

Research Article

TOP 50 ARTICLES ON DISCOID MENISCUS MANAGEMENT BIBLIOMETRIC ANALYSIS
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ABSTRACT**Objective:**

This study aims to determine the scientific evolution, global trends, and research focus in the field by analyzing the top 50 articles with the highest impact in the discoid lateral meniscus (DLM) literature using bibliometric methods.

Methods:

In March 2025, the Web of Science Core Collection database was searched using the following query: (“discoid meniscus” OR “discoid lateral meniscus”) AND meniscus. The articles were ranked by the number of citations, and the 50 studies with the highest number of citations related to the diagnosis, treatment, or prognosis of the discoid lateral meniscus were included in the study. The articles were analyzed quantitatively in terms of publication year, journal, author, country, number of citations, study design, and level of evidence; and qualitatively in terms of research focus and methodological characteristics. Bibliometric visualization was performed using the VOSviewer software.

Results:

The 50 articles reviewed were published between 1981 and 2022, with an average citation count of 103.5 per article. The United States (n=27) maintained its global leadership in terms of the highest number of publications and citations, while South Korea and Japan demonstrated a strong academic impact reflecting East Asia's clinical experience. Arthroscopy (n=8) was identified as the most productive journal. At the individual level, Hashimoto Y. and Nakamura H. stand out with their studies (1). Level IV studies accounted for the majority (50%) of the publications; however, the proportion of higher-level evidence studies (Levels I-II) has been steadily increasing in recent years

Conclusion:

The DLM literature has shown significant progress from case series to evidence-based surgical algorithms. Current research focuses on surgical techniques and postoperative complications (such as OCD development), but biomechanical and basic science studies remain insufficient. This bibliometric study identifies the main research trends in the literature on the discoid meniscus and highlights potential gaps in this field.

Doi:<https://doi.org/10.5281/zenodo.19067033>**Introduction**

The most common congenital variant of the lateral meniscus, the discoid lateral meniscus (DLM), was first reported by Young (1889). Although the true incidence of this clinical picture is unknown because DLM can be asymptomatic, studies indicate that the prevalence of this variation in the symptomatic population ranges from 0.4% to 17% (Rohren et al., 2001; Yaniv & Blumberg, 2007; Sabbag et al., 2018). The reported prevalence of discoid lateral meniscus varies widely in the literature. This variation may be related to differences in population characteristics, the use of imaging methods, and the inclusion of asymptomatic individuals in epidemiological studies. Grimm et al. (2020), in their study examining a large regional health database, determined the overall prevalence to be 4.88 per 100,000 patients. The same study reported that the highest prevalence was among individuals of Hispanic origin (6.01/100,000), the lowest prevalence was among the Black population (2.68/100,000), and among individuals of Asian origin, this rate was 4.38/100,000.

Clinically, pain, effusion, clicking sound, popping or giving way sensation, joint movement restriction, quadriceps atrophy, and locking are the most common symptoms (Patel et al., 2018). However, the clinical picture and physical examination findings may not always accurately predict the meniscus's morphology or the presence of an accompanying tear (Hampton et

al., 2021), and this situation necessitates evaluation using advanced imaging techniques. Magnetic resonance imaging (MRI) is the primary non-invasive imaging method used in clinical practice; however, arthroscopy is still considered the gold standard for the definitive diagnosis and morphological assessment of a discoid meniscus (Siow & Ganley, 2011; Jordan, 1996). In addition to the traditional Watanabe et al. (1969) classification system, the arthroscopic PRISM classification system, which has gained popularity in recent years, is also used (Lee et al., 2024). In light of current literature, conservative monitoring is recommended in asymptomatic cases (Sohn et al., 2018), while surgical options such as arthroscopy and meniscus repair are preferred in symptomatic patients (Pace et al., 2021).

