Return to Play After Open Bankart Repair

A Systematic Review

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Background: Results of open Bankart repair have been well reported. However, less information is available outlining the timetable for return to play (RTP) in athletes after this procedure.

Purpose: To review the current literature regarding (1) the timetable recommended for athletes to RTP after an open Bankart repair and (2) the objective criteria on which the decision to allow an athlete to RTP is based.

Study Design: Systematic review; Level of evidence, 4.

Methods: A comprehensive literature search was conducted of all relevant English-language articles using the electronic databases OVID and PubMed between the years 1947 and 2012 to identify open Bankart repair. Two reviewers screened articles for eligibility based on the following criteria: (1) an open Bankart repair, (2) a minimum follow-up of at least 8 months, (3) any report that described the procedure in athletes, and (4) any report that described the time for an athlete to RTP. All relevant data were collected and analyzed with regard to number of patients; mean follow-up; Rowe, Constant, and American Shoulder and Elbow (ASES) scores; redislocation rate; and return-to-sport timing.

Results: In all, 559 relevant citations were identified, of which 29 articles met the inclusion criteria. The mean follow-up was 51.7 months (range, 8-162 months), and the mean age was 25.9 years (range, 21-31 years). The average Rowe score for all studies was 86.9 (range, 63-90). The average redislocation rate was 5.3%. Twenty-six of 29 studies cited a specific timetable for unrestricted RTP, with an average of 23.2 weeks (range, 12-36 weeks). Only 38% of authors reported sport-specific criteria for return to competition, with the majority allowing return to noncontact sports at 12 to 16 weeks, and the resumption of throwing/contact sports by 24 weeks. Three reports described specific functional parameters for RTP.

Conclusion: The current review summarized return-to-play guidelines for athletic competition after open Bankart repair. These data may provide general guidelines to aid surgeons when determining the appropriate timetable to allow an athlete to return to unrestricted competition.

Keywords: Bankart; open Bankart; return to play

Anterior shoulder instability is commonly seen in conjunction with traumatic sports injuries. Bankart[1] is credited with describing anterior inferior labral detachment from the glenoid rim as the essential lesion in anterior shoulder instability. The initial results of an open repair of a Bankart lesion as performed by Bankart were reported in 1957 with a 4% failure rate.[6] Subsequently, Rowe et al[25] published their series of 145 patients with a redislocation rate of 3.5%. Although current arthroscopic techniques of anterior shoulder reconstruction have significantly evolved over the past 2 decades, historical reports of open Bankart repairs have documented significantly low recurrence rates from 0% to 11%.[‡]

Although the results of open Bankart repair have been well reported, less information is available outlining the timetable for return to play (RTP) in athletes after this procedure. There is also limited literature regarding the criteria on which surgeons base their recommendations for RTP. The purpose of the current study was to review the current literature regarding (1) the timetable recommended for athletes to RTP after an open Bankart repair and (2) the objective criteria on which the decision to allow an athlete to RTP is based.

MATERIALS AND METHODS

Eligibility Criteria

The present study reviewed the criteria and timing used by surgeons to determine when athletes could return to unlimited sports participation. In addition, sport-specific criteria for RTP were also analyzed.

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‡References 2-5, 7-20, 22, 23, 26, 29, 31-33.

We identified studies written in the English language fulfilling the following eligibility criteria: (1) the study evaluated the outcome of a primary open Bankart repair in isolation or in comparison with an arthroscopic procedure for recurrent anterior shoulder instability and (2) the study was published or unpublished (presented at a society meeting) between 1947 and 2012.

Literature Search

A comprehensive literature search was conducted of all relevant English-language articles. The electronic databases OVID and PubMed were searched from 1947 and 1990, respectively, up to and including September 20, 2012. The following terms, alone or in combination, were used in the search: (1) Bankart, (2) Bankart repair, (3) open shoulder surgery, (4) open Bankart repair, (5) open Bankart surgery, (6) open shoulder instability reconstruction, (7) open shoulder repair, and (8) anterior shoulder repair. All abstracts and presentations from national or international meetings listed in the databases were included. Many studies composing the current review involved a comparison of arthroscopic and open Bankart repair procedures. These studies were included in the data collection. However, the open repair group was separated and these data used exclusively. Studies that included different fixation devices were included in the analysis as long as all procedures performed were open Bankart repairs.

