

The 50 Most-Cited Papers on Bankart Lesions



Kevin J. Bondar, B.S., Dhanur Damodar, M.D., Nicholas C. Schiller, M.S.,
Johnathon R. McCormick, M.D., Nolan B. Condron, B.S., Nikhil N. Verma, M.D., and
Brian J. Cole, M.D., M.B.A.

Purpose: To analyze the 50 most-cited articles pertaining to “Bankart lesions,” also known as anteroinferior labral tears, by means of citation analysis as well as to provide analysis and summary of the origins and trends of research on Bankart lesions. **Methods:** Scopus was used to query the literature on Bankart lesions. Included articles were related to Bankart lesions and the indications, risk factors, techniques, and outcomes of arthroscopic and open Bankart repair. The 50 most-cited articles were analyzed in the following areas: year of publication, citations in the most recent year, total citation count, contributing authors, institutions, countries, and journals, article classifications, and level of evidence. **Results:** Years of publication ranged from 1938 to 2013. There were 608 total citations in the most recent year. Total citation count was 12,441. Regarding country, journal, and authorship, United States, R. A. Arciero, and *Arthroscopy* were the highest respective contributors. Rush University had the greatest number of publications. The most common article classification was clinical outcomes. Of 49 clinical articles, the most frequent Level of Evidence was IV. The majority of the top 50 Bankart literature consisted of case series and retrospective studies performed in the United States. **Conclusions:** Our findings are consistent with the hypothesis that the 50 most-cited articles about Bankart lesions are predominantly U.S.-based, produced by academic orthopaedic groups, clinical outcomes articles, and of Level IV and V evidence. This list of articles should serve as a reference tool for any orthopaedist looking to review Bankart literature.

In 1923, Dr. Arthur Bankart first developed a surgical technique to treat recurrent anterior shoulder instability.¹ Over the years, repair of the Bankart lesion

has evolved with the concurrent progression of medical technologies. Although the modern technique differs from the original, today’s surgeons still incorporate Bankart’s original philosophy, which consists of an open repair with a coracoid osteotomy and subscapularis tenotomy and repair, aimed to stabilize the glenohumeral joint while maintaining range of motion.²

As scientific literature of the Bankart lesion continues to grow, it becomes more important to identify which articles have the greatest impact on shoulder surgeons and their practice and what articles trainees should be reading. One method to evaluate existing publications is by their academic importance. A commonly employed method to assess the academic importance of an article is analyzing the number of instances the work is referenced in other peer-reviewed manuscripts.³ The field of bibliometric analysis has been developed to provide this analysis and has become popularized as a means to provide a quantitative overview of literature. Moreover, a measure of scientific quality can be achieved through a topic-specific bibliometric citation analysis, which can provide an objective evaluation of the influence of publications in the field of interest. Understanding which of these articles have been cited the most can help to highlight their overarching impact

From the Department of Orthopedic Surgery, University of Miami Miller School of Medicine, Miami, Florida (K.J.B., N.C.S.); and Midwest Orthopaedics at Rush, Department of Orthopaedic Surgery, Rush University Medical Center, Chicago, Illinois (D.D., J.R.M., N.B.C., N.N.V., B.J.C.), U.S.A.

The authors report the following potential conflicts of interest or sources of funding: D.D. reports other from Southern Edge Orthopedics, outside the submitted work, N.N.V. reports other from Smith & Nephew and Stryker Corporation; and personal fees from Relieva Medsystems, outside the submitted work. B.J.C. reports other from Aesculap, National Institutes of Health, and Operative Techniques in Sports Medicine; personal fees from Ossio; personal fees and other from Regentis; other from Smith & Nephew; grants, personal fees, and other from Arthrex; and other from Elsevier publishing, BandGrip, Acumed LLC, Encore Medical, LP, GE Healthcare, Merck Sharp & Dohme Corporation, SportsTek Medical, and Vericel Corporation, outside the submitted work. Full ICMJE author disclosure forms are available for this article online, as [supplementary material](#).

Received November 18, 2020; accepted March 2, 2021.

Address correspondence to Brian J. Cole, M.D., M.B.A., 1611 W Harrison, Suite 300, Chicago, IL 60612. E-mail: bcollection@rushortho.com or cole.research@rushortho.com

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2666-061X/201855

<https://doi.org/10.1016/j.asmr.2021.03.001>

and allow practitioners to use the foremost works in the field when making clinical decisions.

Similar work has been completed in many other areas within orthopaedic surgery, giving quantitative importance and context to relevant topics in the field.⁴⁻⁸ This study aimed to analyze the 50 most-cited articles pertaining to “Bankart lesions,” also known as antero-inferior labral tears, by means of citation analysis as well as to provide analysis and summary of the origins and trends of research on Bankart lesions. We hypothesized that the majority of these top 50 Bankart articles would be of Level IV and V evidence, be published in the United States, be produced by academic orthopaedic groups, and be clinical outcomes articles.

