



Return to Sport Following Femoroacetabular Impingement Syndrome

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Femoroacetabular impingement (FAI) can present with debilitating symptoms in an athlete, affecting both their level of performance and activities of daily life. The prevalence of FAI in the athletic population is greater than in the general population, but the reasons are unknown. The rate of return to sport following surgery for FAI has been a popular research topic, and results have been promising. However, there are still a significant number of athletes who do not return to their sport. Additionally, the rate of return to previous level of competition has largely been neglected in the literature, which is arguably more important than the rate of return to sport. The literature is varied regarding radiographic assessment of FAI, patient reported outcome measures, time to follow-up, and overall methodological quality. This chapter aims to review risk factors for failure of return to sport, and predictors affecting the return to previous level of competition in the athlete after FAI treatment.

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Introduction

Femoroacetabular impingement (FAI) can present with debilitating symptoms in an athlete, affecting both activities of daily living and athletic performance. FAI can affect athletes of all levels across a broad range of sports. FAI refers to premature bony abutment between the proximal femur and acetabulum at end hip ranges of motion, particularly in flexion and internal rotation.¹ This abnormal contact is related to bony deformity of the femoral neck (cam deformity), anterior acetabulum (pincer deformity), or a combination of both. Repetitive contact can lead to labral damage, cartilage delamination, and can potentially place the athlete at risk for early onset arthritis.² Athletes with FAI are placed at an increased risk of developing symptoms relative to the general population secondary to repetitive extreme ranges of

hip motion and high-impact activity as demanded by their sport.^{3,4}

Surgical correction of FAI aims to address intra-articular pathology and reshape the bony abnormalities to prevent persistent impingement. A host of literature has shown hip arthroscopy to be successful in treating symptomatic FAI, with outcomes equal or better compared to open procedures.^{5,6} Although there are many recent studies that show overall good outcomes after surgery in athletes with FAI, there is still a significant number of athletes who do not return to their sport or previous level of competition.^{3,7} This chapter aims to review risk factors for failure of return to sport, and predictors affecting the return to previous level of competition.

Demographics and Prevalence of FAI in the Athletic Population

Several studies have identified a higher prevalence of FAI in the athletic population than in the general population.⁸⁻¹¹ A systematic review by Frank et al found cam deformities in 37%-54% of the asymptomatic athletic population and 23%

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in the asymptomatic general population.¹⁰ Another systematic review further subdivided between symptomatic and asymptomatic patients and found that cam deformities were significantly more common in the athletic population as compared to the asymptomatic general population, but not when compared to the symptomatic general population.¹¹

Studies comparing the prevalence of FAI between specific sports are limited.¹² Based on current literature that focuses on a single sport, we can extrapolate that some sports have a higher prevalence of FAI than others (Table 1). Sports with the highest prevalence of FAI tend to be ones that require pivoting and cutting, repetitive hip flexion, adduction and internal rotation, or supraphysiologic hip ranges of motion.^{3,4,13} Examples of these sports include soccer, ice hockey, and gymnastics, respectively. A cross-sectional study on 130 elite ice hockey players revealed that 70% of hips had evidence of cam deformity on at least one side, and 60% of the players had bilateral involvement.¹⁴ Kicking sports, such as soccer, tend to have a relatively higher prevalence of subspine impingement, or abutment of the anterior inferior iliac spine against the femoral neck, secondary to the sport's demand of repetitive, high hip flexion. Nawabi et al found a significantly greater rate of subspine impingement in high-level soccer players (84%) as opposed to athletes in nonkicking sports (54%).¹⁵

Other sports with a notably high prevalence of FAI are football, basketball, and dance.¹⁶⁻¹⁸ In a group of 134 hips in male collegiate football players, 95% had at least one sign of cam or pincer impingement and 77% had more than one sign, with at least moderate interobserver and intraobserver repeatability.¹⁶ Some less commonly considered sports with documented FAI are rowers, cyclists, swimmers and overhead athletes, like lacrosse and baseball.¹⁹⁻²²

There are documented differences in the prevalence of FAI between male and female athletes. Males tend to have more of a cam deformity than females. Gerhardt revealed that 70% of male elite soccer players had evidence of FAI vs 50% of female elite soccer players.²³ Kapron et al performed a cross-sectional study on 129 hips of division 1 female athletes and found that 48% had radiographic parameters consistent with cam deformity, 1% had evidence of pincer deformity, 21% met parameters for acetabular dysplasia (lateral center edge angle $<20^\circ$), and 46% met parameters for borderline acetabular dysplasia (lateral center edge angle $\geq 20^\circ$ and $\leq 25^\circ$). Overall, they found that female athletes had a lower

prevalence of FAI but a higher occurrence of acetabular dysplasia as compared to prior studies on male athletes.²⁴ Another study on dancers found a significantly greater prevalence of borderline dysplasia in female dancers (92%) than in male dancers (74%).¹⁸ Male dancers were found to have a greater prevalence of cam deformity than female dancers (57% vs 12%, respectively).

