Journal of Dental Sciences and Education

Original Article

DOI: 10.51271/JDSE-0062

A bibliometric analysis of the 100 most cited genioplasty articles (1950-2025)

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Cite this article as: Manav ÖC, Aşkın MB, Kocamaz ÖF, Şengün DN. A bibliometric analysis of the 100 most cited genioplasty articles (1950-2025). *J Dent Sci Educ.* 2025;3(4):89-93.

Received: 27.08.2025 ◆ **Accepted**: 06.10.2025 ◆ **Published**: 26.10.2025

ABSTRACT

Aims: Genioplasty is a widely used surgical technique to correct chin deformities and improve facial harmony. Despite its clinical relevance, a systematic evaluation of influential studies and research trends in this field is lacking. This study aimed to identify and analyze the 100 most cited articles on genioplasty through bibliometric methods.

Methods: A title-specific search using the keyword "genioplasty" was conducted in the Web of Science Core Collection on July 25, 2025, covering the years 1950 to 2025. A total of 403 articles were retrieved and ranked by total citation count. After screening titles and abstracts, the 100 most cited articles with a primary focus on genioplasty were selected by two independent reviewers. Extracted data included publication year, journal name, total citations, average citations per year, authorship, study design, and primary topic. Descriptive statistics were used for analysis.

Results: Citation counts ranged from 13 to 86. Most articles were published after 2000, with a peak in the 2010s. The Journal of Oral and Maxillofacial Surgery (n=20) and Plastic and Reconstructive Surgery (n=13) were the most represented journals. The most common topics were surgical technique (n=45) and outcome evaluation (n=34). Retrospective (n=35) and prospective (n=25) cohort studies dominated, while randomized controlled trials were rare (n=3).

Conclusion: This bibliometric analysis reveals the leading themes, study types, and journals in genioplasty research, offering valuable insight for future investigations in facial skeletal surgery.

Keywords: Genioplasty, chin, maxillofacial surgery, bibliometrics

INTRODUCTION

Facial aesthetics is achieved through a harmonious, proportional, and symmetrical relationship between the facial skeleton and the surrounding soft tissues. In recent years, the growing aesthetic concerns and expectations of individuals have stimulated the development of both functional and cosmetic interventions targeting the facial region.[1] The prominence of the chin plays a critical role in the aesthetic assessment of the facial profile and significantly influences the overall balance and symmetry of the face. In aesthetic perception, the chin structure has historically and culturally been regarded as a symbol of strength and confidence, and is considered one of the facial features that provide insight into an individual's character.[2]

During the clinical evaluation process, measurements related to the chin tip provide critical guidance in determining the appropriate treatment plan. Various techniques have been described in the literature, and with proper patient selection, these methods offer several aesthetic and functional advantages.[3] Genioplasty is one of the commonly used surgical approaches for correcting volume deficiencies and asymmetries of the chin, as well as for masking unaesthetic mandibular relationships.[4]

The increasing number of published articles presents a significant challenge for both researchers and clinicians in identifying studies with the highest quality and greatest clinical impact.[5] Therefore, systematically evaluating the existing literature and providing readers with comprehensive insights through bibliometric analyses has become increasingly important.[6] Bibliometric analyses assess the citation performance, impact, and contributions of scientific publications within a specific field, enabling the identification of influential studies and thematic trends. Analyzing high-impact publications is crucial for understanding developments in the fields of surgery and orthodontics and for identifying pivotal studies that guide future research.[7]

In this study, we aimed to conduct the first comprehensive bibliometric analysis of the literature on genioplasty by evaluating the quality and characteristics of the 100 most cited articles and identifying emerging research trends in the field.

METHODS

A bibliometric analysis was conducted to identify the 100 most cited articles on the topic of genioplasty. On July 25, 2025, the keyword "genioplasty" was used in a title-specific search

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within the Web of Science Core Collection database (Clarivate Analytics, Philadelphia, PA, USA), which is recognized for its comprehensive indexing of high-impact scientific literature. The search was performed without limitations on language or study type and covered all available publication years, from 1950 to 2025.

A total of 403 articles were initially retrieved. These were ranked in descending order based on the total number of citations. To ensure that only relevant articles focusing primarily on genioplasty were included, two independent reviewers (author 1 and 2) screened all titles and abstracts. Publications in which genioplasty was mentioned only peripherally or as an adjunctive procedure were excluded. Any discrepancies during this selection process were resolved through discussion and, when necessary, by consulting a third reviewer (author 3).

