



Systematic review

The most influential papers in direct anterior approach to total hip arthroplasty

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ABSTRACT

Background: Citation analysis is a commonly used method for appraising the impact of academic publications within a particular field of study. A gap exists in the citation analysis literature with regard to the topic of direct anterior approach (DAA) hip arthroplasty. The purpose of this study is to identify the 50 most frequently cited publications related to this topic.

Methods: The Clarivate Analytics Web of Knowledge database was utilized to search for publications relating to DAA hip arthroplasty. The top 50 most cited articles that met inclusion criteria were recorded and reviewed for various metrics.

Results: The top 50 publications were cited a total of 3521 times, with an average of 86.3 total citations per year between 1980 and 2019. 47 of the 50 articles identified had been published since the year 2000. Cohort designs were the most common study type.

Conclusions: This analysis provides insight into factors that characterize highly cited articles on the specific topic of DAA hip arthroplasty. These factors include higher levels of evidence, recent publication, and origin in the United States. Citations of DAA hip arthroplasty papers appear to be on the rise. The curation and analysis of this set of 50 articles will provide orthopaedic surgery clinicians, researchers, and residency program directors a guide for quickly isolating influential articles on the topic of DAA hip arthroplasty. This may serve as a quick reference for clinical decision-making, foundation for further research, and curriculum on DAA hip arthroplasty.

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Introduction

The direct anterior approach (DAA) to the hip as it is used today was first described in 1881 by German surgeon Carl Hueter as a muscle sparing internervous approach to address hip pathology including arthroplasty [1]. Marius N. Smith-Petersen provided the first description of the DAA in English-speaking literature in 1917 and then first applied this approach to mold hip arthroplasty in the 1940s [2–5]. The presence of DAA hip arthroplasty in the literature began to grow during the 1980s with further foundational contributions coming from Light and Keggi and the Judets [6–8]. Use of a fracture table for fluoroscopically assisted implant placement, and a

growing interest in minimally invasive techniques has caused the popularity of DAA hip arthroplasty to surge in the last 15 years [9–11]. With early success, the demand for DAA hip arthroplasty has increased, resulting in an increase in the published literature on the approach [12].

Citation analysis is a commonly used method for appraising the impact of academic publications within a particular field of study [13–16]. Several previous studies have applied citation analysis to describe influential papers on various topics within orthopaedics including specific procedures, pathologies, or subspecialties [17–24]. Two such studies examine hip and knee arthroplasty together, one looking at the top 50 most cited publications on the topic and the other analyzing the top 100 [21,25]. Another study evaluated orthopaedic hip research in its entirety and included many articles pertaining to total hip arthroplasty [17]. However, of these 3 articles, none of the investigated papers pertain to DAA hip arthroplasty specifically.

