

# Factors That Influence the Return to Sport After Arthroscopic Bankart Repair for Glenohumeral Instability

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**Abstract:** Numerous studies have reported high rates of return to sports following arthroscopic Bankart repair (ABR). However, there is enormous controversy regarding the optimal management of these patients in the postoperative period. Controversy issues include rehabilitation, criteria for returning to sports, and the specific management of each athlete according to the sport they practice. Even though there are several rehabilitation protocols published in the literature, wide variability exists concerning the key elements of rehabilitation after an ABR. Regarding criteria for return to sports, there is a wide variation across the different published studies. The type of sports has been shown to affect an athlete's decision to return to sports. Nevertheless, most research is evaluated by classifications that cluster different sports into categories that may have other influences in return to sports when analyzed separately. Finally, in addition to physical readiness, the athlete's psychological state is crucial for returning to sports. However, the contribution of psychological readiness to an athlete's return to sports after shoulder instability surgery remains uncertain and unexplored.

**Keywords:** return to sports, Bankart, anterior shoulder instability, arthroscopy

## Introduction

Numerous studies have reported high rates of return to sports following arthroscopic Bankart repair (ABR).<sup>1-3</sup> In a recent systematic review by Memon et al<sup>1</sup> 34 studies were analyzed reporting a return to sports rate after an ABR of 81%. Likewise, Abdul-Rassoul et al<sup>2</sup> reviewed 16 articles evaluating a return to sports rates among the different surgical treatments options for anterior shoulder<sup>3</sup> instability, reporting a 97.5% return to sports rate in a mean of 5.9 months after an ABR. These results are comparable with adolescent athletes, with an 89.2% return to sports rate at a mean of 5.3 months following an ABR.<sup>3</sup> Along with how likely it is to return to sports after an ABR, one of the most common questions athletes have is whether they will return to their sport at the same level of performance after surgery. Some authors reported that ABR had the highest rate of return to pre-injury levels of competition, with a 91.5%, compared to other anterior shoulder stabilization techniques.<sup>2</sup> In another recent systematic review by Ialenti et al<sup>4</sup> in which 545 patients who underwent an ABR were analyzed, 71% returned to sports at the same level of play. However, their findings were a little lower than those found in patients operated by a Latarjet procedure (73%). These results are consistent with Memon et al<sup>1</sup> findings, in which 66% of patients return to pre-injury levels. Finally, in the same way, Kasik et al<sup>3</sup> reviewed 11 studies entailing 461 adolescent athletes reporting a rate of return to pre-injury sports level of 79.8% after an ABR. However, there is enormous controversy regarding the optimal management of these patients in the postoperative period. Controversy issues include rehabilitation, criteria for returning to sports, and the specific management of each athlete according to the sport they practice.

The purpose of this study was to perform a critical review of the literature on the available scientific evidence regarding different controversial aspects that influence return to sports of patients operated on for glenohumeral instability including A) rehabilitation protocols B) criteria for return to sports C) Influence of the type of sports and the pre-injury sport level of competition and D) reasons why athletes do not return to sports.

## Rehabilitation

A successful arthroscopic Bankart repair (ABR) should enable patients to return to sports and achieve their pre-injury levels of competition after surgery. However, this return to sports is contingent upon the completion of a rigorous postoperative physical therapy program.<sup>5–7</sup> Postoperative rehabilitation therapy is essential for restoring shoulder mobility, strength and protecting the surgical repair.<sup>5,6,8</sup> As such, rehabilitation following an ABR has been a topic of investigation in recent years.<sup>5,6,9</sup> Currently, there is a consensus guideline attempt by the American Society of Shoulder and Elbow Therapists (ASSET) and several rehabilitation protocols available in the literature. Moreover, a recently published international consensus via a modified Delphi process also remarked the importance of following a rehabilitation process. However, there is still a lack of a validated standard of care protocol.<sup>5,6,8–10</sup> Therefore, wide variability exists across the professional literature concerning the key elements of rehabilitation after an ABR.<sup>5,6,9</sup>

