

Factors Associated With Physician Loss in Anterior Cruciate Ligament Reconstruction Malpractice Lawsuits

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Background: Anterior cruciate ligament (ACL) reconstruction is among the most common orthopaedic procedures, with its incidence doubling over the past decade. To date, no studies have analyzed litigation after ACL reconstruction.

Purpose: To characterize the causes of malpractice litigation after ACL reconstruction.

Study Design: Cross-sectional study.

Methods: A retrospective review of malpractice lawsuits after ACL reconstruction was performed using VerdictSearch, a large legal claims database encompassing nearly 180,000 legal cases, from February 1988 to May 2015. Settlement rates and physician loss rates were calculated along with 95% CIs for each complication type, and analysis of variance was used to compare all indemnity payments.

Results: Of a total 30 lawsuits, 5 (16.7%) settled out of court. The 3 most common complications leading to litigation were prolonged pain ($n = 5$, 16.7%), infection ($n = 5$, 16.7%), and malpositioned graft ($n = 5$, 16.7%). Of the 25 cases that went to court, 8 (32.0%) ended in favor of the plaintiff (physician loss). Damage to a neurovascular structure resulted in the highest indemnity payment (mean, \$2,012,926 \pm \$1,076,530; $P = .021$). Lawsuits for which pain or loss of range of motion was the only complication were significantly more likely to end in a physician victory ($P = .04$) and lower indemnity payments (\$87,500 vs \$678,715, respectively). Cases that involved a surgical technical error were more likely to result in a physician loss ($P = .01$), with malpositioned grafts having a significantly higher loss rate than average (75% vs 32%, respectively).

Conclusion: After ACL reconstruction, physicians are more likely to win malpractice suits if pain or limited range of motion is the only complaint and less likely to win if a surgical error was alleged. These findings may help to set patient expectations and provide adequate guidance during the informed consent process.

Keywords: ACL reconstruction; litigation; lawsuit; law; complications

Anterior cruciate ligament (ACL) injuries are among the most common injuries encountered by orthopaedic surgeons, with an annual incidence of 68.6 per 100,000 person-years.^{21,24} ACL reconstruction has been shown to decrease the need for further surgery for meniscal injuries, with patients experiencing less decline in their functional activity levels.³ The incidence of ACL reconstruction within the first year after an injury has risen dramatically, from 40% in the early 1990s to nearly 80% over the past decade.^{2,17} Therefore, with nearly 130,000 ACL reconstructions occurring annually, ACL injuries represent a major source of potential litigation for the practicing surgeon.¹⁷

Recent studies have shown that orthopaedic surgeons are at an increased risk of litigation, with nearly 14% of surgeons experiencing a lawsuit annually compared with the national physician average of 7%.^{1,14} While several European studies have examined the frequency of orthopaedic malpractice claims in an effort to reduce litigation, little is known regarding orthopaedic malpractice claims in the United States.^{12,16,18} Nevertheless, complications and malpractice claims are a reality for orthopaedic sports medicine surgeons. Indeed, complications may occur in as many as 1.3% of ACL reconstructions.^{4,5,13,15}

To date, no studies have analyzed the characteristics of litigation after ACL reconstruction in the United States. In this study, we sought to describe the most common reasons for litigation after ACL reconstruction and to assess factors contributing to unfavorable rulings. We hypothesized that surgical technical errors and the occurrence of death would

The Orthopaedic Journal of Sports Medicine, 5(11), 2325967117738957

DOI: 10.1177/2325967117738957

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be associated with greater physician loss and higher indemnity payments in cases going to trial.

METHODS

Data Collection

This study represents a retrospective review of the VerdictSearch (ALM Media Properties) database. VerdictSearch is a large legal claims database, encompassing nearly 180,000 legal cases from February 1988 to May 2015. Of the 180,000 claims indexed in VerdictSearch, 22,074 represent cases of medical malpractice. This database has been previously used and validated in studies of both compartment syndrome and spinal surgery.^{6,7} The database was queried using the term “anterior cruciate ligament,” and all malpractice cases that occurred after primary ACL reconstruction were included. Patients of all ages were included. Cases were excluded if there was missing or incomplete information.

Data including age and sex of the patient, nature of the complication, death, settlement out of court, and amount awarded (indemnity payment) were collected. For those cases that did not reach a settlement out of court, the court decision was categorized as a decision for the plaintiff (physician loss) or a decision in favor of the defendant (physician win). For cases that settled out of court, there was no decision in favor of the plaintiff or the defendant. For each lawsuit, the complication leading to litigation was further defined as an alleged surgical technical error if it involved damage to a neurovascular structure during the surgical approach, a malpositioned graft, or a malpositioned interference screw.