Despite the increase in the number of publications on the lateral meniscus, there are insufficient studies that comprehensively analyze the global trends, bibliometric characteristics, and knowledge gaps in scientific production in this field. Bibliometric analyses can help identify prominent research topics in the literature, pinpoint the most influential publications, and provide insights into future research directions. In recent years, bibliometric analyses have become increasingly common in orthopedic research to assess publication trends, scientific productivity, and impactful studies in specific fields.

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However, to the best of our knowledge, a comprehensive bibliometric evaluation focusing specifically on the literature regarding the discoid lateral meniscus has not yet been conducted. This study aims to provide a quantitative overview of the historical development of research on the discoid meniscus by analyzing the 50 most-cited articles in the literature.

Methods

In March 2025, the Web of Science Core Collection database was searched using the following Boolean query: (“discoid meniscus” OR “discoid lateral meniscus”) AND meniscus. The Web of Science Core Collection was selected because it is one of the most widely used databases for bibliometric research and provides reliable citation indexing. To narrow down the results, the “Core Collection” was filtered according to relevant subject categories, including orthopedics, surgery, and radiology/nuclear medicine/medical imaging. Studies on the diagnosis and treatment of discoid meniscus were included. Articles were ranked in descending order based on citation counts, and in cases of equal citation counts, priority was given to the article published more recently. From this sequential list, the 50 most frequently cited studies addressing the diagnosis, treatment, or prognosis of discoid meniscus were selected (Kumar et al., 2023; Dünki, 2025). Headings and summaries were scanned. Full texts were examined when necessary to verify the level of relevance. Exclusion criteria included animal studies, case reports, publications containing only abstracts, letters, editorials, and articles unrelated to discoid meniscus treatment.

The latest dataset was analyzed in terms of various bibliometric variables, including contributing journals, the author’s country, year of publication, total citations, and citation trends over time. A qualitative classification of the selected studies was also performed. Articles were grouped as clinical or basic science depending on whether they included patients or laboratory-based research. Clinical studies were further subdivided into therapeutic, prognostic, and diagnostic categories based on primary research objectives and outcome measures. Therapeutic studies evaluated treatment methods, prognostic studies examined results related to prognosis, and diagnostic studies evaluated tests or imaging methods. Basic science studies were divided into anatomical, experimental/biomechanical, and radiological subgroups.

The level of evidence for each clinical study was determined using the Journal of Bone and Joint Surgery (JBJS) orthopedic ranking system. In addition, a qualitative synthesis of the studies included for discussion purposes was performed. Finally, bibliometric mapping was performed using VOSviewer software (<https://app.vosviewer.com/>) to create visualization maps highlighting recurring themes in the titles and abstracts of the selected articles.

Results

The search strategy initially yielded 745 articles (Figure 1). Following the screening, seven articles were excluded in descending order of citations to create the final list of the 50 most cited studies. These excluded publications were not related to discoid meniscus. They focused on degenerative meniscus tears (n = 3), meniscus displacement disorders (n = 2), and multiple ligament tears (n = 2). The included articles were published in 30 journals between 1981 and 2022 and were authored by 194 different researchers. The citation counts for the selected studies ranged from 62 to 316, with an average of 103.5 citations per article. The top 10 most cited publications received a total of 1,680 citations (16-24). (Table 1). Arthroscopy – The Journal of Arthroscopy and Related Surgery contributed the highest number of articles (n = 8). Following this, the “American Journal of Sports Medicine” and the “Journal of Bone and Joint Surgery American Volume” each contributed 5 articles.

Geographically, the United States produced the largest share of both publications (n = 27) and citations (n = 3,045) (Figures 2–3). South Korea had 701 citations in eight articles. Seven articles published from Japan received 731 citations. When looking at citations per article, the United States was again in first place (n = 112.7).

Of the 50 most cited publications, 38 were original research articles and 12 were review articles. Among the research articles, 37 were clinical studies and one was a basic science study. The levels of evidence for the clinical studies were distributed as follows: two articles were level I, four studies were level II, six studies were level III, and 25 studies were level IV. Level I evidence corresponds to randomized controlled trials, level II to prospective cohort studies with control groups, level III to retrospective case-control analyses, and level IV to case series. Review articles consisted of narrative reviews categorized as providing level V evidence.