In 2010, the ASSET offered a 3-phase-consensus-rehabilitation guideline for anterior arthroscopic capsulolabral repair of the shoulder.<sup>10</sup> Phase 1 (postoperative 0–6 weeks) focuses on protecting the surgical repair while not exceeding ROM. Phase 2 (postoperative 6–12 weeks) is based on a gradual increase in ROM with a goal of full ROM at 12 weeks. Finally, Phase 3 (postoperative 12–24 weeks) focuses on resistance training and sport-specific activity, with a goal of return to activity on completion of this phase.<sup>10</sup> However, it only provides recommendations rather than an evidence-based protocol.<sup>9</sup> Additionally, it is unclear if this guideline results in better outcomes than standard care, as only one non-randomized controlled study reported no differences in shoulder-related physical function and quality of life between the two postoperative therapies.<sup>11</sup> Just as importantly, substantive discrepancies were noted between the ASSET consensus recommendations and available protocols for rehabilitation after an ABR.<sup>5</sup>

Despite having specialist-based guidelines, numerous rehabilitation protocols are described in the literature.<sup>5</sup> DeFroda et al,<sup>5</sup> in a descriptive epidemiology study, reviewed 30 ABR protocols Accreditation Council for Graduate Medical Education (ACGME)-accredited orthopedic surgery programs reporting high variability among protocols. Similarly, in a recent systematic scoping review by McIsaac et al<sup>6</sup> evidence gaps concerning postoperative rehabilitation protocols were analyzed. The authors reported eleven rehabilitation protocols finding significant great heterogeneity in the rehabilitation parameters and evaluation approaches.<sup>6</sup> There exist considerable variation among the existing protocols concerning immobilization, timing of ROM milestones, and return to sports or activities.<sup>5,6</sup> These findings further suggest that a standardized protocol does not exist. There is insufficient data regarding which form of immobilization is superior and which position the shoulder should be immobilized in.<sup>6,9</sup> Moreover, regarding the length of immobilization, while some rehabilitation protocols recommend an early period of absolute immobilization, some studies have evaluated an accelerated rehabilitation protocol reporting excellent results.<sup>12–14</sup> For instance, in a prospective randomized clinical study, the group who received an accelerated range of motion protocol returned faster to functional ROM and activities.<sup>12</sup> Finally, interestingly, as a reflection of no standardized definition for return to sports, substantial variability exists within protocol recommendations.<sup>6,9</sup> Defroda et al<sup>5</sup> described that 90% of rehabilitation protocols made specific recommendations regarding return to non-overhead sport-specific activities and 66.7% on return to throwing, reporting a mean of return to sports of 32.4 ± 9.3 weeks. Similarly, McIsaac et al<sup>6</sup> reported that only seven of eleven protocols included a return to sports guidance ranging from six weeks to six months.

## Criteria for Return to Sports

There are some general criteria that should be considered to determine when an athlete is ready to return to sports. A 2022 international consensus found strong agreement in the restoration of strength, restoration of range of motion, free apprehension, pain-free, sport-specific skills, and restoration of proprioception.<sup>8</sup> However, in a recent systematic review, Ciccotti et al evaluated the criteria for return to sport (RTS) after surgical stabilization of anterior shoulder instability.<sup>15</sup> The authors included 58 studies describing at least 1 criterion used by researchers to allow return to sports.<sup>15</sup> The authors identified 13 different combinations of criteria for returning to sports, which highlights the lack of consensus that exists among experts regarding this topic. Furthermore, there was also significant variability among authors who used the same criteria. For example, “time” was the most widely used criterion to allow athletes to return to competition. However, the specific time in which the different authors allowed their patients to competing again varied from 1.5 months to 12 months.

On the other hand, it is important to keep in mind that although most authors use time as the only criterion to define return to sport, it is important to evaluate other relevant variables that are often not taken into account. Ciccotti et al reported that 85% of these studies (44 of 58) used time as the sole explicit criterion for RTS and in 52% of the cases 6 months was the time in which patients were allowed to return to sports.<sup>15</sup>

In a recent survey, involving 317 surgeons from Europe and the United States, where the criteria used for returning to sports were evaluated, the authors reported that both for Bankart and Latarjet surgery, the most common time point to allow athletes to return to competition was 4 months. However, the majority reported waiting an additional period of time, most commonly 2 months, before allowing collision athletes to return to play.<sup>16</sup>