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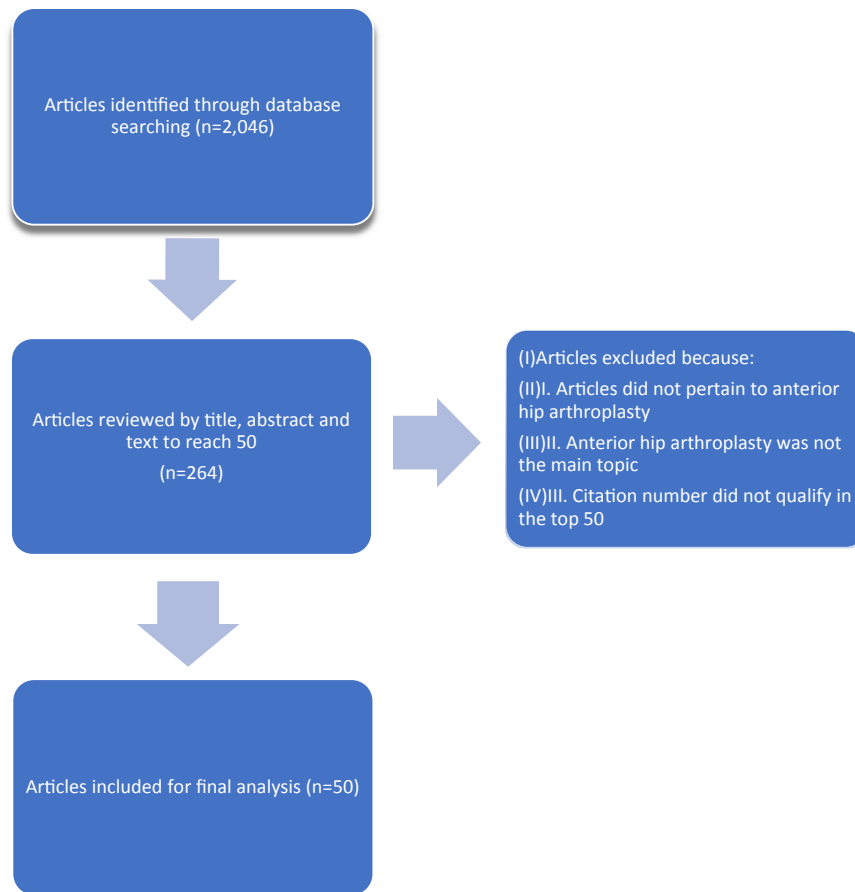


Figure 1. Modified PRISMA flow chart. This flowchart demonstrates the selection process in identifying the 50 most cited articles regarding Direct Anterior Approach for Total Hip Arthroplasty. The initial search resulted in 2046 articles. Of these articles, the top 50 most cited relevant articles were identified within the first 264 search results. The remainder of the articles were excluded.

A gap exists in the citation analysis literature with regard to the topic of DAA hip arthroplasty. As such, the purpose of this study is 2-fold. The first objective is to identify the 50 most influential publications, as measured by citation frequency, pertaining to DAA hip arthroplasty. The second objective is to compile a list of publications that functions as a guide for members of the orthopaedic community to use for knowledge base development and for advancing research in the field.

Methods

Given the publicly available nature of the data used in this study, institutional review board approval was not required. The Clarivate Analytics Web of Knowledge database was utilized to gather publications for inclusion in this cross-sectional study. On July 10th, 2019, the following Boolean search phrase was used to query the Web of Knowledge database and gather publications for analysis: “(Anterior OR Direct Anterior OR Smith-Peterson OR Smith-Petersen) AND (Hip Arthroplasty OR Hip Replacement)”. No restrictions were placed on this search query across any categories including but not limited to language, journal, date of publication, or origin of publication. The search results were sorted by total number of citations in descending order. Titles and abstracts of these studies were then reviewed to determine which papers did not directly and exclusively relate to DAA hip arthroplasty. Subsequently, papers in which DAA for hip arthroplasty was not the primary topic were excluded from the analysis. Studies on indications, procedural

descriptions, outcomes, and complications for DAA hip arthroplasty were included in our analysis. For studies with ambiguous inclusion or exclusion status after title and abstract review, the full article was obtained and reviewed by 2 of the authors, a senior orthopaedic resident and the senior author, a joint reconstruction specialist, to determine if it met the inclusion criteria.

The top 50 most cited articles meeting the inclusion criteria were recorded and reviewed for author, year of publication, publishing journal, country of origin, citations each year since

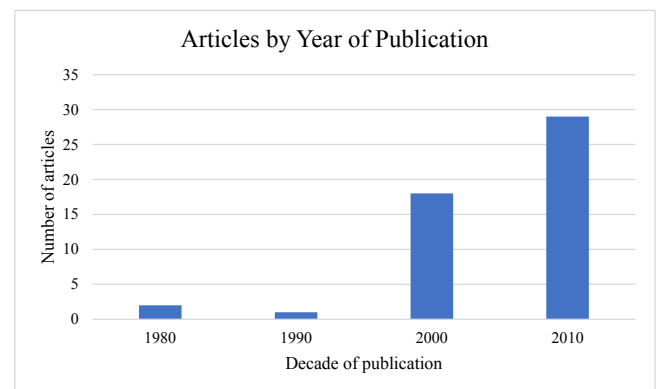


Figure 2. Total number of articles published per year. This demonstrates that most articles identified in the study have been published after 2009, with 2000–2009 being the second most productive period.

