

[Athletic Training]

Psychological Rehabilitation From Anterior Cruciate Ligament–Medial Collateral Ligament Reconstructive Surgery: A Case Study

Siobhain McArdle, PhD

Background: Research has shown that some of the more common psychological responses to injury (ie, depression, anger, anxiety) are amplified in cases of traumatic injury.

Hypothesis/Purpose: An 18-year-old male scholarship soccer player who, owing to a perceived deliberate injurious tackle by an opposition player, tore the medial collateral ligament and anterior cruciate ligament of his right knee. A psychological case perspective is presented.

Study Design: Retrospective case report.

Results: Various personal and situational factors can compound negative psychological response to injury. A number of extreme responses are explored, including posttraumatic stress, depression, and fear of reinjury.

Conclusions: Practitioners should be willing and able to facilitate referral in the instance of more extreme psychological response to anterior cruciate ligament injury.

Keywords: anterior cruciate ligament injury; psychology; culpability; fear of reinjury; posttraumatic stress

Research suggests that approximately 80 000 Americans sustain acute tearing of the anterior cruciate ligament (ACL) each year.¹⁷ Treatment for young active individuals who incur ACL tears often involves reconstructive surgery followed by a course of physical therapy. The seriousness and severity of the ACL injury are reflected in the intensive, extended physical rehabilitation process that is essential for optimal outcome.²⁹

More recent understanding of physical trauma recognizes that physical and psychological trauma are not mutually exclusive but often occur together.³³ Research has shown that some of the more common psychological responses to injury (ie, depression, anger, anxiety) are amplified in cases of more severe injury, such as a traumatic ACL injury.⁴ Negative psychological response

to injury has been linked to less-than-optimal adherence and rehabilitation outcomes.^{8,38} Consequently, in the case of an ACL injury, sports medicine practitioners should be aware of instances in which patient referral may be required.²⁷

An 18-year-old male scholarship soccer player who, owing to a perceived deliberate injurious tackle by an opposition player, tore the medial collateral ligament (MCL) and ACL of his right knee. The player was informed that the data concerning his case would be submitted for publication, and he consented. To increase the validity of the report, the player was asked to read through the case to ensure that he was not misrepresented in any way. To protect the anonymity of the player, the type of team sport in which he participated has been changed.

From Dublin City University, Dublin, Ireland

Address correspondence to Siobhain McArdle, PhD, School of Health and Human Performance, Dublin City University, Dublin, 9, Ireland (e-mail: siobhain.mcardle@dcu.ie).

No potential conflict of interest declared.

DOI: 10.1177/1941738109357173

© 2010 The Author(s)

CASE REPORT

An 18-year-old male scholarship athlete in his first year of university initially sought psychological support approximately 3 months after MCL and ACL reconstructive surgery on his right knee. The MCL-ACL tear sustained by the soccer player was his first experience of injury. In describing the occurrence of the injury, the player stated that it occurred during a game early in the competitive season. He believed that the injury was the result of a deliberate injurious tackle by an opposition player. He indicated that his perception of how the injury occurred was confirmed by teammates and others watching the game at the time. The player was visibly angry regarding how he sustained his injury, and he expressed this anger toward the player who tackled him. He felt cheated out of a competitive season and, possibly, a future in soccer. His anger toward his culpable opponent was so intense that he expressed a desire to injure the culpable party once he was playing competitive soccer again.

The player also exhibited signs of mild to moderate depressed mood. He reported having little interest in socializing or engaging in other activities that he had once found enjoyable, and he stated that there were days where he did not want to speak to or see anyone. He also indicated that he could not envision a future without soccer and that his life had little meaning if he could not play. In his own words, he “felt depressed.” When asked about his support network, the player acknowledged that he had a number of sources of social support, including his father, his managers, his teammates, and his physiotherapist.