Statistical Analysis

The relationship between complication type, an alleged surgical technical error, and death were compared with both out-of-court settlements and physician loss for cases going to trial using the chi-square test. The Fisher exact test was used with expected counts less than 5. Settlement rates and physician loss rates were calculated along with 95% CIs for each complication type. Indemnity payments were compared using the independent *t* test and analysis of variance. Finally, the independent-samples *Z* test was used to assess for significant differences between independent proportions. *P* = .05 was used to determine significance for all tests (SPSS version 21; IBM Corp).

TABLE 1
Case Characteristics for Lawsuits After
Anterior Cruciate Ligament Reconstruction^a

Variable	n (%)
Total lawsuits	30 (100.0)
Sex of plaintiff	
Male	13 (43.3)
Female	17 (56.7)
Trial status	
Settled	5 (16.7)
Went to trial	25 (83.3)
Trial outcome	
Physician won	17 (68.0)
Physician lost	8 (32.0)
Complication	
Pain alone	5 (16.7)
Infection	5 (16.7)
Malpositioned graft	5 (16.7)
Pain and decreased ROM	3 (10.0)
Neurovascular injury	3 (10.0)
Pulmonary embolus	3 (10.0)
Malpositioned screw	2 (6.7)
Limited ROM alone	1 (3.3)
Graft failure	1 (3.3)
Patellar fracture	1 (3.3)
Complex regional pain syndrome	1 (3.3)

^aROM, range of motion.

RESULTS

Case Characteristics

In total, there were 30 lawsuits after ACL reconstruction (Table 1). The mean age of the plaintiffs was 31.9 ± 11.1 years, with 13 male plaintiffs (43.3%) and 17 female plaintiffs (56.7%). There were a total of 5 cases that resulted in settlement (16.7%). Of the 25 cases that ultimately went to court, 17 (68.0%) ended in a decision in favor of the defendant (physician win), and 8 (32.0%) ended in favor of the plaintiff (physician loss). The 3 most common complications leading to litigation (Table 1) were prolonged pain (5 cases, 16.7%; mean age of plaintiff, 35.0 years), infection (5 cases, 16.7%; mean age of plaintiff, 28.8 years), and malpositioned graft (5 cases, 16.7%; mean age of plaintiff, 29.8 years), followed by knee pain with decreased range of motion (ROM) (3 cases, 10.0%), neurovascular injury (3 cases, 10.0%), pulmonary embolus (3 cases, 10.0%), malpositioned interference screw (2 cases, 6.7%), limited ROM only (1 case, 3.3%), graft failure with

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One or more of the authors has declared the following potential conflict of interest or source of funding: This study was funded in part by a grant from the Orthopaedic Research and Education Foundation to B.O. J.M.D. receives education support from Stryker. A.H.D. receives education support from DePuy and is a paid consultant for Osseous, Stryker, and Globus Medical. B.O. is a consultant for Mitek and Conmed Linvatec/Musculoskeletal Transplant Foundation.

Ethical approval was not sought for the present study.

