any grade) had 4.08 higher odds of obtaining a PASS on postoperative IKDC score than patients with the presence of patellar arthritis (►**Table 5**).

Association of Preoperative SF-36 Scores with Postoperative IKDC Scores

As assessed by Mann–Whitney *U* test, postoperative IKDC scores for patients with preoperative SF-36 PHS ≥47 (mean rank = 62.32) were statistically significantly higher than those for patients who scored less than 47 (mean rank = 43.16; $p = 0.023$). Postoperative IKDC scores for patients with preoperative SF-36 MHS ≥48 (mean rank = 49.01) were statistically significantly higher than those for patients who scored less than 48 (mean rank = 29.25; $p = 0.006$; ►**Table 6**).

Summary of Results

Postoperative IKDC score and patient satisfaction were analyzed to uncover the predictive factors of outcomes post-APM. Patient demographic characteristics that were poor prognostic indicators were having Medicaid insurance, psychiatric history, chronic pain, former smoking history, and preoperative SF-36 PHS (<47) and MHS (<48) values. The following injury characteristics were poor prognostic indicators: acute injury, patellar arthritis (all KL grades), and high-grade (KL grades 3–4) medial compartment arthritis. Additionally, two positive prognostic indicators were having *no* history of psychiatric illness and having *no* patellar arthritis.

Discussion

This dataset identifies pertinent patient demographics and injury characteristics that are predictors for post-APM outcomes (such as obtaining a PASS on postoperative IKDC score and patient-reported satisfaction). Many of the risk factors found in this study have not been studied or identified in the current literature.

Psychiatric history and presence of patellar arthritis (any KL grade) were poor prognostic indicators and had a decreased likelihood of patients obtaining a PASS on postoperative IKDC score. We did not find a statistically significant difference in the OR for patients who were obese (BMI ≥ 30 kg/m^2) in contrast to the current literature. However, our study followed patients for a shorter period than studies reporting obesity as a poor prognostic indicator (6 months vs. 1–2 years).[5,21] It is most likely that as the obese group of patients gets farther out from APM, and the longer their joint surface is exposed to increased force with loss of meniscal tissue, the lower their IKDC score and satisfaction will be.

The patient demographics of chronic pain and Medicaid insurance were both found to have a lower likelihood of achieving a PASS on IKDC score post-APM. Injury characteristics that were also found to be poor prognostic indicators were an acute injury, presence of patellar arthritis, and high-grade (KL grade 3–4) medial compartment arthritis. Chronic pain at baseline likely starts the patient at a lower level in terms of mental and physical health, making it more difficult to reach the passing IKDC score. Medicaid insurance, due to the population it services, is known to correlate with patient populations that are depraved and less healthy than patients who are privately insured.[26] This factor emphasizes the impact of a patient's preoperative health status on their outcomes from APM. Worse knee injuries may lead to patients presenting to the surgeon's office more acutely and thus explain why acute presentation was found to be a predictor of not reaching PASS on postoperative IKDC score. Patellar, medial compartment, and lateral compartment arthritis having less desirable outcomes (when measured by a PASS score) aligns with the current literature that APM causes an increase in the contact area and loss of cartilage in the knee joint. Therefore, patients who preoperatively have arthritis may experience worse outcomes as the loss of meniscal tissue quickens the arthritis progression; this finding supports current literature that higher preoperative KL grades have worse outcomes following APM.[27,28]

When it comes to patient-reported satisfaction postoperatively, only one predictive factor was identified: being a former smoker. Interestingly, being a former smoker had decreased odds of being satisfied postoperatively yet being either a current smoker or having any smoking history did not prove to be significant.

A similar study, attempting to determine which patients have clinical improvement after APM (determined as meeting minimal clinically important difference [MCID]) found that shorter symptom duration, lower KL grade, and lower preoperative PROs were associated with higher likelihood of good outcomes at 1 year postoperatively.[27] This agrees with our findings, although we found additional predictive factors for good outcomes, as previously outlined. Additionally, our analysis uncovered that lower preoperative SF-36 PHS and MHS scores predicted worse outcomes, which has not been

previously reported. The lower the preoperative PHS and/or MHS values, the lower the postoperative IKDC score. The point at which the difference in postoperative IKDC scores became statistically significant was 47 for the PHS subsection and 48 for the MHS subsection. The score of 50 on both the PHS and MHS subsections is the mean score for the U.S. general population; therefore, if a patient preoperatively scores similar to or higher than the general population on SF-36, they are more likely to have higher postoperative IKDC scores after APM. The PHS value reflects not solely knee pain/symptoms such as IKDC score but also the overall physical health of the patient. Patients with better physical health prior to surgery most likely have fewer comorbid conditions preoperatively and hence fewer outside influences affecting their knee function. Therefore, APM could alleviate functional knee issues and allow for higher postoperative IKDC score. Going along with higher preoperative MHS values (better mental state) leading to higher postoperative IKDC scores, patients *without* a psychiatric history had remarkably increased odds of obtaining a PASS post-APM. This has not been previously reported in the literature surrounding APM. These findings highlight the importance of both the overall physical and mental health of the patient prior to undergoing APM, emphasizing the well-being of the patient. This stresses empathy and setting expectations by the orthopaedic surgeon when considering APM in the patient population affected by psychiatric diagnoses. Though a patient should not be denied necessary surgery, it may be important to address the psychiatric disease prior to or concomitantly with operative treatment. Therefore, we recommend using the SF-36 questionnaire before surgery to gain insights into how a patient might fare after APM.

Limitations

The study had limitations that must be noted. These included the small sample size, which led to an underpowered study (as determined by post hoc power analysis) and the inability to control for surgical experience as patients were treated by any one of four fellowship-trained sports medicine surgeons. With this being an underpowered study, there is a propensity of type II error (failing to find a difference where there is one).

Conclusion

This study identifies predictive factors for whether or not patients are more likely to obtain favorable outcomes post-APM (determined as either obtaining PASS on IKDC or reporting satisfaction after surgery). Particularly, it highlights the usefulness of SF-36 prior to APM surgery. Both the PHS and MHS scores can be a gauge of whether patients will have a favorable outcome, as higher PHS and MHS preoperatively had statistically significantly higher postoperative IKDC scores. Special attention should be put on patient demographics (such as psychiatric history, chronic pain, and insurance type) and injury characteristics (presence of arthritis and acute injury) prior to performing APM. These predictive factors will help orthopaedic surgeons select low-risk and appropriate patients to undergo APM, leading to improved patient outcomes as well as elucidating the appropriate use criteria for this surgery.

Ethical Approval

This study was approved by the University of Cincinnati Institutional Review Board (IRB ID: 2021–0246).

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None.

Conflict of Interest

None declared.

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