Methods

Elsevier’s Scopus database was used for this bibliometric analysis. Scopus is a comprehensive indexing and citation database that contains articles across a variety of disciplines including medicine. The database covers all of EMBASE and Compendex content. Moreover, the database provides advanced search options and allows search results to be sorted by number of times cited. The database is updated daily. A side-by-side comparison with the Web of Science and Scopus databases showed increased depth of coverage for Web of Science; however, Scopus provides an intuitive search system and increased search results for specific medical conditions; thus, Scopus was used for this study.⁹ Queries were conducted in May of 2020. We incorporated a broad string of search phrases and conducted multiple queries. Search terms included the following: anterior shoulder instability, arthroscopic Bankart, open Bankart, anterior inferior labrum, Bankart, bony Bankart, and Bankart repair. The query results were sorted by highest-to-lowest number of citations and titles were sequentially reviewed in Scopus. Inclusion criteria were as follows: (1) article titles were available in English, (2) article titles pertained to the Bankart lesion or the indications, risk factors, techniques, or outcomes of arthroscopic or open Bankart repair, and (3) articles were published in peer-reviewed journals. There was no restriction on date or country of publication, journal source, or authorship. Article titles meeting inclusion criteria were placed into a separate list in Scopus and exported to Microsoft Excel (Microsoft Corp., Redmond, WA) for abstract review. The abstract of each article was reviewed by 2 authors independently. Articles in which either Bankart lesion or Bankart repair was not the primary topic were excluded. Included articles discussed recurrent anterior glenohumeral dislocations, and specifically the glenoid tear, known as the Bankart lesion. Included articles discussed the soft-tissue Bankart lesion, defined as an avulsion damage of the glenoid rim, or the bony Bankart lesion, defined as a fracture of the

anteroinferior glenoid rim. Articles pertaining more generally to anterior glenohumeral dislocations, multi-directional dislocations, anterior shoulder instability, poor osseous congruency, capsular laxity, or bone loss were excluded. Articles pertaining to SLAP lesions, rotator cuff tears, impingement, cuff frying, and ALPSA lesions were excluded. Articles pertaining to the posterior/reverse Bankart were excluded. For any discrepancies among reviewers’ decisions, full manuscripts were reviewed and the decision to include or exclude was made by the more senior author. The 50 most-cited articles were included in the analysis (Fig 1).

A saved list was created within the Scopus database that contained the 50 most-cited articles, and the citation data were recalculated once more to avoid any errors.

The 50 most-cited articles were assessed for the following metrics: year of publication, citations in the most recent year, total number of citations, citations per year, authorship frequency, contributing institutions (author affiliations at the time of publication), source journals, author-determined article topic, classification, and country of origin. In addition, author review was used to determine the level of evidence (LOE), study design, and article classification of each article. LOE was assigned based on guidelines from *The Journal of Bone and Joint Surgery*.^{6,10} Study design assignments were as follows: case report, case series, cohort study, review article, case–control study, randomized control trial, nonrandomized control trial, basic science paper, and expert opinion. Article classifications were as follows: clinical outcomes, surgical technique article, anatomy/biomechanical, imaging, classification, clinical guidelines, and natural history. Multiauthor review was conducted with the corresponding author arbitrating the final decision for any disagreements in data. Tables and figures were created using Microsoft Word (Microsoft Corp.).

To highlight articles published after 2000, the top 10 most-cited articles published in or after 2000 were filtered into a separate list and ranked by the number of citations per year.

Results

The total number of citations for all included articles was 12,441, with 608 citations in 2019. The range of total citations for each article was 95 to 1056. The number of citations per year ranged from 3.65 to 52.8, with an average of 12.1 (Table 1).¹¹⁻⁶⁰ The number of citations in 2019 ranged from 1 to 73. In total, 49 of 50 articles were evidence-based, noncadaveric, clinical research articles that were assigned a LOE. The most common LOE was IV (n = 29) (Fig 2). Case series was the most common study design (n = 19). In terms of institutional affiliation, authors from Midwest