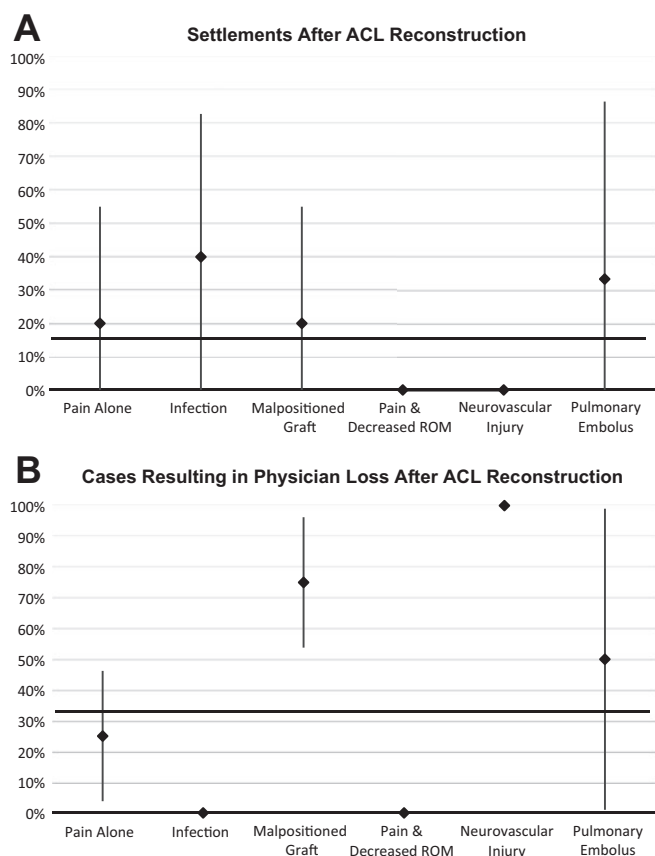


Figure 1. 95% CIs of the percentage of cases resulting in (A) a settlement and (B) a physician loss for each complication after anterior cruciate ligament (ACL) reconstruction. Mean rates are indicated by a horizontal black line. ROM, range of motion.

recurrent instability (1 case, 3.3%), patellar fracture (1 case, 3.3%), and complex regional pain syndrome (1 case, 3.3%). There were no instances of persistent instability leading to malpractice litigation.

There was no significant difference in the amount paid out for cases that ended in settlement (\$1,004,300 ± \$702,747) versus those that went to court (\$424,409 ± \$794,131) (*P* = .14). While there was no diagnosis with a significantly different settlement rate (Figure 1A), an alleged malpositioned graft had a significantly higher physician loss compared with the average (75% vs 32%, respectively) (Figure 1B). Damage to a neurovascular structure (with 1 instance of a popliteal artery injury) resulted in the highest indemnity payment (\$2,012,926 ± \$1,076,530; *P* = .021), significantly more than all other complications with the exception of the next 2 highest payments: pulmonary embolus (\$1,130,462 ± \$979,018) and infection (\$499,800 ± \$770,471).

Lawsuits With Pain and Loss of ROM Only

In total, there were 8 (26.7%) lawsuits in which the complication was limited to pain and loss of ROM only. These lawsuits were not more likely to settle than to go to trial

TABLE 2
Indemnity Payments for Lawsuits After Anterior Cruciate Ligament Reconstruction^a

Variable	Indemnity Payment, \$	<i>P</i> Value
Trial status		.14
Settled	1,004,300 ± 702,747	
Went to trial	424,409 ± 794,131	
Pain/limited ROM only		.008
Yes	87,500 ± 247,487	
No	678,715 ± 873,762	
Surgical error made		.046
Yes	844,667 ± 987,784	
No	333,704 ± 142,410	
Death		.75
Yes	850,000 ± 1,202,801	
No	497,561 ± 789,635	

^aValues are shown as mean ± SD. ROM, range of motion.

(*P* = .60) but were more likely to end in a physician victory (*P* = .04). For cases of pain and limited ROM only that went to trial, the jury found in favor of the surgeon 100.0% of the time compared with 55.6% of the time with all other complications, a difference that was statistically significant (*P* = .02). Finally, indemnity payments for pain and loss of ROM only were significantly lower (\$87,500 ± \$247,487) than for all other complications (\$678,715 ± \$873,762) (*P* = .008) (Table 2).

Lawsuits With an Alleged Surgical Technical Error

Eleven cases (36.7%) involved an alleged technical error (5 malpositioned grafts, 3 neurovascular injuries during the approach, 2 malpositioned interference screws, and 1 patellar fracture). These lawsuits were not more likely to settle than to go to trial (*P* = .62) but were significantly more likely to end in a physician loss (*P* = .01). For cases that went to trial, the jury found in favor of the plaintiff 87.5% of the time compared with 33.3% of the time with all other complications, a difference that was statistically significant (*P* < .001). Finally, indemnity payments for cases with a technical error were significantly greater (\$844,667 ± \$987,784) than all other complications (\$333,704 ± \$142,410) (*P* = .046) (Table 2).

Lawsuits With Death

There were a total of 2 lawsuits (6.7%) in which the patient died, both a result of a pulmonary embolus. These were not more likely to result in an out-of-court settlement (*P* = .31), were not more likely to result in a physician loss (*P* = .68), and did not result in statistically significant higher indemnity payments (\$850,000 ± \$1,202,801 vs \$497,561 ± \$789,635) (*P* = .75).