The player also presented with symptoms of posttraumatic stress. He indicated that since his injury (approximately 4 months), he had been having flashbacks to the injurious tackle. The flashbacks occurred during day and night and were accompanied by a perceived increase in heart rate. The flashbacks affected his concentration and disturbed his sleep. The player expressed a desire to avoid attending team training and socializing with his teammates. He also indicated that since the injury, he could not watch team sports without anticipating the incidence of an ACL tear. He stated that the constant flashbacks heightened his anxiety about reinjury. When probed about his fear of reinjury, the player clearly indicated that he had no fear of reinjuring himself while performing his rehabilitation exercises. His physiotherapist confirmed that the player diligently adhered to his rehabilitation program and was progressing at a faster-than-average rate. In this instance, it became clear that the player's fear of reinjury was linked to game-specific situations, such as tackling.

A confidential case conference with a senior psychologist confirmed the view that the player was demonstrating signs of moderate to clinical levels of depression and showing signs of posttraumatic stress. Psychological response to injury is in many ways unique in that athletes with serious injuries cycle through a number of debilitating moods and responses during the initial stages of rehabilitation.^{20,37} However, theory, research, and anecdotal evidence have shown that with time

most injured athletes accept the reality of the situation and develop more positive coping responses and behaviors.²⁰ It was agreed that the player should continue to be monitored with the understanding that he should be referred to a specialist if his symptoms remained unchanged.

Research suggests that adherence to rehabilitation and decreases in self-reported disability, pain intensity, and depression are facilitated by increasing the patient's perceptions of control over his or her recovery.^{12,21} In addition, increasing the patient's self-efficacy often reduces the intensity of the patient's symptoms and facilitates other interventions.³⁶ Consequently, the intervention in this instance was initially guided by the player's personal goals for treatment, which included addressing his fear of reinjury and addressing his anger. In total, the treatment consisted of five 60- to 90-minute sessions. The fifth session commenced before the client's reintroduction to team training (approximately 4 months after the initial session).

The course of the intervention was broken down into 3 components:

Education and normalization: educating the player on the interventions employed and normalizing his response to injury

Application: giving the player intervention-linked tasks to complete

Intervention termination: ending the treatment at the point where the player demonstrated acceptance of the injury and positive injury management and coping skills

Because fear of reinjury, anger, depression, and posttraumatic stress are interrelated, each session worked toward moving the athlete to complete psychological recovery.

INTERVENTIONS

Cognitive-behavioral therapy is used to treat negative mood, anger, fear of injury, and symptoms of posttraumatic stress disorder.^{26,36,39} The tenets of such therapy argue that maladaptive cognitions create negative mood states and dysfunctional behaviors.⁵ The purpose of the therapy is to break the cycle of maladaptive thoughts, behaviors, and emotions exhibited by the client.¹ *Disputing* in cognitive-behavioral therapy is based on the scientific principle that hypotheses are either accepted or refuted depending on objective evidence. Dysfunctional thoughts and images are disputed by systematically questioning the reality of the thought and image. The objective is to guide the client toward evidence that will falsify rather than verify dysfunctional inferences made from thoughts and images and to ask the client to identify alternative conclusions based on objective evidence. In this instance, disputing was used to address posttraumatic stress, fear of reinjury, and the client's catastrophic thinking about his future career prospects. In this process, informal modeling was used to emphasize that

full recovery was possible.¹³ The player was asked to think about or talk to other athletes and soccer players who had successfully returned to sport after ACL reconstruction. As in interventions used to treat posttraumatic stress, the player was asked to recount the details of the injurious tackle and his cognitive and emotional response to the injury.³⁶ His reactions to the incident were normalized, and he was encouraged to identify personal coping skills that he could use in his recovery process.