Table 1
Top 50 most cited DAA total hip arthroplasty articles.

Rank	Article	No. of citations (citation density)	Level of evidence
1	Matta JM, Shahrdrar C, Ferguson T. Single-incision anterior approach for total hip arthroplasty on an orthopaedic table. <i>Clin Orthop Relat Res.</i> 2005; 441:115–24.	253 (18.1)	IV
2	Kennon RE, Keggi JM, Wetmore RS, Zatorski LE, Huo MH, Keggi KJ. Total hip arthroplasty through a minimally invasive anterior surgical approach. <i>J Bone Joint Surg Am.</i> 2003; 85-A Suppl 4:39–48.	214 (13.4)	NA
3	Siguier T, Siguier M, Brumpt B. Mini-incision anterior approach does not increase dislocation rate: a study of 1037 total hip replacements. <i>Clin Orthop Relat Res.</i> 2004; (426):164–73.	174 (11.6)	III
4	Barrett WP, Turner SE, Leopold JP. Prospective randomized study of direct anterior vs postero-lateral approach for total hip arthroplasty. <i>J Arthroplasty.</i> 2013; 28(9):1634–8.	122 (20.3)	I
5	Bergin PF, Doppelt JD, Kephart CJ, et al. Comparison of minimally invasive direct anterior vs posterior total hip arthroplasty based on inflammation and muscle damage markers. <i>J Bone Joint Surg Am.</i> 2011; 93(15):1392–8.	121 (15.1)	II
6	Meneghini RM, Pagnano MW, Trousdale RT, Hozack WJ. Muscle damage during MIS total hip arthroplasty: Smith-Petersen vs posterior approach. <i>Clin Orthop Relat Res.</i> 2006; 453:293–8.	112 (8.6)	NA
7	Jewett BA, Collis DK. High complication rate with anterior total hip arthroplasties on a fracture table. <i>Clin Orthop Relat Res.</i> 2011; 469(2):503–7.	105 (13.1)	IV
8	Nakata K, Nishikawa M, Yamamoto K, Hirota S, Yoshikawa H. A clinical comparative study of the direct anterior with mini-posterior approach: 2 consecutive series. <i>J Arthroplasty.</i> 2009; 24(5):698–704.	100 (10)	IV
9	Restrepo C, Parvizi J, Pour AE, Hozack WJ. Prospective randomized study of 2 surgical approaches for total hip arthroplasty. <i>J Arthroplasty.</i> 2010; 25(5):671–9.e1.	97 (10.8)	I
10	Mayr E, Nogler M, Benedetti MG, et al. A prospective randomized assessment of earlier functional recovery in THA patients treated by minimally invasive direct anterior approach: a gait analysis study. <i>Clin Biomech (Bristol, Avon).</i> 2009; 24(10):812–8.	95 (9.5)	I
11	Woolson ST, Poulriot MA, Huddleston JI. Primary total hip arthroplasty using an anterior approach and a fracture table: short-term results from a community hospital. <i>J Arthroplasty.</i> 2009; 24(7):999–1005.	92 (9.2)	IV
12	Spaans AJ, Van den hout JA, Bolder SB. High complication rate in the early experience of minimally invasive total hip arthroplasty by the direct anterior approach. <i>Acta Orthop.</i> 2012; 83(4):342–6.	83 (11.9)	II
13	Light TR, Keggi KJ. Anterior approach to hip arthroplasty. <i>Clin Orthop Relat Res.</i> 1980; (152):255–60.	80 (2.1)	NA
14	Goulding K, Beaulé PE, Kim PR, Fazekas A. Incidence of lateral femoral cutaneous nerve neuropraxia after anterior approach hip arthroplasty. <i>Clin Orthop Relat Res.</i> 2010; 468(9):2397–404.	77 (8.6)	III
15	Bhandari M, Matta JM, Dodgin D, et al. Outcomes following the single-incision anterior approach to total hip arthroplasty: a multicenter observational study. <i>Orthop Clin North Am.</i> 2009; 40(3):329–42.	76 (7.6)	IV