The final list comprised the 100 most cited articles directly related to genioplasty. Full texts of the selected articles were accessed, and data were independently extracted by two authors using a standardized Microsoft Excel spreadsheet (version 14.7.7; Microsoft Corp., Redmond, WA, USA). The following variables were recorded: article title, list of authors, year of publication, source journal, total number of citations, average number of citations per year, study design, and main research topic. Categorical data such as study design and thematic focus were classified using predefined criteria based on existing bibliometric literature. All extracted data were cross-checked for consistency and accuracy.

As this study was based solely on published data from the scientific literature, ethical approval was not required. All procedures were carried out in accordance with the ethical rules and the principles.

RESULTS

A comprehensive search conducted in the Web of Science database using the keyword related to genioplasty yielded a total of 403 articles. These articles were ranked according to their citation counts, and the top 100 most cited articles were selected. The included articles and their corresponding citation counts are provided as a supplementary file. The total number of citations among the selected articles ranged from 13 to 86. The most cited article was titled "Vulnerability of the inferior alveolar nerve and mental nerve during genioplasty: an anatomic study", published by Hwang et al.,[8] which received a total of 86 citations and emerged as the most influential publication.

Among the top 100 analyzed articles, the Journal of Oral and Maxillofacial Surgery was the most contributive journal, with 20 publications. This was followed by Plastic and Reconstructive Surgery with 13 articles, and the International Journal of Oral and Maxillofacial Surgery with 10 articles. This finding reflects the significant contribution of these journals to the scientific output in the field of genioplasty (**Table 1**).

When the distribution of publications by decade was examined, the highest number of articles was published in the 2010s, with a total of 33 publications. This was followed by 26 articles in the 2000s and 21 articles in the 1980s. In the 1990s, 13 articles were published, whereas only 7 articles have been published so far in the 2020s (**Table 2**).

When the contribution of countries and their citation counts were evaluated, South Korea had the highest total number of citations, with 8 publications receiving a total of 280 citations (**Table 3**).

Table 1. Journals with the highest number of publications among the top 100 most cited genioplasty articles

Journal	Number of articles
Journal of Oral and Maxillofacial Surgery	20
Plastic and Reconstructive Surgery	13
International Journal of Oral and Maxillofacial Surgery	10
Journal of Cranio-Maxillofacial Surgery	6
Journal of Craniofacial Surgery	5
Oral Surgery Oral Medicine Oral Pathology Oral Radiology and Endodontics	5
British Journal Of Oral & Maxillofacial Surgery	5
Aesthetic Plastic Surgery	5
Journal Of Oral Surgery	4
Oral Surgery Oral Medicine Oral Pathology Oral Radiology and Endodontology	4
Clinics In Plastic Surgery	3
American Journal of Orthodontics and Dentofacial Orthopedics	3
Jama Facial Plastic Surgery	3
Scientific Reports	2
Scandinavian Journal of Plastic and Reconstructive Surgery and Hand Surgery	1
International Journal of Oral Surgery	1
Annals of Plastic Surgery	1
Facial Plastic Surgery	1
Plos One	1
Open Dentistry Journal	1
Laryngoscope	1
Journal of Maxillofacial & Oral Surgery	1
Journal of Stomatology Oral and Maxillofacial Surgery	1
Journal of Plastic Reconstructive and Aesthetic Surgery	1
Facial Plastic Surgery Clinics of North America	1
British Journal of Plastic Surgery	1

Table 2. Distribution of the top-cited genioplasty articles by decade of publication

Decade	Number of articles
1980's	21
1990's	13
2000's	26
2010's	33
2020's	7

Table 3. Top contributing countries in genioplasty research based on citation count and number of articles

Country	Total citations	Number of articles
South Korea	280	8
USA	240	8
Italy	164	5
China	157	6
Germany	90	4

An analysis of the topic distribution of the top 100 most cited genioplasty articles revealed that studies focusing on surgical techniques were the most prevalent, accounting for 45 publications. These were followed by 34 studies centered on outcome evaluation. Other notable topics included prognosis and risk factors (n=7) and anesthesia/analgesia techniques (n=4). The remaining articles addressed less represented themes such as anatomy (n=4), non-operative approaches (n=2), as well as topics related to pathology, psychology, and public health (**Figure 1**).