Interestingly, the Multicenter Orthopaedic Outcomes Network (MOON) shoulder group published a prospective study evaluating whether patients who underwent a Latarjet procedure were ready to return to sports 6 months after the procedure.<sup>17</sup> RTS criteria were defined as a return to baseline strength and  $<20^\circ$  side-to-side ROM deficits in all planes. The authors found that at a 6-month follow-up, 55% of the athletes failed to meet one or more criteria for RTS, suggesting that time alone is not enough to determine whether athletes are ready to return to compete.<sup>17</sup>

Unfortunately, there is no precise information in the literature on how long it takes patients to regain mobility after the different shoulder stabilization procedures. In general, preoperative mobility is compared with postoperative mobility at a fixed point of the postoperative follow-up.<sup>15</sup> Moreover, it is not well defined what “recovery of mobility” means. A recent review shows that there are at least 8 different definitions of mobility recovery in the literature.<sup>15</sup> We consider that it is important to evaluate mobility with a goniometer. We always measure anterior flexion, internal rotation, abduction, and external rotation. Although the final objective is to regain full mobility, when the patient has a difference  $< 20\%$  with respect to the contralateral side, we allow the patients to return to sports.

Regarding strength, although this is a difficult parameter to measure objectively in the office, we believe it should be recorded and taken into account when evaluating the possibility of returning to sport.<sup>8</sup> In the case of competitive athletes who usually go to the gym as a regular part of their physical training, we take into account the loads they lifted before the injury and we use that information as a guide during the evolution of their recovery. In competitive sports where there is a significant demand for strength and power to the shoulder, such as collision and forced overhead sports, we let patients to compete again when they are able to lift  $> 80\%$  of the weight they lifted before the injury. These special considerations are supported by recent modified Delphi consensus in which there was a strong agreement in giving particular attention to collision (93%), overhead (97%), and elite (98%) athletes in their return to sports.<sup>8</sup> Other tools that have proven useful to assess strength recovery after surgery are isometric devices, which are capable of measuring strength in a more precise and objective manner. However, the results in the literature are controversial. On the one hand, some authors reported that after the Latarjet procedure, supination and external rotation strength at  $60^\circ$  decreased compared to the contralateral side.<sup>18,19</sup> On the other hand, other authors reported that although strength may be diminished the first 3 months after surgery, after 6 months these differences were not statistically significant.<sup>20,21</sup> Finally, it is important to note that most studies did not evaluate the consequences of the differences found in strength between the operated and non-operated shoulders. Therefore, we do not know whether the differences found in some studies have a relevant clinical consequence. Hence, more studies are needed to evaluate what percentages of strength loss are significant for the athlete for each type of sport.

Last but not least, it is also important to consider the psychological aspects that could influence the athlete and compromise their return to sport. In the last phase of rehabilitation, and before returning to competition, athletes think about the lessons they have learned from the injury and express concerns about their ability to return to play, anxiety, and fear of a new injury.<sup>8,21</sup>

## **Influence of the Type of Sports and the Pre-Injury Sport Level of Competition in the Rate of Return to Sports**

After an ABR, return to sports rates varies considerably among available studies, ranging from 20% to 100%.<sup>1,22</sup> A number of factors have been reported to be associated with a lower return to sports rates and longer times to return to play after an ABR, including the type of sports and pre-injury sport level of competition.<sup>1</sup>

Several previous studies have reported that contact/collision and overhead sports are associated with inferior return to sports rates than non-contact sports.<sup>22–25</sup> Petrera et al<sup>26</sup> reported a 73% rate of return to sports in their collision athletes. Cho et al<sup>27</sup> reported only a 65% rate of pre-injury levels in collision athletes. However, these results were globally reported making it difficult to differentiate return to sports rates among each sport. In a comparative study by Rossi et al,<sup>23</sup> the authors reported high variability in return to sports among the different contact sports after an ABR, ranging between 70% and 95%. Those sports in which the shoulder was highly exposed to repetitive trauma, such as martial arts and boxing, reported an inferior return to sports rates and longer time to return to play. Although not routinely assessed, the playing position on the field has also been shown to affect an athlete's return to sports. Pasqualini et al<sup>28</sup> reported that rugby players' sports level achieved after surgery varied significantly according to their playing position.