16	Berend KR, Lombardi AV, Seng BE, Adams JB. Enhanced early outcomes with the anterior supine intermuscular approach in primary total hip arthroplasty. <i>J Bone Joint Surg Am.</i> 2009; 91 Suppl 6:107–20.	75 (7.5)	III
17	Seng BE, Berend KR, Ajluni AF, Lombardi AV. Anterior-supine minimally invasive total hip arthroplasty: defining the learning curve. <i>Orthop Clin North Am.</i> 2009; 40(3):343–50.	75 (7.5)	NA
18	Goebel S, Steinert AF, Schillinger J, et al. Reduced postoperative pain in total hip arthroplasty after minimal-invasive anterior approach. <i>Int Orthop.</i> 2012; 36(3):491–8.	68 (9.7)	III
19	Rodriguez JA, Deshmukh AJ, Rathod PA, et al. Does the direct anterior approach in THA offer faster rehabilitation and comparable safety to the posterior approach?. <i>Clin Orthop Relat Res.</i> 2014; 472(2):455–63.	65 (8.1)	II
20	Bremer AK, Kalberer F, Pfirrmann CW, Dora C. Soft-tissue changes in hip abductor muscles and tendons after total hip replacement: comparison between the direct anterior and the transgluteal approaches. <i>J Bone Joint Surg Br.</i> 2011; 93(7):886–9.	65 (13)	III
21	Sariali E, Leonard P, Mamoudy P. Dislocation after total hip arthroplasty using Hueter anterior approach. <i>J Arthroplasty.</i> 2008; 23(2):266–72.	65 (5.9)	II
22	Higgins BT, Barlow DR, Heagerty NE, Lin TJ. Anterior vs posterior approach for total hip arthroplasty, a systematic review and meta-analysis. <i>J Arthroplasty.</i> 2015; 30(3):419–34.	63 (15.8)	I
23	Poehling-monaghan KL, Kamath AF, Taunton MJ, Pagnano MW. Direct anterior vs minimiposterior THA with the same advanced perioperative protocols: surprising early clinical results. <i>Clin Orthop Relat Res.</i> 2015; 473(2):623–31.	59 (14.8)	III
24	Christensen CP, Karthikeyan T, Jacobs CA. Greater prevalence of wound complications requiring reoperation with direct anterior approach total hip arthroplasty. <i>J Arthroplasty.</i> 2014; 29(9):1839–41.	57 (11.4)	III
25	Kennon R, Keggi J, Zatorski LE, Keggi KJ. Anterior approach for total hip arthroplasty: beyond the minimally invasive technique. <i>J Bone Joint Surg Am.</i> 2004;86-A Suppl 2:91–7.	55 (3.7)	IV
26	Lovell TP. Single-incision direct anterior approach for total hip arthroplasty using a standard operating table. <i>J Arthroplasty.</i> 2008; 23(7 Suppl):64–8.	54 (4.9)	NA
27	Taunton MJ, Mason JB, Odum SM, Springer BD. Direct anterior total hip arthroplasty yields more rapid voluntary cessation of all walking aids: a prospective, randomized clinical trial. <i>J Arthroplasty.</i> 2014; 29(9 Suppl):169–72.	52 (10.4)	I
28	Zawadsky MW, Paulus MC, Murray PJ, Johansen MA. Early outcome comparison between the direct anterior approach and the mini-incision posterior approach for primary total hip arthroplasty: 150 consecutive cases. <i>J Arthroplasty.</i> 2014; 29(6):1256–60.	52 (10.4)	III
29	Petis S, Howard JL, Lanting BL, Vasarhelyi EM. Surgical approach in primary total hip arthroplasty: anatomy, technique and clinical outcomes. <i>Can J Surg.</i> 2015; 58(2):128–39.	51 (12.8)	NA
30	De steiger RN, Lorimer M, Solomon M. What is the learning curve for the anterior approach for total hip arthroplasty?. <i>Clin Orthop Relat Res.</i> 2015; 473(12):3860–6.	48 (12)	III
31	Post ZD, Orozco F, Diaz-ledezma C, Hozack WJ, Ong A. Direct anterior approach for total hip arthroplasty: indications, technique, and results. <i>J Am Acad Orthop Surg.</i> 2014; 22(9):595–603.	48 (8)	NA
32		48 (9.6)	III