In addition, fear of reinjury and posttraumatic stress were addressed through the process of systematic self-desensitization.⁴⁴ In this intervention, the client was asked to develop a fear hierarchy—specifically, a list of approximately 15 feared situations. Situations that elicit the least amount of fear are placed at the bottom of the list, and those that elicit the most amount of fear at the top. The client was asked to progressively engage with each feared situation starting at the bottom of the hierarchy. If the client could imagine the scene without feeling anxious, he was asked to move on to the next feared situation on the hierarchy. Systematic self-desensitization for anxiety, stress, and pain-related fear has proven to be successful in both the sport and medical domains.^{31,40}

To address the player's anger and desire for revenge, *time projection* was employed.¹⁶ Time projection involves the individual imagining himself or herself in the future or in the past. In rehabilitation, it is used to motivate the client to see himself or herself at a future stage in rehabilitation or to retrospectively reflect on progress made over the course of rehabilitation (both physical and psychological). In this instance and as part of his homework, the player was asked to imagine himself fully recovered and playing against the opponent that he thought was responsible for his injury. He was instructed to imagine executing an injurious tackle on his opponent, then his feelings subsequent to the tackle. Questions that he was asked to reflect on included “Does your anger go away?” “Do you feel better now?” “How do your teammates react?” “How does your coach react?” and “What does your father say to you after the game?” On his next visit to the clinic, the player indicated that his anger had lessened considerably and that he was not quite sure whether deliberately injuring another player would make him feel any better.

By the fifth session (4 months after the initial meeting), the client indicated that his flashbacks had decreased considerably. He was now attending team training, and he limited his participation to the guidelines set out by his physiotherapist. He indicated that his day-to-day mood had improved and that he no longer wished to injure his opponent. He also said that his fear of reinjury had diminished but was not completely gone. He was reassured that in many cases of ACL reconstruction, fear of reinjury is still present even when the athlete is given permission to return to sport.^{23,25} In many cases, the initial task for the athlete is to manage and positively cope with the fear rather than expect its complete eradication. To address his continued fear of reinjury, the player was

advised to use the principle of incremental loading to guide his return to competition. For example, he was advised to begin training with players at a lower competitive level until he regained strength and rebuilt his performance confidence. He was advised to progressively incorporate tackling into training and then gradually incorporate more and more tackling into competitive situations as he increased his game fitness and confidence. By the fifth session, the player demonstrated good self-awareness and positive coping skills. It was agreed that the player was in a position to return to competitive sport and that a follow-up session would take place after the athlete started playing competitively once again.

DISCUSSION

No physical injury can occur without psychological consequences, and these are largely contingent on personal and situational factors.^{41,42} Athletes who strongly identify with their athletic role have been shown to be more likely to suffer negative mood disturbances when injured as compared to athletes whose sport participation is not integral to their identity.⁷ Physiotherapists have identified intensity of athletic involvement as a major factor affecting psychological response to injury.³⁰ In this instance, the player's high athletic identity, in addition to his status as a scholarship athlete, may have exacerbated his response to the injury. Given that research has shown moderate to severe postinjury depression rates, ranging from 5% to 21%,^{9,10,24,28,32} the practitioner needs to be aware of factors that might exacerbate negative response to injury. The practitioner must also recognize that in addition to the more typical signs of depression (such as crying and feelings of hopelessness), depression in athletes may present itself through anger, frustration, and anxiety. All possible signs of depression should be monitored, and referral to an appropriate source should be made if symptoms persist.⁴

Culpability and issues related to guilt and blame for injury are infrequently discussed in sports psychology. Research with general medical populations has indicated that culpability is a risk factor in treatment. Culpability has been linked with increased perceptions of pain, greater emotional disturbance, and less successful rehabilitation outcomes.^{11,43} Research has suggested that when an injury results from an intent to do harm, especially in conjunction with a rule violation or when the behavior of the offender goes unpunished, the psychological response of the injured athlete is more likely to be extreme.¹⁹ In some instances of injury, coaches are the target of blame. If the coach encouraged the athlete to return to play too soon or to overtrain, recovery from injury is likely to be complicated by the realization that after rehabilitation, the athlete will be returning to work with the same coach.¹⁹ When the circumstances of the injury involve perceived culpability of some sort, one primary intervention goal is to provide the athlete with the support and expertise that he or she needs to work through the anger and reach a stage of acceptance.¹⁹