Pre-injury levels of competition and their influence on return to sports vary within the literature.<sup>1,24,29</sup> This could be because there is no regularly used definition for a recreational or competitive athlete among published studies.<sup>22,30</sup> Memon et al<sup>1</sup> reported that 82% of their competitive athletes returned to sports, with 88% returning at pre-injury levels. National Football League (NFL) and National Basketball Association (NBA) athletes reported high rates of return to sports after sustaining shoulder instability events regardless of treatment type.<sup>31,32</sup> On the contrary, other studies have suggested that patients without regular sporting activity reported a more favorable return to sports rates than collegiate or professional athletes.<sup>24,29</sup> Additionally, Cohen et al<sup>33</sup> analyzed professional baseball players reporting that only 23% returned to the same or higher sport level after the shoulder or elbow surgery.

## Why Patients Don't Return?

In addition to physical readiness, the athlete's psychological state is crucial for returning to sports.<sup>34–36</sup> Psychological factors affecting return to play have been thoroughly analyzed in the orthopedics field, specifically after an ACL reconstruction surgery.<sup>37–41</sup> However, the contribution of psychological readiness to an athlete's return to sports after shoulder instability surgery remains uncertain and unexplored.<sup>36</sup>

Rossi et al<sup>34</sup> evaluated why athletes did not return to sports after an ABR, reporting that 74% did not return to sports despite excellent postoperative outcomes due to reasons independent of shoulder function. The authors reported that the most frequent reasons were fear of reinjury, lack of confidence in their shoulders, and a concern about a new rehabilitation process.<sup>34</sup> Likewise, Tsong et al<sup>42</sup> analyzed 25 patients reporting that fear of reinjury, shifts in priority, mood, social support, and self-motivation considerably affected athlete's return to sports decision after an ABR. Finally, Plath et al<sup>24</sup> reported that most of their athletes did not return to sports after ABR because of non-shoulder-related reasons and because they were concerned about sustaining a further injury to the shoulder.

Although not routinely used, a scoring system is available to address the psychological readiness after shoulder instability.<sup>35</sup> Based on the Anterior Cruciate Ligament-Return to Sport after Injury (ACL-RSI) scale, Gerometta et al<sup>35</sup> proposed and validated the Shoulder Instability-Return to Sports after Injury (SIRSI) scale.<sup>43</sup> The authors analyzed 62 rugby players reporting that the mean of the SIRSI score was significantly higher in those who returned to sports after traumatic shoulder instability.<sup>35</sup> Similarly, Hurley et al<sup>36</sup> compared patients who returned to sports with those who did not return after an ABR. The authors concluded that those who did not return to sports exhibited poor psychological readiness to return to play.<sup>36</sup> Finally, in a multilinear analysis, the SIRSI questions about fear of reinjury were associated with a lower return to sports.<sup>36</sup>

## Future Perspectives/Conclusions

The disparities among available protocols can confuse patients, therapists, and surgeons regarding postoperative rehabilitation, resulting in longer recovery times and inferior postoperative outcomes. Thus, we think there is a need for high-quality rehabilitation-based investigations to establish a validated rehabilitation protocol and, ultimately, standardize physical therapy programs to improve patient care after an ABR.

There is enormous variability in the literature regarding the criteria considered by the different authors to allow patients to return to sport. Even the same criterion is used in multiple different ways.

After an ABR, return to sports rates are high; however, it is complex and different factors influence it.<sup>1</sup> The type of sports has been shown to affect an athlete's decision to return to sports.<sup>22</sup> Nevertheless, most research is evaluated by

classifications that cluster different sports into categories that may have other influences in return to sports when analyzed separately. Therefore, by knowing the exact return to sports rate of each sport, physicians could accurately inform the athletes about what outcomes they should expect after surgery.

An athlete's psychological readiness has been considered a major factor affecting the decision to return to sports.<sup>36</sup> Moreover, as the ACL-RSI scale is used after an ACL reconstruction, the SIRSI score was validated to evaluate psychological readiness after shoulder instability.<sup>35</sup> However, there is scarce literature assessing psychological readiness and return to sports after an ABR.<sup>36</sup> We think psychological readiness should be routinely evaluated in further studies using appropriated and validated scales, such as the SIRSI scale, as well as it should be considered to decide when an athlete is ready for return to sports.

## Disclosure

The authors report no conflicts of interest in this work.

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