Study Selection

Two reviewers screened the titles and abstracts of all studies identified in our initial search. Any title that included the terms *Bankart*, *open surgery*, or any reference to a non-coracoid or bone block open shoulder reconstruction was reviewed. The reviewers screened the eligibility of the reviewed full-text articles for final inclusion based on the following criteria: (1) any report describing an open Bankart repair for acute or chronic anterior shoulder instability on the dominant or non-dominant side, (2) a minimum of at least 8 months of follow-up, (3) any report that described the procedure in athletes, and (4) any report that described the time to return to sports participation after surgery.

All reports were excluded if they included any of the following: (1) a "reverse" Bankart repair for posterior shoulder instability, (2) a Bankart repair for congenital (nontraumatic) laxity, (3) a revision Bankart repair, (4) follow-up after surgery of less than 8 months, and (5) a Bankart repair for glenoid bone loss of greater than 30%. All discrepancies were resolved through discussion until consensus was reached.

Data Extraction

Two investigators collected all relevant information regarding the publication date, journal, number of patients, average duration of follow-up, average patient age, Rowe or other shoulder evaluation score, redislocation rate, and return-to-sport timing. The investigators also made note of whether specific criteria were cited as a prerequisite for an athlete being allowed to RTP. Any information regarding specific sports RTP timing and requirements were also recorded.

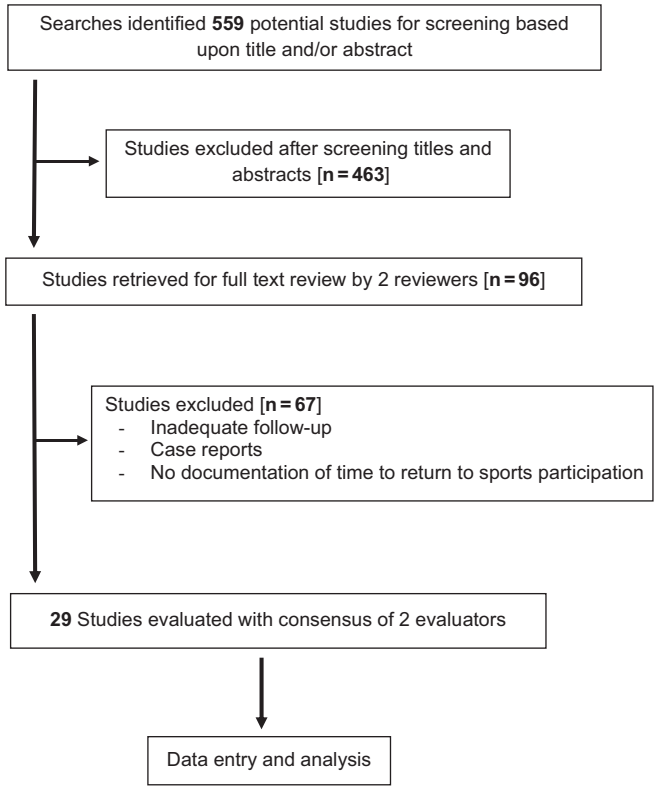

Figure 1. Flowchart of studies evaluated for return to sports participation after primary open Bankart repair.

Methodological Quality Assessment

No specific grading criteria were used to assess the methodological quality of each eligible study. All case reports were excluded. Randomized controlled trials (level 1), prospective comparative studies (level 2), retrospective comparative studies and case-control studies (level 3), and case series (level 4) were included in the analysis provided they met the inclusion criteria previously outlined.

Data Analysis

Means and standard deviations were calculated for all pertinent data for the entire group of included studies. Descriptive statistics were used to present grouped data as indicated.

RESULTS

Literature Search

Our literature search generated 559 relevant citations. Based on the title and/or abstract, 96 articles were screened.

TABLE 1
Mean Values for the Group of 31 Cited Studies of Primary Open Bankart Repair[a]

No. of Patients (n = 29)	Follow-up, mo (n = 29)	Age, y (n = 29)	Rowe Score (n = 15)	Constant Score (n = 1)	ASES Score (n = 1)	Good/Excellent Results (n = 12)	Percentage Redislocation (n = 21)
50 (12-162)	51.7 (8-336)	25.9 (21-31)	86.9 (63-90)	92	83	92.1 (70-100)	5.3 (0-11)

[a]Values in parentheses denote the range. ASES, American Shoulder and Elbow Score.