Radiographic Assessment of FAI

A variety of radiographic angles are used to detect the presence of FAI.²⁵ The alpha angle is measured on a Dunn (45° or 90°), frog leg lateral, or cross-table lateral view, is used to assess the presence of an anterior cam deformity. It is obtained by drawing one line down the center of the femoral neck to the center of a best-fit circle, and a second line anterior from the center of the circle to the point where the femoral cortex extends beyond the best-fit circle (Fig. 1).

The lateral center-edge angle of Wiberg is one of many angles used to assess for the degree of acetabular coverage. On an anteroposterior pelvis radiograph, the angle is made by a line parallel to the longitudinal pelvic axis and a line is drawn from the center of the femoral head to the lateral edge of the acetabulum (Fig. 2). The Sharp angle is measured by drawing a horizontal line between the inferior borders of each hip's teardrop (indicates the inferior projection of the floor of the acetabular fossa) and another line to the lateral edge of the acetabular roof (Fig. 2). The anterior center-edge angle is measured on the false-profile view of the hip. One vertical line is drawn through the center of the femoral head, and a second line is drawn to the most anterior aspect of the acetabulum (Fig. 3).

The radiographic parameters to diagnose FAI are not well defined in the literature.¹⁰ Authors set different thresholds

Table 1 Prevalence of FAI by Sport

Sport	Prevalence of FAI (%)	References
Football	94-95	16,32
Soccer	56-84	23,27,29
Ice hockey	69-75	12,14
Basketball	89	17
Dance	31-72	18
Skiing	42	12

Summary of prevalence of femoroacetabular impingement (FAI) as portrayed in the literature by sport, with references.
FAI, femoroacetabular impingement.



Figure 1 Alpha angle measurement.

Frog leg lateral radiograph of a right hip demonstrating the alpha angle measurement. Copyright AJS.

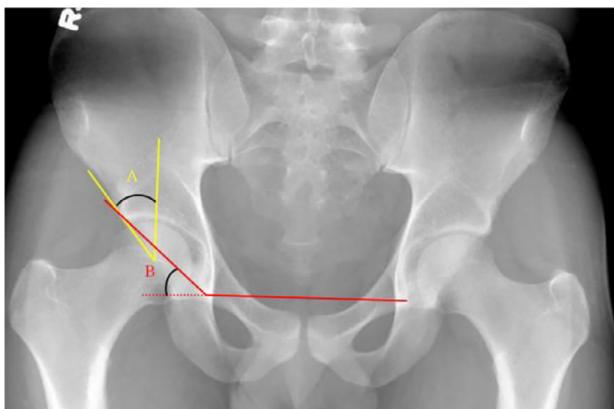


Figure 2 Acetabular metrics on anteroposterior pelvis radiograph.

Plain film acetabular metrics depicted on an anteroposterior (AP) pelvis radiograph. (A) Lateral center-edge (LCE) angle of Wiberg. (B) Sharp angle. Copyright AJS.

for determining what is considered FAI (ie, alpha angle minimum of 55° vs 65° to diagnose a cam lesion). Different radiographic signs are used to detect pincer deformities, such as the crossover sign, lateral center-edge angle, posterior wall sign, ischial spine sign, coxa profunda, and acetabular index. There is not a consensus for the clinical relevance of these measurements.²⁶ Additionally, various modes of imaging are used to obtain these FAI measurements, ranging from plain radiographs to magnetic resonance imaging.¹⁰ Magnetic resonance imaging is often more sensitive in detecting FAI than plain radiographs.²⁷ This variability in radiographic assessment makes it difficult to adequately compare between studies.



Figure 3 Anterior center-edge angle measurement.

False-profile view of a right hip demonstrating an anterior center-edge (ACE) angle measurement. Copyright AJS.