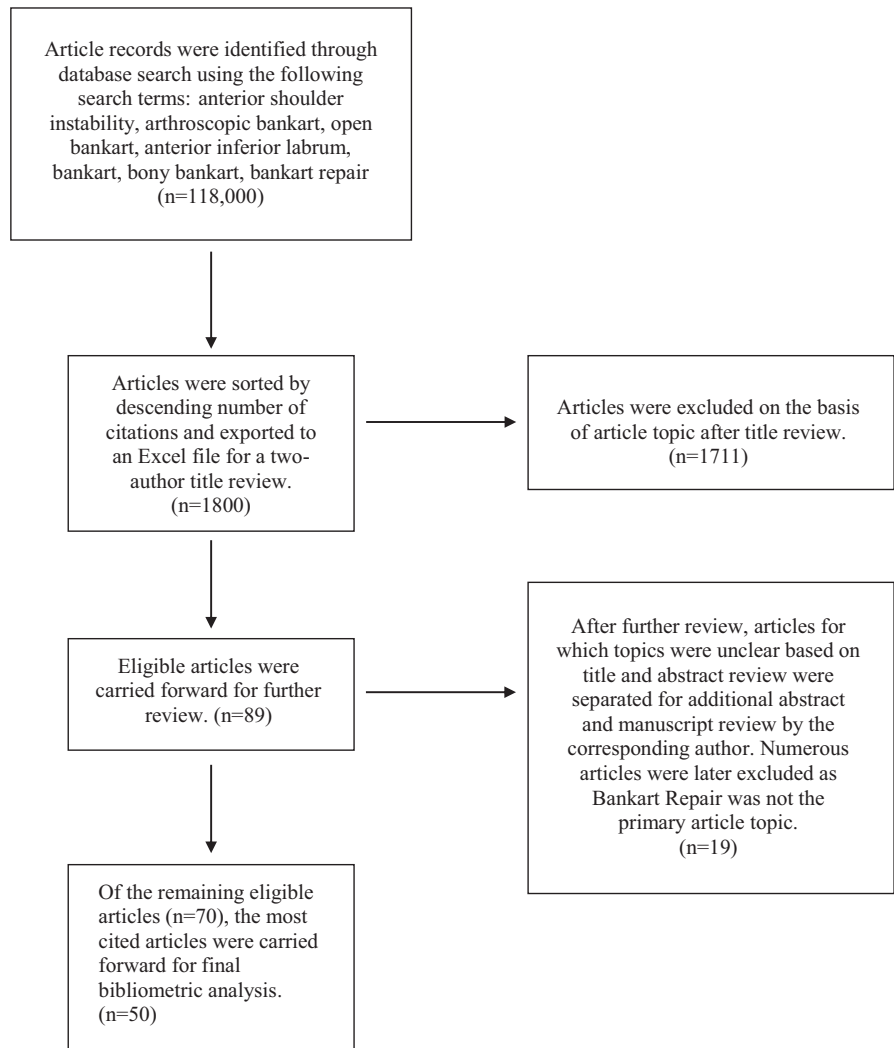


Fig 1. A Modified Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram detailing the collection process for the top 50 most-cited articles on Bankart lesions and Bankart repair.

Orthopedics at Rush University contributed the most publications ($n = 5$).

In the analysis of articles cited in the last 20 years, ranked by most-cited articles per year, Burkhart's "Traumatic Glenohumeral Bone Defects and Their Relationship to Failure of Arthroscopic Bankart Repairs: Significance of the Inverted-Pear Glenoid and the Humeral Engaging Hill–Sachs Lesion" was the most cited (Table 2).¹¹

In terms of the source journals, *Arthroscopy: The Journal of Arthroscopic and Related Surgery* ($n = 16$) contained the majority of articles within the top 50 list. The *American Journal of Sports Medicine* ($n = 15$) and the *Journal of Bone and Joint Surgery* ($n = 11$) contained the second and third highest numbers of articles within our top 50 list.

The most frequent article type was clinical outcomes, ($n = 23$). The other predominant article types were surgical technique ($n = 11$), imaging ($n = 4$), and anatomy/biomechanics ($n = 3$) (Fig 3). The majority of

articles were written in the United States ($n = 23$) (Fig 4). Year of publication ranged from 1938 to 2013, with 2000-2009 ($n = 22$) and 1990-1999 ($n = 20$) being the 2 most common decades of publication (Fig 5). R. A. Arciero ($n = 5$), B. J. Cole ($n = 4$), B. R. Bach ($n = 3$), S. S. Burkhart ($n = 3$), A. A. Romeo ($n = 3$), and J. P. Warner ($n = 3$) were the most prolific authors. Authorship role or order was not considered in the evaluation of the most prolific authors. Any authorship position was counted as a contribution. The majority of articles were published in the United States ($n = 32$), followed by Japan ($n = 3$), Sweden ($n = 3$), and South Africa ($n = 3$). In articles involving multinational collaborations, all contributing countries were counted, providing the article had at least one author from an institution in that country.

Discussion

The vast majority of the top 50 Bankart articles were published in the United States, and 32% of those