All 96 articles were individually reviewed by 2 reviewers, resulting in 29 articles that met the inclusion criteria and were included in this report (Figure 1).[2-5,7-20,22-33]

Study Characteristics

All studies were classified by their level of evidence. Of the 29 reports, 13% were randomized controlled studies (level 1); 20% were level 2, 13% level 3, and 54% level 4. The average number of patients for the entire cohort was 50 (range, 12-162). The average follow-up for the group was 51.7 months (range, 8-162 months). The average age for the cohort was 25.9 years (range, 21-31 years).[2-5,7-20,22-33]

Study Outcomes and Return to Play

Five major functional outcome measures were used for all or part of 28 of the 29 studies. The outcome measures cited were (1) Rowe score, (2) Constant score, (3) American Shoulder and Elbow Score (ASES), (4) good/excellent classification of function, and (5) redislocation rate. The 1 remaining study was a review and cited other reports but was not itself an independent study of open Bankart repair. The average Rowe score for all cited studies was 86.9 (range, 63-90). The average number of patients with a good/excellent outcome was 92.1% (range, 70% to 100%). The average redislocation rate was 5.3% (range, 0% to 11%). The Constant and ASES scores were reported for 1 study each, with scores of 92 and 83, respectively (Table 1).

Twenty-six of 29 studies cited a specific timetable for unrestricted RTP, with the average number of weeks reported being 23.2 (range, 12-36 weeks). Three studies did not report an absolute number of weeks after which athletes were allowed to return to unrestricted sports. Rather, these 3 studies cited a range of time. McCarty et al[21] reported in their review a range of 12 to 24 weeks for RTP. Montgomery and Jobe[22] reported an average of 48 weeks for return to sport with a range of 12 to 80 weeks. Finally, Fabre et al[9] reported 16 to 24 weeks for RTP for rugby, with 72% of athletes returning to contact sports by 20 weeks.

Sixty-two percent of studies cited no sport-specific criteria related to return to athletic competition. These reports simply outlined a time by which athletes could resume competition. Thirty-eight percent of studies (10 of 26) reported sport-specific criteria for return to competition. These measures are outlined in Table 2, with the majority of authors allowing return to noncontact sports by 12 to 16 weeks, and the resumption of throwing/contact sports by 24 weeks.[§] Three reports described specific functional parameters required before an athlete was allowed to participate in unrestricted sports participation. These included strength of the operated shoulder being equal or greater to 75% to 80% or "comparable" to the uninjured side (Table 2).[13,25,32]

DISCUSSION

The purpose of the current study was to review the orthopaedic literature regarding RTP parameters for athletes who have undergone an open Bankart repair for anterior instability. The frequency of open Bankart repair has diminished over the past decade because of the increased success and diminished morbidity of arthroscopic stabilization procedures. Historically, however, the open Bankart procedure has been shown to be both reliable and effective in preventing anterior dislocation.[3,4,9] Despite its reported success, little has been written regarding the timing of unrestricted athletic competition after an open Bankart repair. In addition, few reports have described specific parameters regarding sport-specific RTP.

The current study summarized 29 reports that were reviewed after a literature search from 1947 and 1990 to 2012 for OVID and PubMed databases, respectively. Beginning with 559 citations, 29 articles describing specific RTP criteria were screened by 2 authors. Our data revealed a wide variety of sports, including soccer, American football, baseball (throwing), and rugby. In summarizing the cohort, specific parameters were not outlined with regard to RTP for each individual sport. Rather, the majority of authors divided the RTP criteria into 2 sports categories: (1) noncontact and (2) contact/throwing. A limited number of authors (12%) also outlined requisite strength parameters required prior to participation.[13,25,32] With the limited numbers available, it was not possible to draw conclusions regarding the relationship between RTP timetables and outcomes reported. However, the current study does summarize the postoperative timetable used by surgeons to determine return to athletic competition after an open Bankart repair.

The current study has several limitations. There is significant heterogeneity among the cited studies, with 67% of reports being level 3 or 4 evidence. Although all cited

[§]References 7, 10, 11, 13, 15, 16, 20, 25, 32, 33.