Figure 1. Flowchart of the literature search and study selection process for the top 50 most-cites articles

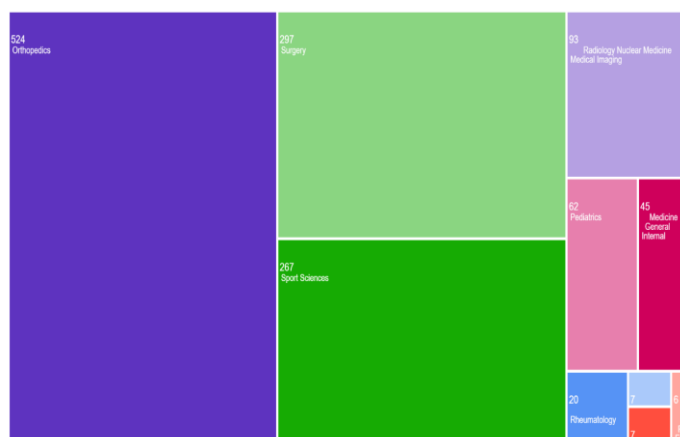


Figure 2. Distribution of the 50 most-cited articles by country of origin

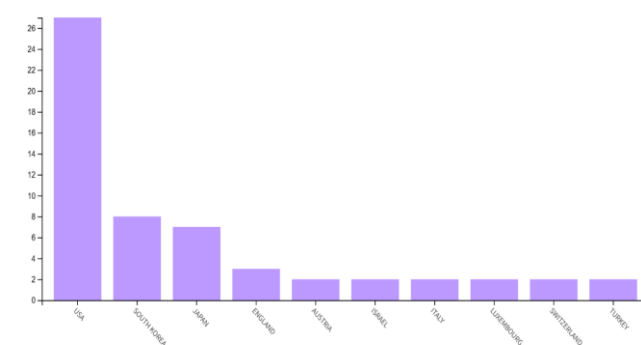


Figure 3. Annual distribution of publications and citation trends in discoid lateral meniscus research (1981-2022)

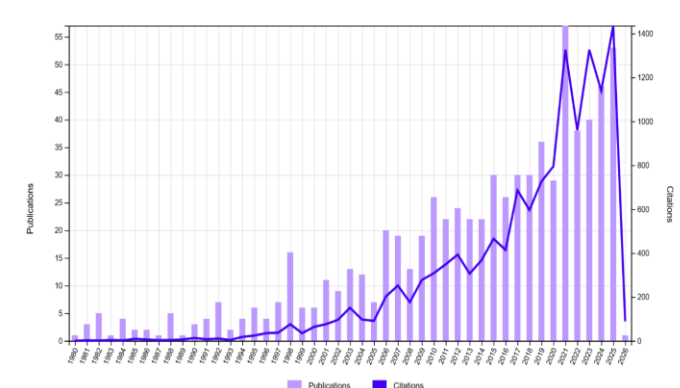


Table 1. List of the top 10 most-cited publications on discoid lateral meniscus.