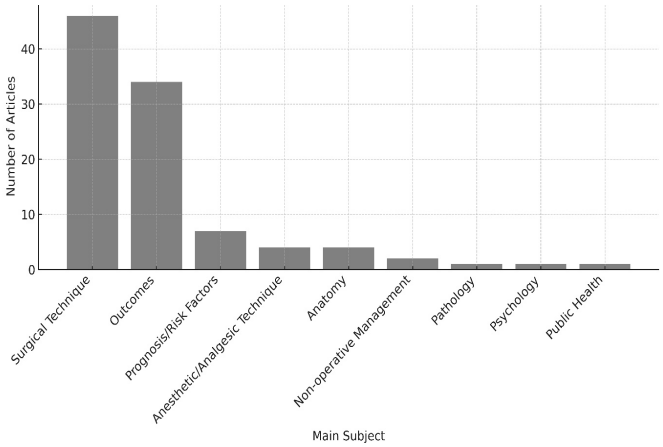

Figure 1. Distribution of the main subjects addressed in the top 100 most cited articles on genioplasty

When the study designs were examined, retrospective cohort studies were the most commonly used, with 35 articles, followed by prospective cohort studies (n=25) and case series (n=20). Other, less frequently employed designs included case reports (n=8), reviews (n=5), expert opinions (n=4), and randomized controlled trials (n=3) (**Figure 2**).

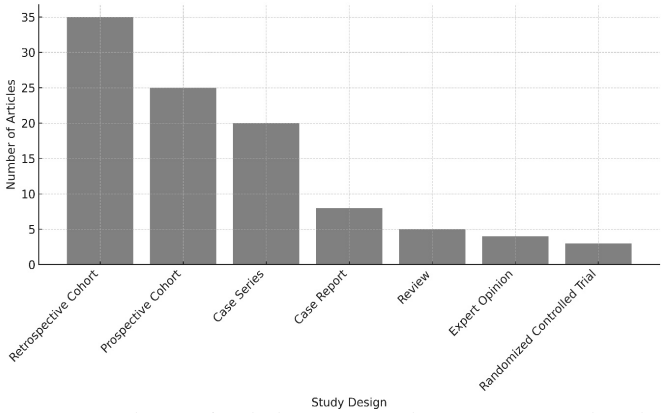

Figure 2. Distribution of study designs among the top 100 most cited articles on genioplasty

DISCUSSION

This bibliometric analysis systematically evaluated the scientific output in the field of genioplasty, revealing key trends, high-impact studies, and methodological gaps. Examination of the most frequently cited articles showed that their primary themes focused on the technical aspects of genioplasty, soft and hard tissue outcomes, complications, and its relationship with adjunctive surgical procedures. For instance, the most highly cited article defined surgical safety margins against potential nerve injuries by analyzing the anatomical course of the mandibular nerves during genioplasty.[8] This study specifically recommends performing the osteotomy at least ~4-5 mm below the inferior border of the mental foramen and highlights that, in cases of micrognathia, the mental foramen may be located closer to the inferior margin of the mandible. Indeed, a recent study utilizing modern imaging techniques confirmed the classic "5 mm rule" and even suggested that in certain skeletal anatomies, a distance of 7-9 mm may be necessary to eliminate the risk of nerve injury entirely.[9]

A significant portion of the highly cited publications focus on changes in the soft tissue profile. For instance, the pioneering studies conducted by Gallagher et al.[10] in the 1980s quantitatively demonstrated positional changes in the chin and lips following genioplasty. In Polido's[11] retrospective analyses, patients who underwent advancement genioplasty showed an average of ~0.8-0.9 mm of soft tissue advancement for every 1 mm of bony advancement. This finding has been confirmed by numerous subsequent studies and plays a critical role in helping surgeons manage patients' aesthetic expectations. Indeed, a large case series published in 1991 demonstrated that in patients who underwent an average of 11.7 mm of advancement genioplasty, 76% of the bony projection was maintained (24% resorption), and the soft tissue followed the bony movement by approximately 88%.

In light of these studies, it has become evident that bony movement in chin aesthetics is largely predictable in terms of external projection; however, in cases of excessive advancement, soft tissue may act as a limiting factor. For example, Rosen's[12] work-often referred to as the "aesthetic guidelines for genioplasty"-emphasized that excessive chin advancement could disrupt profile balance by evaluating the position of the lower lip. Rosen advised that "the chin should not be advanced beyond the plane of a retruded lower lip", providing a guideline to help prevent a disproportionate appearance.