TABLE 2
Summary of Return to Play Timetable for the Study Cohort (29 Studies)

Authors (Year)	Journal	No. of Patients	Follow-up, mo	Return to Play, wk	Comments
Ejerhed et al (2000)[7]	*Knee Surg Sports Traumatol Arthrosc*	33	28	24	Throwing/contact
Jørgensen et al (1999)[13]	*Knee Surg Sports Traumatol Arthrosc*	20	36	12	Comparable strength to opposite side
Farooq and Hafeez (2012)[10]	*J Coll Physicians Surg Pak*	14	8	Throwing, 16 Sports, 24	
Tjoumakaris et al (2006)[32]	*Clin Orthop Relat Res*	24	56	All sports, 24	Strength $\geq$80% of opposite side
Tamai et al (1999)[31]	*J Shoulder Elbow Surg*	87	46	All sports, 24	No specifications
Lai et al (2006)[15]	*Knee Surg Sports Traumatol Arthrosc*	82	56	No contact, 16 Contact, 24	No specifications
Strahovnik and Fokter (2006)[29]	*Wien Klin Wochenschr*	83	108	24	No specifications
Sachs et al (2005)[26]	*Am J Sports Med*	30	48	24	No specifications
Fabbriciani et al (2004)[8]	*Arthroscopy*	30	24	24	No specifications
Rhee et al (2007)[24]	*Am J Sports Med*	60	12	24	No specifications
Nowak et al (1998)[23]	*Acta Orthop Belg*	47	24	12+	No specifications
Gill et al (1997)[11]	*J Bone Joint Surg Am*	56	143	No contact, 16 Contact, 24	No specifications
Martínez Martín et al (1998)[20]	*Int Orthop*	44	30	No contact, 16 Contact, 24	No specifications
Takeda et al (1998)[30]	*Int Orthop*	25	60	24	No specifications
Warme et al (1999)[33]	*Am J Sports Med*	40	25	Contact, 24	No specifications
Karlsson et al (2001)[14]	*Am J Sports Med*	48	36	Contact, 24	No specifications
Magnusson et al (2002)[18]	*Am J Sports Med*	47	66	Contact, 24	No specifications
Dahabra (2005)[5]	*Saudi Med J*	60	28	All sports, 24	No specifications
Cetik et al (2006)[3]	*Acta Orthop Belg*	30	30	All sports, 24	No specifications
Lützner et al (2009)[17]	*Eur J Med Res*	159	31	$\sim$24	No specifications
Cooney et al (2009)[4]	*Int J Shoulder Surg*	24	56	22	No specifications
Boileau et al (2012)[2]	*Clin Orthop Relat Res*	64	25	24	No specifications
Guanche et al (1996)[12]	*Am J Sports Med*	12	25	16	No specifications
Rowe et al (1978)[25]	*J Bone Joint Surg Am*	162	72	Contact, 24	Strength $\geq$75%-80% of opposite side
Levine et al (1994)[16]	*Am J Sports Med*	32	42	Noncontact, 16 Contact, 24	No specifications
Mahiroğullari et al (2010)[19]	*Acta Orthop Traumatol Turc*	30	26	All sports, $\geq$24	
Average unrestricted return to play				**23.2 wk**	

reports utilized an open Bankart repair for anterior glenohumeral instability, there were a wide variety of anchors, soft tissue repairs, postoperative rehabilitation regimens, and surgical techniques used that varied among studies. There also was significant variability in the follow-up reported. The current study does not answer whether specific postoperative rehabilitation regimens and RTP times affect long-term shoulder outcomes. Finally, there was significant heterogeneity in the method of reporting outcomes among the various studies. The discrepancies in how authors reported patient function after surgery made it difficult to compare studies.

In summary, the current review summarized reported RTP guidelines for athletic competition after open Bankart repair. Twenty-nine studies were screened, with an average RTP time of 23.2 weeks. Based on this review of the literature, it appears that a majority of authors recommend unrestricted RTP after 23 weeks of surgery. Sports-specific and strength parameters were also outlined. These data may provide general guidelines to aid surgeons when determining the appropriate timetable to allow an athlete to return to unrestricted competition.

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