Table 1. 50 Most-Cited Publications

Rank	Publication	Total Citations	Citations/Year of Publication Until 2020	Citations In 2019
1	Burkhart SS, De Beer JF. Traumatic glenohumeral bone defects and their relationship to failure of arthroscopic Bankart repairs: Significance of the inverted-pear glenoid and the humeral engaging Hill-Sachs lesion. <i>Arthroscopy</i> 2000;16:677-694. ¹¹	1056	52.8	73
2	Boileau P, Villalba M, Héry JY, Balg F, Ahrens P, Neyton L. Risk factors for recurrence of shoulder instability after arthroscopic bankart repair. <i>J Bone Joint Surg Am</i> 2006;88:1755-1763. ¹²	582	40.64	51
3	Bankart ASB. The pathology and treatment of recurrent dislocation of the shoulder-joint. <i>Br J Surg</i> 1938;26:23-29. ¹³	569	7.1	14
4	Itoi E, Lee SB, Berglund LJ, Berge LL, An KN. The effect of a glenoid defect on anteroinferior stability of the shoulder after Bankart repair: A cadaveric study. <i>J Bone Joint Surg Am</i> 2000;82:35-46. ¹⁴	523	26.15	36
5	Hovellius L, Augustini BG, Fredin H, Johansson O, Norlin R, Thorling J. Primary anterior dislocation of the shoulder in young patients: A ten-year prospective study. <i>J Bone Joint Surg Am</i> 1996;78:1677-1684. ¹⁵	481	20.04	24
6	Balg F, Boileau P. The instability severity index score: A simple pre-operative score to select patients for arthroscopic or open shoulder stabilisation. <i>J Bone Joint Surg Br</i> 2007;89:1470-1477. ¹⁶	428	32	41
7	Sugaya H, Moriishi J, Dohi M, Kon Y, Tsuchiya A. Glenoid rim morphology in recurrent anterior glenohumeral instability. <i>J Bone Joint Surg Am</i> 2003;85:878-884. ¹⁷	416	25.18	36
8	Latarjet M. Treatment of recurrent dislocation of the shoulder. <i>Lyon Chir</i> 1954;49:994-997. ¹⁸	399	6.05	35
9	Rowe CR, Zarins B, Ciullo JV. Recurrent anterior dislocation of the shoulder after surgical repair. Apparent causes of failure and treatment. <i>J Bone Joint Surg Am</i> 1984;66:159-168. ¹⁹	380	10.56	5
10	Burkhart SS, De Beer JF, Barth JRH, Criswell T, Roberts C, Richards DP. Results of modified latarjet reconstruction in patients with anteroinferior instability and significant bone loss. <i>Arthroscopy</i> 2007;23:1033-1041. ²⁰	339	26.08	27
11	Bigliani LU, Newton PM, Steinmann SP, Connor PM, McIlveen SJ. Glenoid rim lesions associated with recurrent anterior dislocation of the shoulder. <i>Am J Sports Med</i> 1998;26:41-45. ²¹	338	15.36	12
12	Taylor DC, Arciero RA. Pathologic changes associated with shoulder dislocations. Arthroscopic and physical examination findings in first-time, traumatic anterior dislocations. <i>Am J Sports Med</i> 1997;25:306-311. ²²	318	13.83	12
13	Arciero RA, Wheeler JH, Ryan JB, McBride JT. Arthroscopic Bankart repair versus nonoperative treatment for acute, initial anterior shoulder dislocations. <i>Am J Sports Med</i> 1994;22:589-594. ²³	312	12	16
14	Chandnani VP, Yeager TD, DeBerardino T, et al. Glenoid labral tears: Prospective evaluation with MR imaging, MR arthrography, and CT arthrography. <i>AJR Am J Roentgenol</i> 1993;161:1229-1235. ²⁴	296	10.96	6
15	Cole BJ, L'Insalata J, Irrgang J, Warner JJP. Comparison of arthroscopic and open anterior shoulder stabilization: A two to six-year follow-up study. <i>J Bone Joint Surg Am</i> 2000;82:1108-1114. ²⁵	262	12.8	10
16	Bottoni CR, Wilckens JH, DeBerardino TM, et al. A prospective, randomized evaluation of arthroscopic stabilization versus nonoperative treatment in patients with acute, traumatic, first-time shoulder dislocations. <i>Am J Sports Med</i> 2002;30:576-580. ²⁶	261	14.22	18
17	Burkhart SS, DeBeer JF, Tehrany AM, Parten PM. Quantifying glenoid bone loss arthroscopically in shoulder instability. <i>Arthroscopy</i> 2002;18:488-491. ²⁷	257	14.1	12
18	Gartsman GM, Roddey TS, Hammerman SM. Arthroscopic treatment of anterior-inferior glenohumeral instability. Two to five-year follow-up. <i>J Bone Joint Surg Am</i> 2000;82:991-1003. ²⁸	256	13.05	9
19	Hovellius L, Eriksson K, Fredin H, et al. Recurrences after initial dislocation of the shoulder. Results of a prospective study of treatment. <i>J Bone Joint Surg Am</i> 1983;65:343-349. ²⁹	256	6.95	5
20	Morgan CD, Bodenstab AB. Arthroscopic bankart suture repair: Technique and early results. <i>Arthroscopy</i> 1987;3:111-122. ³⁰	254	7.94	4
21	Mazzocca AD, Brown Jr FM, Carreira DS, Hayden J, Romeo AA. Arthroscopic anterior shoulder stabilization of collision and contract athletes. <i>Am J Sports Med</i> 2005;33:52-60. ³¹	230	15.07	16

(continued)