Etiology of FAI in Athletes

The high prevalence of FAI in athletes relative to the general population begs the question of whether or not the development of FAI-related deformities are a reaction to the sports physical demands, or those with hip morphologies consistent with FAI offer a competitive advantage. The etiology is unclear and multiple theories exist.^{8,27-34} One such theory involves repetitive stress to the proximal femoral physis during skeletal maturity as a contributor to FAI, particularly with formation of the cam lesion.^{8,27,28} Zadpoor discussed additional hypotheses that would support physeal stress as a likely etiology of FAI if adequate studies were performed.⁸ One example is the hypothesis that development of the cam lesion does not continue once skeletal maturity is achieved. Agricola et al compared 89 preprofessional adolescent soccer players with 92 nonathletes between ages 12 and 19. They found evidence of a cam lesion in 56% of the soccer players vs 18% of the controls, and the earliest age these lesions were visible was 13 years. Additionally, they found no increase in the prevalence or severity of the cam lesion after the athletes reached skeletal maturity.^{28,29}

Another hypothesis is the association between training intensity and both radiographic and clinical signs of FAI.⁸ Multiple studies suggest a dose-response relationship with the development of a cam lesion and rate of sport involvement during skeletal immaturity.^{30,31} Nepple et al found that high-level male athletes were 1.9–8.0 times more likely to develop cam lesions than male controls.³² The literature that exists has varying definitions of training intensity and is underpowered. More literature with adequate power is required to define the significance of these hypotheses.

Some authors have postulated that FAI is developed from a silent slipped capital femoral epiphysis (SCFE), which is overlooked during adolescence due to lack of symptoms, but later forms the cam deformity.³³ This theory has been disproven by many authors, particularly because a SCFE hip usually reveals relative posterior displacement of the epiphysis, or the femoral head center, which is not evident in the typical cam deformity.³⁴ Additionally, due to the association between SCFE and significant obesity, the role of SCFE in the athletic population is likely not relevant.

Another theory that has been well-studied is FAI as a familial trait.³³⁻³⁶ Some authors have noted similar anatomic developments between family members, thus inferring a genetic predisposition.^{33,35} Moreover, a cross-sectional study identified patterns of varying prevalence and morphology of FAI in a cohort of 445 professional soccer players of different ethnicities, suggesting an ethnic influence.³⁶ These findings have led some authors to believe that this may be an important link to the genetic development of osteoarthritis.³⁵

Return to Sport Following Surgery and Longevity of Return

The reported rates of return to sport after surgery for FAI are favorable but the rates vary. One systematic review found

that 87% of athletes across all levels were able to return to their sport after undergoing surgery.³ Another systematic review with meta-analysis revealed 74% rate of return to sport for athletes of all levels.⁷ Schallmo et al found 84% rate of return to play in professional athletes.³⁷

There is an average of 10%-25% of athletes who do not return to their sport.^{3,7,37} Additionally, if an athlete does return to their sport, this does not necessarily mean they are back to their previous performance level, and unfortunately this is not always reported. The time of follow-up is important to determine in these studies as most athletes return to sport initially, but many of them may end their athletic career early. Philippon et al found in their study of 45 professional athletes that, although 93% returned to their sport after surgery, only 78% remained in their sport 18 months later.³⁸ Byrd et al reported on a case series with a 10-year follow-up and found an initial 87% return to play; however, by a mean of 6 years after hip arthroscopy, there was a 33% failure rate and 15 of 50 athletes progressed to arthritis and underwent a total hip arthroplasty.³⁹ Additional longitudinal studies are needed to determine the rate of return to sport and how it changes at different time points. The majority of the literature on return to sport for athletes with surgical management of FAI is retrospective case series, and prospective studies would help delineate factors contributing to successful return.⁴⁰

Factors Affecting Return to Sport

Level of Competition

The literature has consistently portrayed a positive correlation between rate of return to sport and higher level of competition (Tables 2 and 3).^{3,37,41,42} Elite athletes tend to have the highest rate of return to sport (82%-95%), while intercollegiate and recreational athletes have lower rates (59%-83%).⁴¹⁻⁴³ The literature also demonstrates a quicker return to sport for professional athletes (average 4.2 months) over recreational athletes (average 6.8 months).⁴¹

There are likely many factors contributing to the differences between varying levels of competition, most of which are speculations and not reported in the literature. One such factor may be related to the preoperative level of conditioning and overall lower joint reactive forces per unit body of mass. A second factor may be that high-level athletes are more likely to be

Table 2 Risk Factors of Failure of Return to Sport

Risk Factors
Lower level of competition ^{3,37,41,42}
Revision hip surgery ³⁷
Diffuse arthritis ^{3,38,40,42,45}
Longer duration of preoperative symptoms ^{59,60}
Advanced age ^{49,69}
Symptoms of depression ^{71,72}

Summary of risk factors for failure of return to sport after surgery for femoroacetabular impingement as displayed in the current literature, with references.