Table 1 (continued)

Rank	Article	No. of citations (citation density)	Level of evidence
	Martin CT, Pugely AJ, Gao Y, Clark CR. A comparison of hospital length of stay and short-term morbidity between the anterior and the posterior approaches to total hip arthroplasty. <i>J Arthroplasty</i> . 2013; 28(5):849-54.		
33	De geest T, Vansintjan P, De loore G. Direct anterior total hip arthroplasty: complications and early outcome in a series of 300 cases. <i>Acta Orthop Belg</i> . 2013; 79(2):166-73.	46 (4.6)	IV
34	Bender B, Nogler M, Hozack WJ. Direct anterior approach for total hip arthroplasty. <i>Orthop Clin North Am</i> . 2009; 40(3):321-8.	46 (7.7)	NA
35	Klausmeier V, Lugade V, Jewett BA, Collis DK, Chou LS. Is there faster recovery with an anterior or anterolateral THA? A pilot study. <i>Clin Orthop Relat Res</i> . 2010; 468(2):533-41.	45 (4.5)	II
36	Barton C, Kim PR. Complications of the direct anterior approach for total hip arthroplasty. <i>Orthop Clin North Am</i> . 2009; 40(3):371-5.	45 (5)	NA
37	Fleischman AN, Rothman RH, Parvizi J. Femoral Nerve Palsy Following Total Hip Arthroplasty: Incidence and Course of Recovery. <i>J Arthroplasty</i> . 2018; 33(4):1194-1199.	43 (43)	III
38	Restrepo C, Mortazavi SM, Brothers J, Parvizi J, Rothman RH. Hip dislocation: are hip precautions necessary in anterior approaches?. <i>Clin Orthop Relat Res</i> . 2011; 469(2):417-22.	43 (4.8)	IV
39	Lugade V, Wu A, Jewett B, Collis D, Chou LS. Gait asymmetry following an anterior and anterolateral approach to total hip arthroplasty. <i>Clin Biomech (Bristol, Avon)</i> . 2010; 25(7):675-80.	43 (5.4)	II
40	Rathod PA, Bhalla S, Deshmukh AJ, Rodriguez JA. Does fluoroscopy with anterior hip arthroplasty decrease acetabular cup variability compared with a nonguided posterior approach?. <i>Clin Orthop Relat Res</i> . 2014; 472(6):1877-85.	42 (8.4)	III
41	Chechik O, Khashan M, Lador R, Salai M, Amar E. Surgical approach and prosthesis fixation in hip arthroplasty world wide. <i>Arch Orthop Trauma Surg</i> . 2013; 133(11):1595-600.	41 (6.8)	NA
42	Keggi KJ, Huo MH, Zatorski LE. Anterior approach to total hip replacement: surgical technique and clinical results of our first one thousand cases using non-cemented prostheses. <i>Yale J Biol Med</i> . 1993; 66(3):243-56.	41 (1.6)	NA
43	Maffioletti NA, Impellizzeri FM, Widler K, et al. Spatiotemporal parameters of gait after total hip replacement: anterior vs posterior approach. <i>Orthop Clin North Am</i> . 2009; 40(3):407-15.	40 (4)	IV
44	Hallert O, Li Y, Brismar H, Lindgren U. The direct anterior approach: initial experience of a minimally invasive technique for total hip arthroplasty. <i>J Orthop Surg Res</i> . 2012; 7:17.	39 (5.6)	IV
45	Judet J, Judet H. [Anterior approach in total hip arthroplasty]. <i>Presse Med</i> . 1985; 14(18):1031-3.	38 (1.1)	NA
46	Sheth D, Cafri G, Inacio MC, Paxton EW, Namba RS. Anterior and Anterolateral Approaches for THA Are Associated With Lower Dislocation Risk Without Higher Revision Risk. <i>Clin Orthop Relat Res</i> . 2015; 473(11):3401-8.	35 (2.7)	III
47	Nogler M, Krismer M, Hozack WJ, Merritt P, Rachbauer F, Mayr E. A double offset broach handle for preparation of the femoral cavity in minimally invasive direct anterior total hip arthroplasty. <i>J Arthroplasty</i> . 2006; 21(8):1206-8.	35 (8.8)	NA
48	Matta JM, Shahrdar C, Ferguson T. Single-incision anterior approach for total hip arthroplasty on an orthopaedic table. <i>Clin Orthop Relat Res</i> . 2005; 441:115-24.	34 (8.5)	I
49	Ropars M, Morandi X, Hutten D, Thomazeau H, Berton E, Darnault P. Anatomical study of the lateral femoral cutaneous nerve with special reference to minimally invasive anterior approach for total hip replacement. <i>Surg Radiol Anat</i> . 2009; 31(3):199-204.	33 (3.3)	NA
50	Rathod PA, Orishimo KF, Kremenic IJ, Deshmukh AJ, Rodriguez JA. Similar improvement in gait parameters following direct anterior & posterior approach total hip arthroplasty. <i>J Arthroplasty</i> . 2014; 29(6):1261-4.	31 (6.2)	II