The issues of bone stability and resorption also occupy a significant place in the literature. Particularly due to concerns about long-term bone resorption following large advancements, this topic was extensively investigated during the late 1980s and 1990s. In this context, the pedicled genioplasty technique-maintaining soft tissue attachments-was developed, and Bell introduced the "broad-based pedicled genioplasty" approach. The primary objective of this technique is to preserve periosteal and muscular attachments to maintain vascular supply and thereby reduce bone resorption. Indeed, Vedtofte et al.[13] compared 29 cases treated with pedicled versus free (non-pedicled) bone grafts and reported that preserving the soft tissue pedicle resulted in significantly less bone resorption (notably lower in the pedicled group, $p<0.01$) and a reduced risk of postoperative infection. This study demonstrated that pedicled genioplasty provides more predictable long-term outcomes by reducing both bone loss and infection rates. As a result, in modern genioplasty cases requiring significant advancement, it is recommended to preserve the soft tissue pedicle whenever possible or to enhance stability through additional fixation measures.

Complications and neurosensory effects represent another key focus among the most highly cited publications. Numerous studies have consistently reported that the most common complication following genioplasty is temporary paresthesiaof the lower lip and teeth.[14] Genioplasty, due to its anatomical location along the inferior border of the mandible,

has the potential to exert traumatic effects on the inferior alveolar nerve and mental nerve. One of the highly cited studies by Lindquist and Obeid[15] reported altered sensation in the mental nerve region in 10% of patients who underwent isolated genioplasty, whereas this rate increased to 28.5% in objective tests when genioplasty was combined with bilateral sagittal split osteotomy (BSSO).

The bibliometric analysis of the genioplasty literature highlights historical trends and influential studies within the field of jaw surgery. In our review covering the period from 1950 to 2025, it was observed that the majority of the top 100 most cited articles were published from the 1980s onward. Notably, there has been a marked increase in the number of publications since the 2000s, which parallels the overall growth of the orthognathic surgery literature.[16]

An analysis of journal distribution revealed that the majority of publications appeared in leading journals within the field of maxillofacial surgery. The journal with the highest number of articles was the Journal of Oral and Maxillofacial Surgery (JOMS), the official publication of the American Association of Oral and Maxillofacial Surgeons. Indeed, a bibliometric study on orthognathic surgery also reported that JOMS ranked first in terms of both the number of articles and total citation frequency.[17] Interestingly, a significant portion of the articles in our list were also published in plastic surgery journals. In particular, plastic and reconstructive surgery (PRS) and aesthetic plastic surgery have featured studies addressing chin aesthetics from the perspective of plastic surgery. This highlights the dual disciplinary relevance of genioplasty; it holds a strong position in the oral and maxillofacial surgery literature as part of orthognathic and functional surgery, while also occupying an important role in the plastic surgery literature as a component of facial aesthetics.

The author analysis of the top 100 most cited articles reveals the leading contributors and collaborative patterns in the field. Gallagher et al.[10] who introduced several innovative genioplasty techniques during the 1980s, stands out as the most prolific author, with multiple studies included in our list. Bell's groundbreaking work-such as the broad-based pedicled genioplasty technique, profile modifications combined with maxillary surgery, and soft tissue responses-has been widely cited in the literature and has laid the foundation for subsequent research.

In terms of country distribution, while the United States has historically maintained a leading position, it is noteworthy that since the 2000s, countries such as South Korea, China, Japan, Brazil, and Turkey have also produced highly cited studies. Although it has been reported that approximately 70% of the most influential publications in orthognathic surgery originate from North America, the number and impact of contributions from Asia and Europe have been steadily increasing.[18] In particular, studies originating from South Korea, China, and Taiwan have shown a notable increase in both volume and citation impact over the past 10 to 15 years.[17]

The findings regarding the study types of the articles we analyzed reflect the characteristics of the maxillofacial surgery literature. The vast majority of the top 100 most cited articles consist of original research studies. A substantial portion of these original research articles are retrospective cohort studies or case series. Indeed, it has been reported that approximately 54% of the most frequently cited studies in the field of orthognathic surgery are retrospective cohorts or case series, while only a small proportion are prospective or randomized studies.[18]

Genioplasty is increasingly recognized not only as an aesthetic intervention but also as a functional procedure, particularly when combined with genioglossus advancement in the management of obstructive sleep apnea. Recent long-term follow-up studies have shown that this combined approach can significantly improve airway patency, reduce apnea-hypopnea indices, and contribute to enhanced quality of life in affected patients. Moreover, the multidisciplinary perspective highlights that genioplasty should be considered in the broader context of airway, esthetic, and functional outcomes, rather than being limited to cosmetic correction of the chin profile.[19]

Similarly, in our list, randomized controlled trials (RCTs) are virtually absent. Although a few prospective studies with clinical trial characteristics are present, large-scale RCTs remain rare in this field due to ethical and practical challenges. Instead, long-term case series, multicenter retrospective analyses, and meta-analyses have received more citations. Additionally, review articles and technical overviews represent only a small portion of the included publications.