Table 3 Rates of Return to Play by Level of Competition

Level of Competition	Rate of Return to Sport (%)	References
Elite/Professional	88-95	41,43
Intercollegiate	59-85	41,42
High School	90	42
Recreational	73	42,43

In Table 3 summary of rates of return to play after surgery for femoroacetabular impingement as portrayed in the literature by level of competition, with references.

a younger age (mean 20 years) than their recreational counterparts (mean 33 years).¹³ A third factor may be due to the underlying motivation to want to return to the sport. Elite athletes may have a monetary or ego-driven desire, whereas recreational athletes may not and, therefore, are content with reducing their activity.⁴⁴ Additional intangible factors include differences in individual playing styles, coaching changes, the realities of player contracts, structural differences in various sports leagues (eg, "minor" leagues present in some sports but not others), variability in playing opportunities based on number of players on a team, and a player's ability to compensate or adopt different playing styles.³⁷

Type of Sport

Overall, the literature does not display a correlation between type of sport and the outcome of return to play following surgery for FAI (Table 4). Previous studies have reported that players in contact sports (eg, football and ice hockey) did not have an increased risk of not returning to their sport after hip arthroscopy.^{4,45} Overhead athletes (eg, baseball and lacrosse) also have a high rate of return to sport.²² Moreover, patients with hip joint hypermobility and elevated Beighton scores (eg, dancers and gymnasts) have good short to mid-term outcomes following surgery.⁴⁶

Type of Surgery

Arthroscopic and open approaches that address FAI have similar patient reported outcomes;⁴⁷ however, return to sport is not adequately addressed between open and

Table 4 Rates of Return to Play by Sport

Sport	Rate of Return to Sport (%)	References
Football	79-87	37
Baseball	81-100	22,37,49,76
Ice Hockey	92-96	37,43
Basketball	86	37
Running	94	59
Lacrosse	100	22
Swimming	100	21
Cycling	97	20
Rowing	56	19

Summary of rates of return to sport after surgery for femoroacetabular impingement as portrayed in the literature by sport, with references.

arthroscopic techniques. Some studies show hip arthroscopy to have better functional outcomes, but less of a correction of the alpha angle than with open procedures.⁴⁸ One systematic review found similar rates of return to sport (86% after hip arthroscopy and 87% after open hip surgery), as well as similar rates of return to previous level of competition (84% after hip arthroscopy and 81% after open hip surgery).³ A systematic review with meta-analysis revealed similar short and mid-term outcomes between arthroscopic and open hip surgery, but hip arthroscopy had superior results regarding general health-related quality of life scores.⁴⁷ Further evidence is needed to compare outcomes between open and arthroscopic approaches for FAI.

The type of labral treatment may play a role in an athlete's postoperative outcome. In the general population, labral repair is associated with a lower risk of reoperation.⁴⁹ Another review on both athletes and nonathletes found improved functional outcomes with labral repair over labral debridement.⁴⁰ A prospective randomized study by Krych et al found a clinically significant improvement in Hip Outcome Scores (HOS) for activities of daily living and sports in female patients undergoing labral repair as compared to labral debridement.⁵⁰ A study of 21 elite athletes who underwent labral reconstruction with an iliotibial band autograft revealed an 84% rate of return to play with 81% returning to their previous athletic level; however, 2 patients progressed to total hip arthroplasty and 2 required revision for lysis of adhesions.⁵¹

The microfracture technique is utilized in situations with significant focal cartilage lesions of the acetabulum. In the general population, acetabular microfracture is associated with a higher rate of conversion to a total hip arthroplasty.⁵² In the athletic population, there is no significant difference in rate of return for players who undergo microfracture compared to those who do not.^{4,37,45,53} Additionally, microfracture does not delay the return to sport.³⁷ However, many studies do not comment on the level of competition to which the athletes returned. Longer follow-up is needed to assess the risk of surgical failure in athletes who underwent a microfracture.