Table 1. Continued

Rank	Publication	Total Citations	Citations/Year of Publication Until 2020	Citations In 2019
22	Baker CL, Uribe JW, Whitman C. Arthroscopic evaluation of acute initial anterior shoulder dislocations. <i>Am J Sports Med</i> 1990;18:25-28. ³²	226	7.67	3
23	Wheeler JH, Ryan JB, Arciero RA, Molinari RN. Arthroscopic versus nonoperative treatment of acute shoulder dislocations in young athletes. <i>Arthroscopy</i> 1989;5:213-217. ³³	218	6.9	12
24	Kirkley A, Griffin S, Richards C, Miniaci A, Mohtadi N. Prospective randomized clinical trial comparing the effectiveness of immediate arthroscopic stabilization versus immobilization and rehabilitation in first traumatic anterior dislocations of the shoulder. <i>Arthroscopy</i> 1999;15:507-514. ³⁴	217	10.38	6
25	Fabbriciani C, Milano G, Demontis A, Fadda S, Ziranu F, Mulas PD. Arthroscopic versus open treatment of Bankart lesion of the shoulder: A prospective randomized study. <i>Arthroscopy</i> 2004;20:456-462. ³⁵	214	13.56	9
26	Grana WA, Buckley PD, Yates CK. Arthroscopic Bankart suture repair. <i>Am J Sports Med</i> 1993;21:348-353. ³⁶	186	6.89	0
27	Bacilla P, Field LD, Savoie Iii FH. Arthroscopic Bankart repair in a high demand patient population. <i>Arthroscopy</i> 1997;13:51-60. ³⁷	183	7.65	6
28	Bottoni CR, Smith EL, Berkowitz MJ, Towle RB, Moore JH. Arthroscopic versus open shoulder stabilization for recurrent anterior instability: A prospective randomized clinical trial. <i>Am J Sports Med</i> 2006;34:1730-1737. ³⁸	176	13.07	11
29	Yiannakopoulos CK, Mataragas E, Antonogiannakis E. A Comparison of the Spectrum of Intra-articular Lesions in Acute and Chronic Anterior Shoulder Instability. <i>Arthroscopy</i> 2007;23:985-990. ³⁹	175	13.46	14
30	Sugaya H, Moriishi J, Kanisawa I, Tsuchiya A. Arthroscopic osseous Bankart repair for chronic recurrent traumatic anterior glenohumeral instability. <i>J Bone Joint Surg Am</i> 2005;87:1752-1760. ⁴⁰	160	10.13	9
31	Legan JM, Burkhard TK, Goff Ii WB, et al. Tears of the glenoid labrum: MR imaging of 88 arthroscopically confirmed cases. <i>Radiology</i> 1991;179:241-246. ⁴¹	154	5.52	1
32	Green MR, Christensen KP. Arthroscopic versus open bankart procedures: A comparison of early morbidity and complications. <i>Arthroscopy</i> 1993;9:371-374. ⁴²	153	5.70	2
33	Harris JD, Gupta AK, Mall NA, et al. Long-term outcomes after bankart shoulder stabilization. <i>Arthroscopy</i> 2013;29:920-933. ⁴³	152	20.43	15
34	Lenters TR, Franta AK, Wolf FM, Leopold SS, Matsen Iii FA. Arthroscopic compared with open repairs for recurrent anterior shoulder instability: A systematic review and meta-analysis of the literature. <i>J Bone Joint Surg Am</i> 2007;89:244-254. ⁴⁴	143	11.77	8
35	Hawkins RB. Arthroscopic stapling repair for shoulder instability: A retrospective study of 50 cases. <i>Arthroscopy</i> 1989;5:122-128. ⁴⁵	138	4.45	0
36	Freedman KB, Smith AP, Romeo AA, Cole BJ, Bach Jr. BR. Open Bankart repair versus arthroscopic repair with transglenoid sutures or bioabsorbable tacks for recurrent anterior instability of the shoulder: A meta-analysis. <i>Am J Sports Med</i> 2004;32:1520-1527. ⁴⁶	130	8.13	2
37	Guanche CA, Quick DC, Sodergren KM, Buss DD. Arthroscopic versus open reconstruction of the shoulder in patients with isolated bankart lesions. <i>Am J Sports Med</i> 1996;24:144-148. ⁴⁷	129	5.38	1
38	Porcellini G, Campi F, Paladini P. Arthroscopic approach to acute bony Bankart lesion. <i>Arthroscopy</i> 2002;18:764-769. ⁴⁸	126	6.94	8
39	Pagnani MJ, Warren RF, Altchek DW, Wickiewicz TL, Anderson AF. Arthroscopic shoulder stabilization using transglenoid sutures. A four- year minimum followup. <i>Am J Sports Med</i> 1996;24:459-467. ⁴⁹	125	5.17	2
40	Karlsson J, Magnusson L, Ejerhed L, Hultenheim I, Lundin O, Kartus J. Comparison of open and arthroscopic stabilization for recurrent shoulder dislocation in patients with a bankart lesion. <i>Am J Sports Med</i> 2001;29:538-542. ⁵⁰	124	6.32	3
41	O'Neill DB, Nassau Bay T. Arthroscopic Bankart repair of anterior detachments of the glenoid labrum: A prospective study. <i>J Bone Joint Surg Am</i> 1999;81:1357-1366. ⁵¹	122	6	3
42	Habermeyer P, Gleyze P, Rickert M. Evolution of lesions of the labrum-ligament complex in posttraumatic anterior shoulder instability: A prospective study. <i>J Shoulder Elbow Surg</i> 1999;8:66-74. ⁵²	121	5.57	9
43	Hintermann B, Gächter A. Arthroscopic findings after shoulder dislocation. <i>Am J Sports Med</i> 1995;23:545-551. ⁵³	120	4.88	2
44	Yong GR, Jeong HH, Nam SC. Anterior shoulder stabilization in collision athletes: Arthroscopic versus open bankart repair. <i>Am J Sports Med</i> 2006;34:979-985. ⁵⁴	117	8.64	9

(continued)

Table 1. Continued

Rank	Publication	Total Citations	Citations/Year of Publication Until 2020	Citations In 2019
45	Wolf EM, Wilk RM, Richmond JC. Arthroscopic Bankart repair using suture anchors. <i>Oper Tech Orthop</i> 1991;1:184-191. ⁵⁵	114	3.93	4
46	Arciero RA, Taylor DC, Snyder RJ, Uhorchak JM. Arthroscopic bioabsorbable tack stabilization of initial anterior shoulder dislocations: A preliminary report. <i>Arthroscopy</i> 1995;11:410-417. ⁵⁶	106	4.16	1
47	Guanche CA, Jones DC. Clinical testing for tears of the glenoid labrum. <i>Arthroscopy</i> 2003;19:517-523. ⁵⁷	104	6.24	2
48	Cordasco FA, Steinmann S, Flatow EL, Bigliani LU. Arthroscopic treatment of glenoid labral tears. <i>Am J Sports Med</i> 1993;21:425-431. ⁵⁸	101	3.74	1
49	Cole BJ, Warner JJP. Arthroscopic versus open Bankart repair for traumatic anterior shoulder instability. <i>Clin Sports Med</i> 2000;19:19-48. ⁵⁹	99	4.95	2
50	Warner JJP, Kann S, Marks P. Arthroscopic repair of combined Bankart and superior labral detachment anterior and posterior lesions: Technique and preliminary results. <i>Arthroscopy</i> 1994;10:383-391. ⁶⁰	95	3.65	1

articles were published in *Arthroscopy: The Journal of Arthroscopic and Related Surgery*. Given that most articles were Level IV and V evidence, there is still a glaring lack of Level I data on this topic. As expected, clinical outcomes articles were the most-cited articles, which is consistent with the importance of data that can be applied to our practices. Rush University had both the greatest institutional publication number as well as 2 of the 3 most published authors in this analysis, demonstrating that access to an academic medical center can assist in the publication of highly cited research.