Fear of reinjury can range from mild concern to a range of maladaptive psychological outcomes and disorders (ie, depression, anger, anxiety disorder, psychophysiological disorders).¹⁵ At the extreme end of the negative continuum is *kinesiophobia*, defined as “an excessive, irrational, and debilitating fear of physical movement and activity resulting from a feeling of vulnerability to painful injury or reinjury.”²² Research suggests that knee function, pain, and sociopsychological factors such as fear of reinjury play a role in the athlete’s successful return to sport.^{6,18,23,25} Fear elicits elevated levels of physiological arousal leading to increased muscle tension, fatigue, and decreased coordination, thus escalating the individual’s susceptibility to injury.^{3,19} Fear of reinjury may also elicit muscular guarding, which affects body symmetry, also increasing vulnerability to injury.¹⁹ Given that anxiety of reinjury is a psychological barrier to returning to sports, particularly with ACL injuries, practitioners should be aware of and monitor fear of reinjury in ACL patients.

More recently, the literature has highlighted the reality of posttraumatic stress in response to catastrophic or traumatic injury.^{4,14} The *Diagnostic and Statistical Manual of the American Psychiatric Association* (fourth edition) outlines a comprehensive definition of posttraumatic stress disorder. Some of the diagnostic criteria of posttraumatic stress disorder include (1) exposure to a traumatic event that involves serious injury, actual or threatened death, or perceived threat to oneself or others; (2) a response to the traumatic event that involves fear, helplessness, or horror; (3) a traumatic event that is reexperienced in a number of ways, such as recurring and intrusive recollections of the event, recurring and distressing dreams of the event; (4) efforts to avoid activities, places, people, thoughts, or feelings that are associated with the incident; and (5) difficulty falling or staying asleep, irritability or outburst of anger, difficulty concentrating, hypervigilance, and an exaggerated startle response.² Awareness of the potential for posttraumatic stress with the occurrence of a traumatic injury is important for sports medicine personnel for a number of reasons. Posttraumatic stress can evolve into posttraumatic stress disorder if the symptoms last more than a month.⁴ Without an awareness of posttraumatic stress disorder, sports professionals may misdiagnose the signs and symptoms of posttraumatic stress.⁴ Although sports medicine personnel may think of posttraumatic stress disorder as a trauma-based disorder with little relevance in the sports domain, the prevalence for posttraumatic stress following injury is at least 9% of the general US population.³⁵ These statistics highlight the likelihood of encountering posttraumatic stress and the importance of knowing when and how to intervene in such cases.

CONCLUSION

A number of novel cognitive and affective factors contribute to successful rehabilitation following ACL reconstructive surgery.³⁸ Various personal and situational factors can compound negative psychological response to injury.⁴² Psychological

response to injury can range from mild mood disturbance to more extreme responses, such as posttraumatic stress.^{4,42} An increasing number of practitioners and researchers acknowledge that although an orthopaedic surgeon or physician should not be expected to provide treatment for more extreme responses to injury, he or she should be willing and able to facilitate referral if necessary.^{4,34}