	Study	Citation	Citation/Year
1	Clark CR, Ogden JA. Development of the menisci of the human knee joint. Morphological changes and their potential role in childhood meniscal injury. <i>J Bone Joint Surg Am.</i> 1983;65(4):538-547.	316	7,3
2	Lee YS, Teo SH, Ahn JH, Lee OS, Lee SH, Lee JH. Systematic Review of the Long-term Surgical Outcomes of Discoid Lateral Meniscus. <i>Arthroscopy.</i> 2017;33(10):1884-1895. doi:10.1016/j.arthro.2017.04.006	201	22,3
3	Rath E, Richmond JC. The menisci: basic science and advances in treatment. <i>Br J Sports Med.</i> 2000;34(4):252-257. doi:10.1136/bjsm.34.4.252	161	10,1
4	Dickhaut SC, DeLee JC. The discoid lateral-meniscus syndrome. <i>J Bone Joint Surg Am.</i> 1982;64(7):1068-1073.	151	3,4
5	Räber DA, Friederich NF, Hefti F. Discoid lateral meniscus in children. Long-term follow-up after total meniscectomy. <i>J Bone Joint Surg Am.</i> 1998;80(11):1579-1586. doi:10.2106/00004623-199811000-00003	150	8,3
6	Nguyen JC, De Smet AA, Graf BK, Rosas HG. MR imaging-based diagnosis and classification of meniscal tears. <i>Radiographics.</i> 2014;34(4):981-999. doi:10.1148/rg.344125202	147	12,2
7	Lee DH, Lee BS, Kim JM, et al. Predictors of degenerative medial meniscus extrusion: radial component and knee osteoarthritis. <i>Knee Surg Sports Traumatol Arthrosc.</i> 2011;19(2):222-229. doi:10.1007/s00167-010-1274-2	147	9,8
8	Kocher MS, DiCanzio J, Zurakowski D, Micheli LJ. Diagnostic performance of clinical examination and selective magnetic resonance imaging in the evaluation of intraarticular knee disorders in children and adolescents. <i>Am J Sports Med.</i> 2001;29(3):292-296. doi:10.1177/03635465010290030601	143	9,5
9	Silverman JM, Mink JH, Deutsch AL. Discoid menisci of the knee: MR imaging appearance. <i>Radiology.</i> 1989;173(2):351-354. doi:10.1148/radiology.173.2.2798867	135	5,4
10	Aichroth PM, Patel DV, Marx CL. Congenital discoid lateral meniscus in children. A follow-up study and evolution of management. <i>J Bone Joint Surg Br.</i> 1991;73(6):932-936. doi:10.1302/0301-620X.73B6.1955439	129	3,6

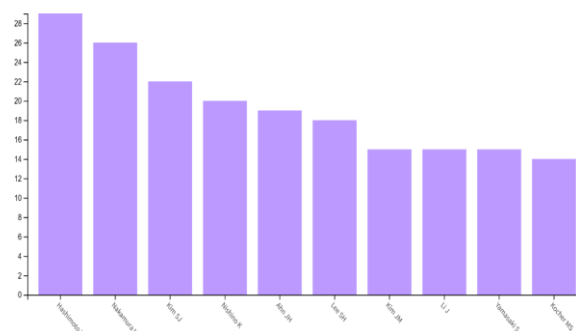
Discussion

This bibliometric analysis reveals that the discoid meniscus literature has demonstrated remarkable momentum in terms of both annual publication numbers and cumulative citation rates. This significant increase in citation numbers, in particular, is a concrete indication that the information produced has found strong resonance in the literature and has become a fundamental reference source for researchers. This trend may reflect the growing academic interest in diagnostic and surgical approaches for discoid meniscus. We believe that this

increasing citation impact contributes to the development of evidence-based knowledge in the management of discoid meniscus, suggesting an increasing convergence of scientific interest within the orthopedic research community.

The geographical analysis results of our study show that the United States continues to be the clear leader in the discoid meniscus literature in terms of both total number of publications and citation rates. This is consistent with the US's global academic funding power and extensive research networks. Another noteworthy finding is that South Korea ranks as the second most prolific country in terms of publications. It is known in the literature that the prevalence of discoid meniscus is higher in East Asian populations; therefore, South Korea's intensive scientific output in this area appears to be directly related to the clinical case diversity and experience in the region. On the other hand, Japan's second place in citation rates proves that Japanese studies carry strong reference value in the literature not only in terms of numbers but also in terms of methodological and clinical depth, and are highly accepted on a global scale. From an individual perspective, Hashimoto Y., one of the leading authors in the literature, has attracted attention with his long-standing work in the field of discoid meniscus (Figure 4).

Figure 4. VOSviewer visualization map of author collaboration networks in the discoid lateral meniscus literature.



