Systematic Review

Return to Play Criteria Following Surgical Stabilization for Traumatic Anterior Shoulder Instability: A Systematic Review

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Purpose: To identify and describe in the existing literature any criteria used for return to play following surgical stabilization for traumatic, anterior shoulder instability. **Methods:** We performed a systematic review evaluating surgical stabilization for primary traumatic anterior shoulder instability in skeletally mature patients with a minimum of 1-year follow-up using Level I to IV studies in PubMed and EMBASE from January 1994 to January 2017. **Results:** Fifty-eight studies with at least 1 explicitly stated criterion for return to play were identified from a review of more than 5,100 published articles. Seven different categories of return to play criteria were identified, the most common of which were time from surgery (89.6%), strength (18.9%), and range of motion (13.8%). Pain, stability, proprioception, and postoperative radiographic evaluation were also used. As hypothesized, in 75.8% of the included studies (44/58), time was the only criterion explicitly used. The most commonly used time for return to play was 6 months. **Conclusions:** This systematic review identifies 7 criteria that have been used in the available literature to determine when patients are ready to return to play; however, consistent with our hypothesis, 75% of studies used time from surgery as the sole listed criterion, with the most commonly used time point of 6 months postoperative. All of these criteria can be used in future research to develop a comprehensive checklist of functional criteria in hopes of reducing recurrent injury. **Level of Evidence:** Level IV, systematic review.

Instability of the glenohumeral joint is common among young, active patients. Data from the National Collegiate Athletic Association Injury Surveillance System suggests these injuries occur at a rate of 0.12 per 1,000 exposures within that population.[1] Greater than 10 days are lost to sport in nearly half of instability events.[1] Furthermore, with nonoperative management, approximately 95% of patients younger than 20 years have been shown to suffer from recurrent instability events.[2-4] As a result, many surgeons advocate surgical stabilization to reduce recurrence and allow the greatest opportunity for return to play.

Shoulder stabilization surgery necessitates a minimum period of postoperative rehabilitation for biologic healing to occur, and this is often followed by reconditioning to restore range of motion, strength, and coordination prior to safe return to play. However, it remains unclear when patients are safe to return to play without restriction. Many factors can theoretically predispose to recurrent injury. These include young age, male gender, inappropriate surgical indications, technical errors at the time of surgery, untreated concomitant pathology, biologic factors such as incomplete healing, participation in high risk activities such as collision sports, and incomplete rehabilitation with premature return to play.[1-7] In particular, significant bone defects on the glenoid or humeral side can

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predispose toward failure of arthroscopic stabilization and should be addressed with the appropriate surgical procedure.[7]

The purpose of this systematic review was to identify and describe in the existing literature any criteria used for return to play following surgical stabilization for traumatic, anterior shoulder instability. Although authors use an abundance of terms to signify return to play (return to play, return to sport, return to unrestricted activity, full/unlimited activity, etc.), we hypothesized that most surgeons use time-based criteria alone without using additional functional or performance-based criteria.

Methods

We performed a systematic review of Level I to IV studies of patients undergoing surgical stabilization for primary traumatic anterior shoulder instability. We searched PubMed and EMBASE for the terms *anterior instability*, *shoulder stabilization*, *shoulder instability rehabilitation*, *shoulder stabilization results*, *Bankart repairs*, *labral tears*, *recurrent instability*, *surgical management of shoulder instability*, and *return to play* from January 1994 to January 2017 (Table 1). January 1994 was selected as 20 years before the conception of the project and the search was subsequently updated to ensure no recent studies were missed. Twenty years was selected because it would include all studies using modern stabilization techniques and capture the largest number of potential return to play criteria. We used the definition of *return to play* as any statement of return to full, unrestricted activity including sports, work, etc. For the purpose of the current review, "return to play" signified the point at which patients were allowed to participate in any activity, including sports, without further restriction postoperatively. An abundance of terms has been used in the literature (return to play, return to sport, return to unrestricted activity, full/unlimited activity, etc.), and these were treated as equivalent if the authors did not suggest further surgeon-imposed restrictions on their patients.

Table 1. Search Strategy With MeSH Terminology and Combinations

Literature Search Strategy: January 1, 2014, to January 1, 2017, in PubMed and EMBASE
"anterior instability"
AND/OR
"shoulder stabilization"
AND/OR
"shoulder instability rehabilitation"
AND/OR
"shoulder stabilization results"
AND/OR
"Bankart repairs"
AND/OR
"labral tears"
AND/OR
"recurrent instability"
AND/OR
"surgical management of shoulder instability"
AND/OR
"return to play"

Studies were required to be (1) written in the English language and (2) conducted in a population of adult, skeletally mature patients with a mean age of 18 years or greater, (3) with traumatic anterior instability, (4) undergoing a primary stabilization procedure, and (5) with a minimum of 1-year follow-up. Studies lacking explicit return to play criteria, review articles, biomechanical studies, technical notes, studies with follow-up less than 1 year, studies looking exclusively at posterior or multidirectional instability, studies including patients with hyperlaxity or atraumatic instability, studies including multiple patterns of instability, revision procedures, or studies using thermal capsulorraphy were excluded. We explicitly included open stabilizations, including bony procedures, to capture as many return to play criteria as possible. The procedures used in each included study are presented in Table 2. Although many studies included some patients younger than 18 years, any study in which the mean patient age at the time of surgery was less than 18 years was excluded as a primarily pediatric study. As many as 39 additional studies appeared to meet criteria for inclusion but were excluded for having no explicit return to play criteria.

The reference sections of all selected studies were reviewed by hand, and all potentially relevant articles were compiled. The initial search was completed with a team including a dedicated research fellow (U.S.) and a medical student (R.H.), under the direct supervision of a resident physician (M.C.C.). Any questions regarding inclusion were directed to the senior author (K.B.F.). The methods section of each article meeting the inclusion criteria was analyzed by the senior author. Only those studies that were confirmed to meet all criteria were selected, and the data were compiled from each. Because of the heterogeneity in reporting of results, a meta-analysis was not attempted. Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) criteria were followed throughout the study.[65] The primary data of interest were the criteria explicitly used in each study to determine when patients were permitted to return to play and any details provided about these criteria. Additional data extracted included publication data, demographic data, patient pathology, procedures performed, and return to play rates.

Results

Study Design

The initial database search yielded 5,100 unique published articles. Ultimately, 58 studies were identified