Capsular management at the time of hip arthroscopy has been variable and controversial in the past,⁵⁴ however, there is a growing body of literature that supports routine capsular closure if a capsulotomy is performed. Some literature suggests that plication or closure of interportal capsulotomies results in improved hip stability and functional outcomes, particularly with revision cases or athletes with borderline dysplasia.⁵⁴ Frank et al compared partial vs complete closure of T-capsulotomies and found improved sport-specific outcomes and lower revision rates with complete repair.⁵⁵ Levy et al found a high rate of return to sport (94%) in runners with FAI who underwent hip arthroscopy and capsular plication.⁵⁶

The most common reason for patients to undergo revision hip arthroscopy is for residual FAI, followed by labral re-tear and chondromalacia.⁵⁷ Females are more likely to undergo revision surgery than males.^{57,58} The literature reveals a

lower rate of return to play in professional athletes undergoing revision hip surgery (58.8%) compared to primary surgery (86.7%).³⁷

Severity of Injury

It is well known that the presence of arthritic changes in the hip at the time of surgery for FAI is linked to worse outcomes in the general population.^{49,52,59} Unfortunately, the literature reflects similar outcomes for the athletic population.^{3,38,40,42,45} Casartelli et al found a negative correlation between return to sport and the presence of diffuse arthritis (Outerbridge grade IV) at the time of surgery.³ In his case series, Philippon found that 3 out of 45 professional athletes did not return to their sport following surgery for FAI secondary to significant arthritis (diffuse Outerbridge grade IV).³⁸ A higher preoperative Tonnis grade (≥ 2) is also associated with worse postoperative outcomes and failure of return to sport.⁵⁹

Athletes with a longer duration of preoperative symptoms are more likely to have an extended postoperative recovery with delay of return to sport.^{56,60} Additionally, greater chronicity of hip symptoms prior to hip arthroscopy is associated with shorter postoperative career lengths for professional athletes.⁶¹

Regarding symptomatic FAI in both hips vs one hip, Schallmo et al found no significant difference in return to play rates for professional athletes with bilateral vs unilateral involvement.³⁷ A cohort study found less improvement in pain scores in patients who underwent bilateral hip arthroscopy as compared to unilateral involvement. Additionally, patients with bilateral involvement who waited longer than 10 months between surgeries had lower outcome scores than patients who underwent both surgeries in under 10 months.⁶²

Postoperative Rehabilitation

Postoperative rehabilitation programs in the literature are nonspecifically reported and are largely descriptive. This heterogeneity makes it difficult to draw conclusions on which rehabilitation protocols are most effective.⁶³ One review suggests that a multiphase protocol with early weight bearing and mobility limitations may contribute to improved function, patient satisfaction and return to preinjury level of performance.⁶⁴ However, more comparative studies with clear rehabilitation protocols are needed.

Patient Reported Outcome Measures (PROMs)

The literature portrays improved clinical short-term and midterm outcomes after surgery for FAI.⁴⁰ However, there is high variability in the use of PROMs among the FAI literature.^{40,65} Although the most commonly used scoring systems used for FAI are the modified Harris Hip Score (mHHS) and the HOS, their clinical relevance can be difficult to

interpret.^{66,67} Studies have shown that statistical improvements in PROMs do not always correlate with rate of return to sport, as some athletes will return to their sport despite not feeling completely well after surgery.^{3,68} Chahal et al attempted to rectify this inconsistency by determining the patient acceptable symptomatic state (PASS) for mHHS and HOS, which is an absolute value measurement of clinical improvement based on the concept of feeling good or not good.⁶⁶ In their study, they found that patients who had higher baseline scores for the mHHS and HOS preoperatively (greater than the 50th percentile) were more likely to have postoperative scores above the PASS threshold. In other terms, higher preoperative PROMs are more likely to result in better patient well-being postoperatively, regardless of whether or not the athlete returns to their sport.

Patient Factors

A variety of patient-specific factors affecting an athlete's rate of return to sport have been highlighted in the literature. In the general population, older age (≥ 50 years) is consistently associated with increased risk of surgical failure after a hip arthroscopy for FAI.^{49,69} On the contrary, one study found that older aged recreational athletes had similar rates of return to sport than younger, higher-level athletes.⁶⁰

Increased body mass index (BMI) has potential to limit return to sport or cause an extended postoperative recovery period in one study.^{56,60} A study on recreational runners found that a lower BMI was correlated with improved PROMs.⁵⁶ However, another study found no correlation between clinical outcomes and varying BMI.⁷⁰

The literature reveals an association with the presence of depression in patients with FAI.⁷¹ The prevalence of depression was found to be higher in patients with FAI than in the general population. Furthermore, patients with moderate to severe levels of depression were more likely to do worse and fail to reach a PASS when compared to patients with minimal symptoms of depression.⁷¹ The use of mental health medication was found to be a poor predictor of failure in active-duty military undergoing hip arthroscopy for FAI.⁷²