REFERENCES

1. Agras WS, Apple RF. *Overcoming Eating Disorders: A Therapist Guide*. San Antonio, TX: Graywind Publications; 1997.
2. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 4th ed. Washington, DC: American Psychiatric Association; 1994.
3. Anderson MB, Williams JM. A model of stress and athletic injury: prediction and prevention. *J Sport Exerc Psychol*. 1988;10:29-306.
4. Asken MJ. Counseling athletes with catastrophic injury and illness. In: Ray R, Wiese-Bjornstal DM, eds. *Counseling in Sports Medicine*. Champaign, IL: Human Kinetics; 1999:293-309.
5. Beck AT, Rush AJ, Shaw BF, Emery G. *Cognitive Therapy for Depression*. New York, NY: Guilford Press; 1979.
6. Bjordal JM, Arnoy F, Hannestad B, Strand T. Epidemiology of anterior cruciate ligament injuries in soccer. *Am J Sports Med*. 1997;25:341-345.
7. Brewer BW. Self-identity and specific vulnerability to depressed mood. *J Pers*. 1993;61:343-364.
8. Brewer BW, Cornelius AE, Van Raalte L, et al. Attributions for recovery and adherence to rehabilitation following anterior cruciate ligament reconstruction: a prospective analysis. *Psychol Health*. 2000;15:283-291.
9. Brewer BW, Linder DE, Phelps CM. Situational correlates of emotional adjustment to athletic injury. *Clin J Sport Med*. 1995;5:241-245.
10. Brewer BW, Petrie TA. A comparison between injured and uninjured football players on selected psychosocial variables. *Acad Athl J*. 1995;10:11-18.
11. DeGood DE, Kiernan BD. Pain related cognition as predictors of pain treatment outcome. *Adv Med Psychol*. 1997-1998;9:73-90.
12. Fisher AC. Counseling for improved rehabilitation adherence. In: Ray R, Wiese-Bjornstal DM, eds. *Counseling in Sports Medicine*. Champaign, IL: Human Kinetics; 1999:275-292.
13. Flint FA. Modeling in injury rehabilitation. In: Pargman D, ed. *Psychological Bases of Sport Injuries*. Morgantown, WV: Fitness Information Technology; 1999:221-234.
14. Gardner F, Moore Z. *Clinical Sport Psychology*. Champaign, IL: Human Kinetics; 2006.
15. Gatchel RJ, Dersh J. Psychosocial perspective on chronic pain. In: Turk DC, Gatchel RJ, eds. *Psychological Approaches to Pain Management: A Practitioner's Handbook*. 2nd ed. New York, NY: Guilford Press; 2002:30-52.
16. Green LB. The use of imagery in the rehabilitation of injured athletes. *Sport Psychol*. 1992;6:416-428.
17. Griffin LY, Agel J, Albohm MJ, et al. Noncontact anterior cruciate ligament injuries: risk factors and prevention strategies. *J Am Acad Orthop Surg*. 2000;18:141-150.
18. Gobbi A, Franciso R. Factors affecting return to sports after anterior cruciate ligament reconstruction with patellar and hamstring graft: a prospective clinical investigation. *Knee Surg Sports Traumatol Arthrosc*. 2006;14:1021-1028.
19. Heil J. The injured athlete. In: Hanin YL, ed. *Emotions in Sport*. Champaign, IL: Human Kinetics; 2000:245-267.
20. Henschen KP, Shelley GA. 1999. Counseling athletes with permanent disabilities. In: Ray R, Wiese-Bjornstal DM, eds. *Counseling in Sports Medicine*. Champaign, IL: Human Kinetics; 1999:293-309.
21. Jensen MP, Turner JA, Roman JM. Changes in beliefs, catastrophizing and coping are associated with improvement in multidisciplinary pain treatment. *J Consult Clin Psychol*. 2001;69:655-662.
22. Kori SH, Miller RP, Todd DD. Kinesiophobia: a new view of chronic pain behaviour. *Pain Manag*. 1990;3:35-43.
23. Kvist J, Ek A, Sporrstedt K, Lars G. Fear of re-injury: a hindrance for returning to sports after anterior cruciate ligament reconstruction. *Knee Surg Sports Traumatol Arthrosc*. 2005;13:393-397.