Although total citation number is not the only, or most important metric used to assess scientific articles, it can be an indication of the impact and influence of a particular article.⁶¹ Our review of the top 50 articles pertaining to Bankart lesions shows not only the most seminal papers in the advancement of surgical techniques and outcomes but also provides historical perspective and a demonstration of the institutions and authors that have contributed to research in this particular field. With the wide array of peer-reviewed literature, it can be difficult for trainees and

educators to sift through and find the greatest-impact publications. This particular study provides a concise list of the most impactful papers regarding Bankart lesions, and by proxy, anterior shoulder instability.

In 2000, Burkhart published a classic article in *Arthroscopy* that remains the most frequently cited article of the top 50 Bankart papers. This article assessed the causes of recurrent instability or failure after an arthroscopic Bankart repair.¹¹ The prevailing notion at the time was that poor techniques in arthroscopic soft-tissue fixation was the culprit; however, Burkhart disproved this theory and showed that the inherent issue with failure of arthroscopic Bankart repairs is instead due to engaging Hill–Sachs lesions and the “inverted pear” Bankart lesion of the glenoid. This study used a qualitative approach to assessing glenoid bone loss (GBL). The authors concluded that patients with significant GBL and engaging Hill–Sachs lesions are not candidates for arthroscopic Bankart repair and should be treated with a bony augmentation procedure such as the Latarjet procedure. From this landmark article came further studies exploring the concept of

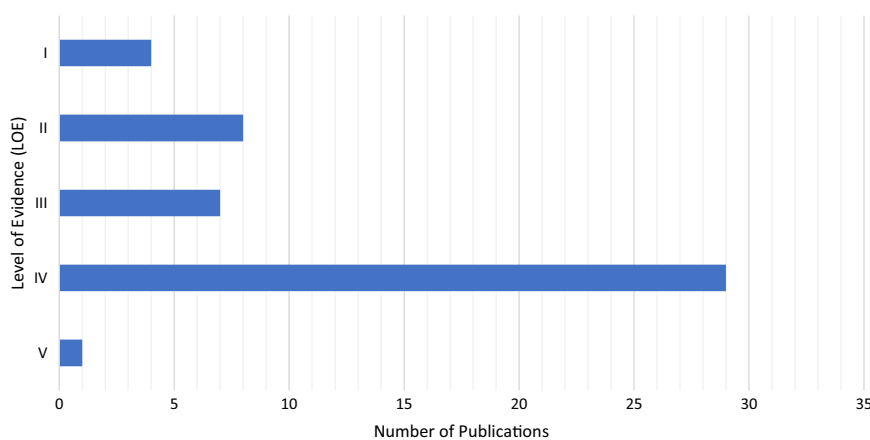


Fig 2. Graphical depiction of the level of evidence of each of the top 50 most-cited articles.

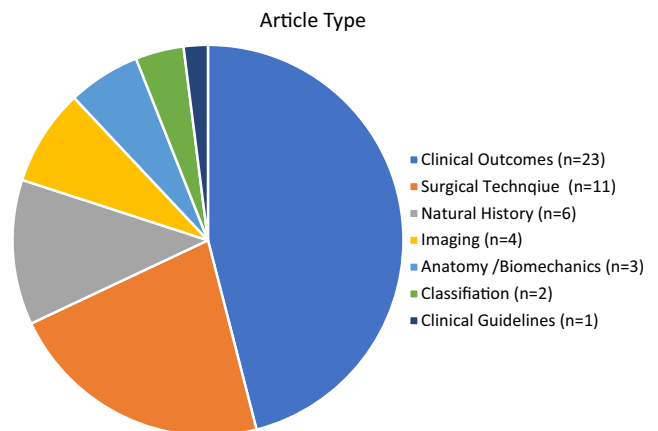
Table 2. Most-Cited Publications Per Year from the Past 20 Years