Predictors Affecting Return to Previous Level of Competition

An important but often overlooked factor is the difference between the rate of return to sport and the rate of return to the previous level of competition. While the literature contains results of return to sport after hip surgery, there often is no comment on the patient's athletic performance before and after surgery. A systematic review with meta-analysis by Reiman found that on 37% of studies clearly differentiated those 2 factors.⁷ The definition of return to play is variable across the literature. The rates of return to sport portrayed in the literature may be falsely elevated when not taking the level of competition into consideration. One cross-sectional cohort established a stringent definition of return to play,

incorporating preinjury level of performance, and found only 57% of 108 athletes had met the criteria.⁷³ More standardization in the definition of return to sport that takes into account preinjury level of performance is required.

Many predictors affecting return to previous level of competition reflect the risk factors correlated with surgical failure. However, some predictors are sport-specific and are dictated by both the physical demands of the sport and the court or field position of the athlete.

American Football

Rates of return from hip arthroscopy for American professional football players have been reported between 79% and 87%, similar to rates seen in other sports such as baseball, basketball, and ice hockey. However, 2 separate studies have shown the return rate for football offensive linemen to be 61%; significantly less than rates for other football players and other sports.^{4,37} This finding may be a consequence of the larger body habitus and repetitive push-off from the line in hip flexion seen in offensive linemen.

Ice Hockey

Professional ice hockey players return from hip arthroscopy at rates of 92%-96%.^{37,74} Shorter duration of preoperative symptoms and younger age have been correlated with a longer career length postoperatively in a case series of 60 professional ice hockey players.⁶¹ Goalies may be predisposed to a higher risk of symptomatic hip dysfunction secondary to the demanding postures they assume; for example, the common butterfly-style save that requires a significant amount of hip flexion and internal rotation. However, a recent study found that 86% of professional goalies returned after hip arthroscopy, which is similar to players in other sports.³⁷ This finding suggests that goalies may have an equal chance of returning after hip arthroscopy despite a potentially higher risk for injury.

Soccer

As stated previously, soccer players have a much higher prevalence of subspine impingement secondary to repetitive high flexion when compared to their nonkicking counterparts.¹⁵ It is important to address subspine involvement in this population when present during surgery, or else there is an increased risk of surgical failure and delayed return to sport. Notably, soccer players (and likely other cutting and pivoting athletes) have an increased risk of noncontact anterior cruciate ligament rupture with decreased hip rotation that is present with FAI.⁷⁵

Baseball

Previous studies of elite baseball players found that these players may return from hip arthroscopy at rates of 81%-90%.^{37,76} Pitchers are more likely to require hip arthroscopy over position players.⁷⁷ For pitchers and hitters, the leading

hip is part of a complex kinematic linkage and generates substantial power during wind-up or batting.⁷⁶ For this reason, it has been speculated that the leading hip may be predisposed to a higher risk of injury and that return may be less likely if operative management is required. Notwithstanding, current evidence suggests that professional baseball pitchers or hitters who undergo hip arthroscopy on their lead leg have a similar chance of returning (83% and 71%, respectively) as non-lead leg players and players in other sports.³⁷ Notably, however, pitchers who undergo hip arthroscopy have a 7-fold higher likelihood of requiring ulnar collateral ligament reconstruction, which may be secondary to greater upper body compensation to maintain pitch velocity after hip arthroscopy.^{37,76} A case series of 44 professional baseball players found that, regardless of sporting position, 95% of players were able to return to play at preinjury level, with an average career length of 9.5 years.⁷⁷

Basketball

There is a paucity of evidence-based literature regarding hip arthroscopy in basketball. There is one published study that evaluated return to play in professional basketball players and reported a return rate of 86%.³⁷

Conclusion

There are many risk factors portrayed in the literature that can contribute to an athlete's return to sport following surgery for FAI (Table 2). Likewise, the literature suggests many sport-specific and nonspecific predictors that can affect an athlete's return to previous level of competition. More randomized controlled trials or high-quality cohort studies are needed to better assess the rate of return to sport and its prognostic indicators. Many of the current studies are case series or other lower level of evidence with varying methodological quality. Follow-up time points are important to take into consideration, as they can drastically affect a study's rate of return to play. Furthermore, standardization is required with regard to radiographic and clinical assessment of FAI. Finally, clear definitions need to be made between return to sport and the return to previous level of competition. Identifying an athlete's level of competition before and after surgery as well as their PASS value might be more meaningful than the rate of return to play alone.

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