24. Leddy MH, Lambert MJ, Ogles BM. Psychological consequences of athletic injury among high-level competitors. *Res Q Exerc Sport*. 1994;65:347-354.
25. Lee DYH, Abdul Karim S, Chong Chang H. Return to sports after anterior cruciate ligament reconstruction: a review of patients with minimum 5-year follow-up. *Ann Acad Med Singapore*. 2008;37:273-278.
26. Lohnberg JA. A review of outcome studies on cognitive-behavioral therapy for reducing fear-avoidance beliefs among individuals with chronic pain. *J Clin Psychol Med Settings*. 2007;14:113-122.
27. Mann BJ, Grana WA, Indelicato PA, O'Neill DF, George SZ. A survey of sports medicine physicians regarding psychological issues in patient-athletes. *Am J Sports Med*. 2007;35:2140-2147.
28. Manuel JC, Shilt JS, Curl WW, et al. Coping with sports injuries: an examination of the adolescent athlete. *J Adolesc Health*. 2002;31:391-393.
29. Paulos LE, Wnorowski DC, Beck CL. Rehabilitation following knee surgery. *Sports Med*. 1991;11:257-275.
30. Pearson L, Jones G. Emotional effects of sports injuries: implications for physiotherapists. *Physiotherapy*. 1992;78:762-770.
31. Perna F, Neyer M, Murphy SM, Ogilvie BC, Murphy A. Consultations with sport organizations: a cognitive-behavioral model. In: Murphy S, ed. *Sport Psychology Interventions*. Champaign, IL: Human Kinetics; 1995:236-252.
32. Petrie TA, Brewer BW, Buntrock C. A comparison between injured and uninjured NCAA Division I male and female athletes on selected psychosocial variables. *J Appl Sport Psychol*. 1997;9:S144.
33. Raphael B, Wooding S. Debriefing: its evolution and current status. *Psychiatr Clin North Am*. 2004;27:407-423.
34. Reider B. Sound mind, sound body. *Am J Sports Med*. 2007;35:1995-1996.
35. Resnick H, Kilpatrick D, Dansky B, Saunders B, Best C. Prevalence of civilian post-traumatic stress disorder in a representative national sample of women. *J Consult Clin Psychol*. 1993;61:984-991.
36. Scott MJ, Stradling SG. *Counselling for Post-traumatic Stress Disorder*. London: Sage Publications; 2006.
37. Smith AM, Scott SG, O'Fallon WM, Young ML. Emotional responses of athletes to injury. *Mayo Clin Proc*. 1990;65:38-50.
38. Tripp DA, Stanish W, Ebel-Lam A, Brewer BW, Birchard J. Fear of reinjury, negative affect and catastrophizing predicting return to sport in recreational athletes with anterior cruciate ligament injuries at 1 year postsurgery. *Rehabil Psychol*. 2007;52:74-81.
39. Trower P, Casey A, Dryden W. *Cognitive-Behavioural Counseling in Action*. London: Sage Publications; 2004.
40. Vlaeyan JW, de Jong J, Sieben J, Crombez G. Graded exposure in vivo for pain-related fear. In: Turk DC, Gatchel RJ, eds. *Psychological Approaches to Pain Management: A Practitioner's Handbook*. 2nd ed. New York, NY: Guildford Press; 2002:210-234.
41. Wiese DM, Weiss MR. Psychological rehabilitation and physical injury: implications for the sportsmedicine team. *Sport Psychol*. 1987;1:318-330.
42. Wiese-Bjornstal DM, Shaffer SM. Psychosocial dimensions of sport injury. In: Ray R, Wiese-Bjornstal DM, eds. *Counselling in Sports Medicine*. Champaign, IL: Human Kinetics; 1999:21-40.
43. Williams DA. Acute procedural and postoperative pain: patient related factors in its undermanagement. *Am Pain Soc Bull*. 1997;4:8-10.
44. Wolpe J. *Psychotherapy by Reciprocal Inhibition*. Stanford, CA: Stanford University Press; 1958.

For reprints and permission queries, please visit SAGE's Web site at <http://www.sagepub.com/journalsPermissions.nav>.