publication, type of study (randomized control trial, cohort study, case-control, case series, case report, systematic review article, expert opinion), and level of evidence for clinical articles as determined by The Journal of Bone and Joint Surgery guidelines [26]. As per Journal of Bone and Joint Surgery guidelines, the level of evidence of systematic reviews was determined by the level of evidence of the articles analyzed. Articles that reviewed the literature in a nonsystematic fashion or were descriptive in nature were coded as expert opinion publications. Citation density, defined as number of citations per year, was also recorded for each article.

Results

The primary search query yielded a total of 2046 results. The top 264 most cited results were reviewed to determine the top 50 publications on the subject of DAA hip arthroplasty (Fig. 1). The top 50 publications included articles published between the years of 1980 and 2017, with a median publication year of 2011. 47 of the 50 articles were published since the year 2000, and 39 of the articles were published since 2009 (Fig. 2). The year with the most publications was 2009, which included 10 of the top 50 articles. Analysis of the number of total citations per year revealed that 2018 had the most with 680. This was followed by the years 2017 and 2016 with

607 and 563 citations, respectively. The total number of citations attributed to the top 50 articles was 3,521, with an average of 86.3 total citations per year between 1980 and 2019. The total number of citations for each paper ranged from 31 to 253 citations at the time of data collection, with an average number of 70.4 citations per paper.

The citation density, or the average number of citations per year since the date of publication, was also analyzed for each of the top 50 articles (Table 1). Fleischman et al. (43.0 citations/year), Barrett et al. (20.3 citations/year), and Matta et al. (18.1 citations/year) were the top 3 articles by citation density. The oldest article, Light et al., ranked the 13th in total citations (80) and 48th in citation density (2.1 citations/year).

Examination of the selected articles by study design revealed that cohort studies were the most common, composing 22 of the 50 publications. Cohort study design was followed in frequency by descriptive studies (9), case series (7), and randomized controlled trials (5) (Table 2). Level of evidence is closely related to study design. Analysis of level of evidence among the top 50 most cited publications revealed level III studies to be the most prevalent with 15 papers (Fig. 3). This was followed by level IV studies (11), level I studies (5), and level II studies (7). There were no level V studies included in this analysis. The level of evidence was not applicable to 13 articles because they were classified as expert opinion.