DISCUSSION

While orthopaedic surgeons experience malpractice litigation at nearly twice the rate of the average physician, little

research has been conducted to further investigate these claims in an effort to reduce the burden of malpractice.^{9,14} Although the orthopaedic community has responded by pressing for malpractice “caps” to limit indemnity payments for complaints of “pain and suffering” alone, the recent literature has shown that these caps are least likely to affect surgical subspecialties.^{21,25} In this study, we found that 36.7% of lawsuits after ACL reconstruction were the result of pain or loss of ROM alone. These results are similar to the findings of McWilliams et al,²⁰ who showed that there are an increasing number of lawsuits for general dissatisfaction after total joint reconstruction. Similarly, in our study, nearly 63% of lawsuits were based on complications that involved no technical error on behalf of the surgeon, further highlighting the need for malpractice reform. Finally, 26.7% of lawsuits were related to pain and loss of ROM. While VerdictSearch does not provide specific information about rehabilitation protocols or postoperative exercises, it is possible that some of these lawsuits could have been avoided through patient education regarding the role of postoperative rehabilitation.

ACL reconstruction represents a prime area for malpractice research. Not only is the incidence of ACL reconstruction increasing rapidly, but several studies have also indicated that patient education before ACL reconstruction still remains inadequate.^{4,11} For example, Cailliez et al² found that, while 100% of patients undergoing ACL reconstruction understood the diagnosis, only 80% understood the surgical procedure, and only 70% could recount the possible complications associated with the surgery. Further research has shown that while online resources are commonly utilized before undergoing ACL reconstruction, these resources are rarely comprehensive and may even be misleading.^{8,11} This lack of detailed information regarding the possibility of postoperative complications or arthrofibrosis may be a driver of postoperative litigation and highlights the critical importance of informed consent. In addition to the described causes of litigation above, it is essential that surgeons also discuss the possibility of the lack of therapeutic relief from the surgical intervention, as nearly 63% of lawsuits in this study did not involve a known technical error.

While preoperative consent and patient education are imperative, surgeons must also be aware of the complications that predispose to successful litigation. In their study of patients undergoing vascular surgery, Markides et al¹⁹ found that intraoperative errors were the most likely to result in successful lawsuits, resulting in a payment to the plaintiff nearly twice as often as for postoperative complications. Similarly, in this study, we found that an alleged surgical technical error was significantly more likely to result in a physician loss for cases going to trial and to result in a higher indemnity payment. On the contrary, patients who sued for pain or loss of ROM only were much less likely to win at trial and received smaller payments on average.

The 2 instances of death in this study both occurred as a direct result of a pulmonary embolus, one of the most common complications after ACL reconstruction.¹⁰ Interestingly, in this study, death did not increase the chance of

successful litigation, again supporting the notion that routinely discussed postoperative complications are less likely to result in indemnity payments, even with the ultimate outcome of death.²³

It must be noted that this study has inherent strengths and weaknesses. With only a total of 30 lawsuits, it is possible that this cohort represents only a small subset of the total ACL litigation cases. Furthermore, while the database was queried for cases of litigation after ACL reconstruction, it is also possible that some instances were missed, given the lack of clinical guidance from medical professionals when documenting the lawsuits. Nevertheless, VerdictSearch represents a very large database that has been used and validated in many published closed-claims analyses. Furthermore, with only 2 instances of death, the study may not be adequately powered to conclude that ACL reconstruction complicated by death is less likely to result in successful litigation. Finally, because the VerdictSearch database is not maintained by physicians or people with a medical background, it is difficult to assess if a surgical technical error was truly made or merely alleged. Along these lines, without significant clinical guidance, this database lacks details about the patients' postoperative outcomes or status in additional medical malpractice suits. Nevertheless, while a true surgical error may not have been made, alleging such an error may have an equally disastrous impact on the defendant's reputation in the mind of the jury.

With regard to strengths of the study, VerdictSearch represents a reliable database encompassing nearly 180,000 data claims that has been used to assess litigation after many surgical procedures in the United States.^{22,26} Finally, this study represents the first to examine the most common causes of litigation after ACL reconstruction and the factors that predispose to successful lawsuits, although future research is required.

CONCLUSION

For cases of litigation in ACL reconstruction, an alleged surgical technical error was more likely to result in a physician loss, while pain or loss of ROM alone was more likely to result in a physician win with lower indemnity payments. Overall, 63% of lawsuits did not involve a technical error on the part of the surgeon. These findings may help to set patient expectations and provide adequate guidance during the informed consent process. Future research must continue to characterize litigation after orthopaedic surgery in an effort to achieve malpractice reform.

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