Rank	Publication	Total Citations	Citations/Year of Publication Until 2020	Citations In 2019
1	Burkhart SS, De Beer JF. Traumatic glenohumeral bone defects and their relationship to failure of arthroscopic Bankart repairs: Significance of the inverted-pear glenoid and the humeral engaging Hill-Sachs lesion. <i>Arthroscopy</i> 2000;16:677-694. ¹¹	1056	52.8	73
2	Boileau P, Villalba M, Héry JY, Balg F, Ahrens P, Neyton L. Risk factors for recurrence of shoulder instability after arthroscopic bankart repair. <i>J Bone Joint Surg Am</i> 2006;88:1755-1763. ¹²	569	40.64	51
3	Balg F, Boileau P. The instability severity index score: A simple pre-operative score to select patients for arthroscopic or open shoulder stabilisation. <i>J Bone Joint Surg Br</i> 2007;89:1470-1477. ¹⁶	416	32	41
4	Itoi E, Lee SB, Berglund LJ, Berge LL, An KN. The effect of a glenoid defect on anteroinferior stability of the shoulder after Bankart repair: A cadaveric study. <i>J Bone Joint Surg Am</i> 2000;82:35-46. ¹⁴	523	26.15	36
5	Burkhart SS, De Beer JF, Barth JRH, Criswell T, Roberts C, Richards DP. Results of modified Latarjet reconstruction in patients with anteroinferior instability and significant bone loss. <i>Arthroscopy</i> 2007;23:1033-1041. ²⁰	339	26.08	27
6	Sugaya H, Moriishi J, Dohi M, Kon Y, Tsuchiya A. Glenoid rim morphology in recurrent anterior glenohumeral instability. <i>J Bone Joint Surg Am</i> 2003;85:878-884. ¹⁷	428	25.18	36
7	Harris JD, Gupta AK, Mall NA, et al. Long-term outcomes after bankart shoulder stabilization. <i>Arthroscopy</i> 2013;29:920-933. ⁴³	143	20.43	15
8	Mazzocca AD, Brown Jr FM, Carreira DS, Hayden J, Romeo AA. Arthroscopic anterior shoulder stabilization of collision and contract athletes. <i>Am J Sports Med</i> 2005;33:52-60. ³¹	226	15.07	16
9	Bottoni CR, Wilckens JH, DeBerardino TM, et al. A prospective, randomized evaluation of arthroscopic stabilization versus nonoperative treatment in patients with acute, traumatic, first-time shoulder dislocations. <i>Am J Sports Med</i> 2002;30:576-580. ²⁶	256	14.22	18
10	Burkhart SS, DeBeer JF, Tehrany AM, Parten PM. Quantifying glenoid bone loss arthroscopically in shoulder instability. <i>Arthroscopy</i> 2002;18:488-491. ²⁷	254	14.11	12

GBL and the “glenoid track.”⁶² Now, in 2021, we have more sophisticated ways to measure GBL and clearer algorithms to use in treating these lesions. The newest analysis of this issue focuses on both GBL and humeral head bone loss (bipolar lesions); however, there still remains significant debate over the treatment of borderline bipolar lesions with respect to remplissage versus bony augmentation.⁶³

At times throughout postgraduate training, it may be difficult and time-consuming for trainees to search through the vast peer-reviewed literature to find influential manuscripts. One of the aims of this current project was to provide a concise, high-impact reading list to residents, fellows, and attending physicians on the topic of Bankart lesions. By using bibliometric analysis to determine the most-cited manuscripts, we were able to objectively compile important papers for orthopaedic surgeons to quickly and easily reference. For example, in 1938, Bankart described the pathology and treatment of recurrent dislocations of the shoulder in his *British Journal of Surgery* article.¹³ This historic manuscript laid the groundwork for the field of anterior shoulder instability and through the description of the characteristic Bankart lesion. Bankart’s manuscript continues to be cited multiple times per year in newly published research and is the third most-cited paper in

this analysis. Similarly, Latarjet published his procedure for stabilization of recurrent dislocation in 1954, which remains the 8th most-cited paper on this topic.¹⁸ In his paper, Latarjet describes the now frequently used coracoid transfer for anterior–inferior glenoid bone loss (bony Bankart lesion). While there are some publications with historical significance on this list, another aim of this bibliometric analysis was to delineate

**Fig 3.** Graphical depiction of the frequency of each article classification for the top 50 most-cited articles.

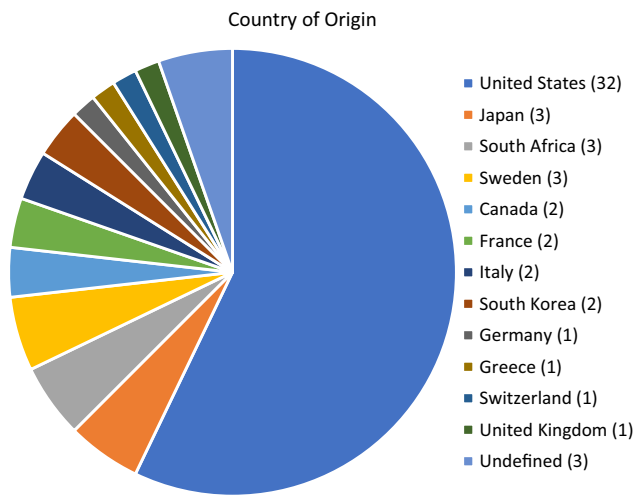


Fig 4. Graphical depiction of the countries of origin for each of the top 50 most-cited articles.

research published in the 2000s to provide readers with insight into past, ongoing, and future directions of the field. To that end, Table 2 was constructed to provide physicians with a list of publications that have consistently been the most cited over the last 2 decades. Furthermore, a distinction must be made between manuscripts with a high level of evidence and those with a high number of citations. Only 25% of the manuscripts in this study were designated as LOE II or greater, whereas the majority (59%) were Level IV (Fig 2). It is important to be aware of LOE when critically appraising a study, analyzing its outcomes, and the ability to answer the study question.¹⁰ Although the pinnacle of scholarly work is a paper with both high LOE and high clinical impact, our analysis shows that papers with low LOE are actually cited more frequently. It is likely that these studies are sentinel investigations with powerful findings that open doors for subsequent

research. It is also true that not all research questions require a high LOE to be answered effectively, which does not render them any less important to the body of literature within a field.