Table 2
Articles classified by study type.

Study type	No. of articles
Randomized controlled trial	5
Nonrandomized controlled trial	0
Cohort study	22
Case-control study	1
Case series	7
Case report	0
Review article	3
Descriptive	10
Cadaver	2

Table 3
Journal of origin.

Journal of origin	No. of articles
<i>Journal of Arthroplasty</i>	15
<i>Clinical Orthopaedics and Related Research</i>	13
<i>Orthopedic Clinics of North America</i>	6
<i>Journal of Bone and Joint Surgery</i>	5
<i>Clinical Biomechanics</i>	2
<i>Journal of the American Academy of Orthopaedic Surgeons</i>	1
<i>International Orthopaedics</i>	1
<i>Canadian Journal of Surgery</i>	1
<i>Journal of Orthopaedic Surgery and Research</i>	1
<i>Presse Medicale</i>	1
<i>Yale Journal of Biology and Medicine</i>	1
<i>Acta Orthopaedica Belgica</i>	1
<i>Archive of orthopaedic and trauma surgery</i>	1
<i>Surgical and Radiologic Anatomy</i>	1

The top 50 articles were published in 15 different journals. *Journal of Arthroplasty* was the most prolific journal on the topic of DAA hip arthroplasty with 15 publications (Table 3). This was followed by *Clinical Orthopaedics and Related Research* with 13 publications, and *Orthopedic Clinics of North America* ranked third with 6 publications. The 50 publications examined in this study originated from 14 different countries (Fig. 4). The top 2 most represented countries of origin were the United States (33) and Canada (4). Austria, Switzerland, and France tied for third with 3 studies each. Four of the top 50 studies listed multiple countries of origin.

Discussion

The frequency of citations for any individual article is a valuable measure of the overall impact of that article. Citation analysis is an objective metric for assessing the influence of a publication, and this methodology has been applied broadly in orthopaedics and other specialties [15,16,19]. A particular study may amass a high citation count for a number of reasons, including guidance of clinical practice, quality of the study, or the foundational nature of the work in a particular field. Our analysis revealed a notable trend toward more recent publication among the 50 most influential articles. The most common year of publication was 2009, and more than half of the included articles were published since 2010. This finding contrasts with other citation analysis studies in orthopaedics, which have found that older publications tend to have the greatest number of citations [24,27]. Although DAA hip arthroplasty has been used in clinical practice since the first half of the 20th century, this topic has just recently risen in prominence [9–11]. This likely explains the trend toward more recent studies among influential publications on this topic. In ascending order, the years 2016, 2017, and 2018 had the most total citations across

all articles examined in this study. Interest in the topic of DAA hip arthroplasty appears to be increasing based on this positive trend in the total number of citations each year.

Apart from publication year, total number of citations was influenced by several other characteristics. We found that the most common location of origin for highly cited studies was the United States (33), which is consistent with several previous studies of orthopaedics topics [20–22,24,28]. This does not come as a surprise, as the United States is the most prolific country in medical research by a significant margin [29]. The most common journals of publication were *Journal of Arthroplasty* and *Clinical Orthopaedics and Related Research*, publishing 15 papers and 13 papers, respectively. Both of these are consistently among the highest impact journals in orthopaedics, so it follows that influential articles should often come from these journals [30].

This study differed from prior citation analyses in orthopaedic literature, in which level III evidence was the most commonly represented level of evidence. Furthermore, this research included 32.4% (12/37) level I and II studies. Many prior citation analyses have found that levels IV and V are most common and have found a much smaller percentage of level I and II studies among highly cited papers [17,18,20,22,24,27,31]. This is particularly interesting when considered in conjunction with the recency of the most highly cited papers. It appears DAA hip arthroplasty may be enjoying influence from a recent wave of higher quality research compared with other topics in orthopaedics. One other factor that that should not be ignored in recognizing this pattern is that this study focuses on a single approach for a specific procedure, whereas other citation analyses tend to focus on broader topics. It may be useful for further