The author has thoroughly investigated osteochondritis dissecans (OCD) complications that may develop after discoid meniscus treatment and its risk factors. Over the past six years, this researcher has published nearly thirty articles in this field and made significant contributions to the literature (Nishino et al., 2019; Hashimoto et al., 2020). On the other hand, Nakamura has focused his studies more on morphological changes and radiological evaluations of the knee joint associated with discoid meniscus (Kinoshita et al., 2022).

The results of our study show that the discoid meniscus literature is compiled on a highly qualified and specific academic ground. The fact that the articles examined span a period of more than forty years, from 1981 to the present day, proves that this is a deep-rooted clinical problem that remains relevant today. In particular, the high citation average of 103.5 per article and the cumulative impact of the top 10 most cited publications are concrete evidence that the fundamental studies in this field are accepted as 'citation classics' in the orthopedic community. The fact that the journals with the highest number of publications are the most prestigious publications in the field, such as 'Arthroscopy', 'The American Journal of Sports Medicine' (AJSM), and 'The Journal of Bone and Joint Surgery' (JBJS), reveals that discoid meniscus research has not only increased numerically but has also been discussed at the highest scientific standards and has guided clinical practice. This concentration confirms that the knowledge generated about the surgical treatment and biomechanical properties of the discoid meniscus occupies a central position in the mainstream literature of orthopedic surgery. Similar bibliometric analyses have also been conducted in other areas of orthopedic research, including anterior cruciate ligament reconstruction, rotator cuff tears, and tibial plateau fractures. These studies have

demonstrated the value of bibliometric approaches in identifying influential publications, research trends, and knowledge gaps in the orthopedic literature (Voleti et al., 2015; Namdari et al., 2012; Kumar et al., 2023).

When examining the levels of evidence of the 50 most influential articles in the literature, Level IV studies (case series) are seen to have a clear superiority. This distribution can also be explained by the relatively low prevalence of discoid meniscus and the fact that the patient population consists predominantly of children and adolescents; these factors make it more difficult to design large-scale randomized controlled trials. In clinical conditions with limited population-based incidence and congenital origins, such as discoid meniscus, the difficulties in designing randomized controlled trials (Level I) or large prospective cohorts (Level II) can be considered the main reason for this distribution. Nevertheless, the presence of Level I and II evidence articles among the most cited studies indicates that the literature has evolved towards higher methodological standards in recent years. On the other hand, the fact that 24% of the cited studies are review articles reflects the need to synthesize scattered clinical data on this specific topic with expert opinions. The fact that only one basic science study made it onto the list of most cited studies reveals that researchers have focused more on surgical techniques and clinical outcomes rather than the biomechanical or histopathological origins of the discoid meniscus.

This study has some limitations. First, our analysis is limited to the Web of Science (WoS) database; therefore, some publications included in other indexes such as Scopus or Google Scholar may not have been included in the scope. However, WoS is the most reliable and standard database accepted in the literature for academic citation analysis. Second, some recent publications of high scientific quality may have been ranked lower in the analysis because they have not yet had sufficient time to enter the 'most cited' list. Finally, while bibliometric analyses provide a general perspective on the quality of articles, they do not include a detailed quality assessment (e.g., risk of bias) of the clinical methodology of each study. Furthermore, citation bias, potential self-citation effects, and the advantage that older publications have due to having had more time to accumulate citations should be considered inherent limitations of bibliometric analyses.

Conclusion

In conclusion, this bibliometric analysis demonstrates that the discoid meniscus literature has undergone significant development over the past forty years in terms of both quantity and quality. While the United States maintains its global leadership, the original contributions of East Asian countries play a critical role in shaping the literature. These studies, published in the most prestigious orthopedic journals and receiving high citations, demonstrate that clinical practice has evolved from case series to more advanced surgical techniques and evidence-based algorithms. However, the scarcity of basic science studies and the predominance of low-level evidence studies in the literature are noteworthy. Future research focusing on the biomechanical foundations of the discoid meniscus and high-level evidence from prospective clinical outcomes will open new horizons in the management of this common congenital variation.

Ethical approval

Not applicable (narrative review).

Informed consent

Not applicable.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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