Our analysis included all contributing journals, provided that papers were written in English. The analysis showed that *Arthroscopy*, *The Journal of Bone and Joint Surgery*, and the *American Journal of Sports Medicine* contained 42 (84%) of the articles within the Top 50 list, a finding which demonstrates the major impact and influence of these three journals within the literature on Bankart repair. *Arthroscopy* had an impressive 32% of the top 50 papers published. These 3 journals are among the 5 most impactful journals within the field of orthopaedic surgery, based on Clarivate Analytics Journal Impact Factors. Journal Impact Factor is a well-established citation metric that ranks articles by the number of citations over a specified time period.^{64,65} Our findings indicated that the most highly cited articles on Bankart lesions originated from the journals with the highest impact factors. Interestingly, previous literature has suggested that Impact Factor does accurately predict the individual paper citation rate within the orthopaedic literature. However, the relative citation rate, which provides a standard citation rate by comparing the citation rates from articles in a particular field with a peer comparison group, may be a more effective metric of the influence of individual articles.⁶⁶⁻⁶⁸ It is not surprising that a plurality of the top 50 articles were found in *Arthroscopy*, as Bankart repairs are now most commonly performed in an arthroscopic manner.⁶⁹ Our findings showed that the most common article classifications within the top 50 list were clinical outcomes (n = 23) and surgical techniques (n = 11). This is consistent with the aim of *Arthroscopy*, to provide perspective on arthroscopic techniques and describe the clinical efficacy of these procedures.

Publications Per Decade

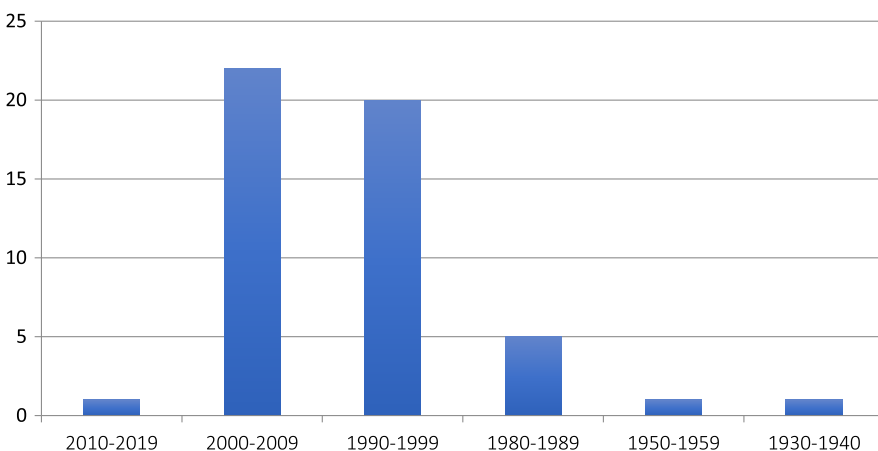


Fig 5. Graphical depiction of the number of articles published within each decade between 1930 and 2019. Decades in which at least 1 article was published are included.

Among the top 50 articles, R. A. Arciero contributed to 5 publications, B. J. Cole contributed to 4 publications, and B. R. Bach contributed to 3 publications. The latter 2 authors are associated with the most contributive institution, Rush University (n = 5). Of note, 2 military-based medical centers, Tripler (n = 4) and West Point (n = 3), were the second and third highest contributing institutions within our top 50 list. This is not surprising, given that Bankart lesions occur frequently among young, active military members.^{70,71} The maximum number of articles contributed by one institution was 5, indicating that the most influential literature about Bankart lesions has been produced from a wide array of academic centers. The United States (n = 32) was the most productive nation; however, this finding may be impacted by English-language bias as our search was restricted to articles written and translated to English. The majority of the articles (n = 42; 84%) were published between 1990 and 2010, suggesting that surgical techniques have been more frequently discussed in recent decades since the first description of the Bankart lesion in 1923. The scarcity of literature published since 2010 (n = 1) may be attributed to publication skew as there has been insufficient time for articles published within the last 10 years to accrue a large number of cumulative citations. Over the coming years more recent articles will likely become “classic” articles in the field as the surgical techniques continue to develop. Also, the rapid influx of online literature over the last 20 years may prevent individual articles from accruing as many citations as articles in previous decades.

Limitations

There were several limitations in this study. First, using citation analysis may not be the most representative indicator of the influence of a given journal article. Second, as with all bibliometric reviews, citation analysis is skewed toward older articles due to increased lead time for citations compared with more recently published articles. Conversely, citation data may be underestimated for much older articles. The Scopus Cited Reference expansion program in 2014 has helped to provide citation data for older references; however, older articles such as Bankart’s 1923 article may have accrued more citations than the number of citations recorded by Scopus.^{1,72} Moreover, as with any bibliometric review, the search results are limited by the selected search phrases and the databases used.

Future Directions

Future studies may evaluate the research productivity and trajectory of notable research teams and institutions identified in this study. Additional studies may compare the efficacy of databases such as Web of Science and Scopus in accurately identifying the most-cited articles

on a given topic. Moreover, further research may include expert opinion commentary on the top 50 papers detailed in this study.

Conclusions

Our findings are consistent with the hypothesis that the 50 most-cited articles about Bankart lesions are predominantly U.S.-based, produced by academic orthopaedic groups, clinical outcomes articles, and of Level IV and V evidence. This list of articles should serve as a reference tool for any orthopaedist looking to review Bankart literature.

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