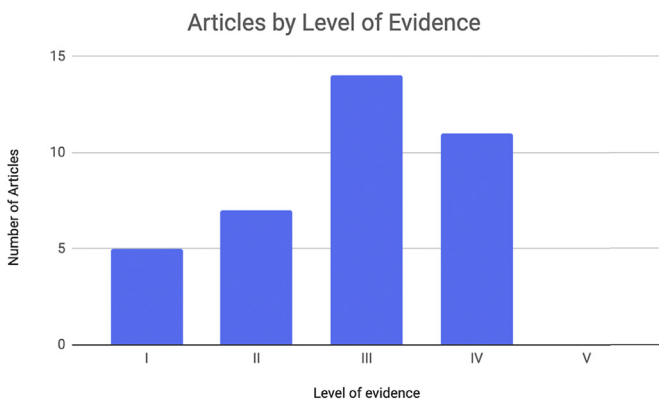


Figure 3. Total number of articles by level of evidence. Most citations included in the study were found to be level III and IV evidence based, with 5 level I and 7 level II articles included.

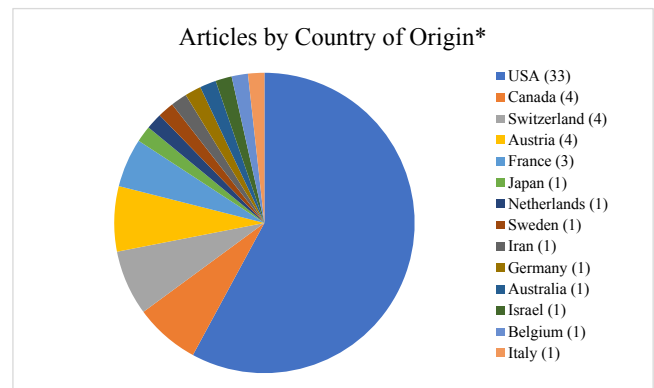


Figure 4. 33 of the 50 articles identified were conducted in the United States of America, followed by Canada (4) and Switzerland (4), Austria (4), and France (3; each with 3 publications). *Totals 57 as a result of articles having multiple countries of origin.

studies on the topic of citation analysis to look into the relationship between the breadth of the topic and levels of evidence found in the most cited studies.

This citation analysis is subject to several limitations. Some of these are inherent to the study design. Using citation analysis as a proxy for impact is limited by the “snowball effect”, which states scientific authors are likely to cite an article due to its previous citations rather than the merit of the article itself [24,31]. In addition, citation count is limited as a proxy for influence in a field because responding to a controversial article requires a citation [17]. This may inflate citation counts for articles that do not positively influence a field of study and reduce the strength of citation count as a metric for influence. Other limitations are specific to this study. First, the analysis herein did not account for self-cited works, which may inflate representation of high-volume authors. Second, we did not account for bias that may arise from authors citing from the journals where they are attempting to publish. Third, there may be limitations inherent to the Web of Knowledge database that led to the exclusion of highly influential publications from this analysis. This work also excluded presentations, textbooks, and lectures that may be highly influential in DAA hip arthroplasty. Finally, this is a cross-sectional study, which limits the results of this study to describing a single point in time. Despite these limitations, this study still successfully spotlights influential papers on the topic of DAA hip arthroplasty.

Conclusion

This analysis provides insight into factors that characterize highly cited articles on the specific topic of DAA hip arthroplasty. These factors include higher levels of evidence, recent publication, and origin in the United States. Citations of DAA hip arthroplasty papers appear to be on the rise. The curation and analysis of this set of 50 articles will provide orthopaedic providers, researchers, and residency program directors a guide for quickly isolating influential articles on the topic of DAA hip arthroplasty. This may serve as a quick reference for clinical decision-making, foundation for further research, and curriculum on DAA hip arthroplasty.

Conflict of interest

The authors declare there are no conflicts of interest.

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