This bibliometric review provides a comprehensive evaluation of the 100 most influential articles on genioplasty published from 1950 to the present. Our discussion findings shed light on how research trends in the field of genioplasty have evolved over time. While early studies primarily focused on the description of fundamental surgical techniques and soft tissue balancing, subsequent publications emphasized reducing complications and improving functional outcomes. In more recent years, there has been a growing focus on digital planning, three-dimensional imaging, and topics such as patient satisfaction and quality of life.

Our bibliometric analysis also highlights the multidisciplinary nature of genioplasty research. In addition to oral and maxillofacial surgeons, specialists from diverse fields -such as plastic and reconstructive surgery, otolaryngology and sleep medicine, and orthodontics- have contributed significantly to this body of literature. This reflects the fact that jaw surgery encompasses multiple dimensions, including aesthetics, function, phonation, and respiration. Indeed, when examining the topics of the most highly cited publications, a wide spectrum is evident-ranging from aesthetic profile analysis, stability and orthodontic planning, to airway patency, protection of sensory nerve function, and biomaterial applications. The distribution of countries and research centers further confirms this multidimensionality, with a broad geographic diversity spanning from North America and Europe to Asia and South America.

CONCLUSION

As a result, the genioplasty literature represents a rich field encompassing both the longstanding surgical experience of the past and contemporary innovations. Such bibliometric studies provide researchers with a comprehensive platform to identify the strengths and gaps within the literature, thereby contributing to shaping future directions in the field.

ETHICAL DECLARATIONS

Ethics Committee Approval

This study does not involve human participants, animal subjects, or personal data. Therefore, ethics committee approval was not required.

Informed Consent

Since this research is a bibliometric study, it did not require informed consent.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Lundström F, Lundström A. Natural head position as a basis for cephalometric analysis. *Am J Orthod Dentofacial Orthop.* 1992;101(3):244-247. doi:10.1016/0889-5406(92)70093-P
2. Grammer K, Fink B, Møller AP, et al. Darwinian aesthetics: sexual selection and the biology of beauty. *Biol Rev Camb Philos Soc.* 2003;78(3):385-407. doi:10.1017/s1464793102006085
3. Hamilton MM, Chan D. Adjunctive procedures to neck rejuvenation. *Facial Plast Surg Clin North Am.* 2014;22(2):231-242. doi:10.1016/j.fsc.2014.01.008
4. Spyropoulos MN, Halazonetis DJ. Significance of the soft tissue profile on facial esthetics. *Am J Orthod Dentofacial Orthop.* 2001;119(5):464-471. doi:10.1067/mod.2001.113656
5. Adobes Martin M, Lipani E, Alvarado Lorenzo A, Aiuto R, Garcovich D. Trending topics in orthodontics research during the last three decades: a longitudinal bibliometric study on the top-cited articles. *Orthod Craniofac Res.* 2020;23(4):462-470. doi:10.1111/ocr.12396
6. Papadopoulos MA. Meta-analyses and orthodontic evidence-based clinical practice in the 21st century. *Open Dent J.* 2010;4(1):92-123. doi:10.2174/1874210601004010092
7. Gutiérrez-Salcedo M, Martínez MÁ, Moral-Munoz JA, Herrera-Viedma E, Cobo MJ. Some bibliometric procedures for analyzing and evaluating research fields. *Appl Intell.* 2017;47(3):1-15.
8. Hwang K, Lee WJ, Song YB, Chung IH. Vulnerability of the inferior alveolar nerve and mental nerve during genioplasty: an anatomic study. *J Craniofac Surg.* 2005;16(1):10-14. doi:10.1097/00001665-200501000-00004
9. Lin HH, Denadai R, Sato N, Hung YT, Pai BCJ, Lo LJ. Avoiding inferior alveolar nerve injury during osseous genioplasty: a guide for the safe zone by three-dimensional virtual imaging. *Plast Reconstr Surg.* 2020;146(4):847-858. doi:10.1097/PRS.0000000000007160
10. Gallagher DM, Bell WH, Storum KA. Soft tissue changes associated with advancement genioplasty performed concomitantly with superior repositioning of the maxilla. *J Oral Maxillofac Surg.* 1984;42(4):238-242. doi:10.1016/0278-2391(84)90455-5
11. Polido WD, De Clairefont Regis L, Bell WH. Bone resorption, stability, and soft-tissue changes following large chin advancements. *J Oral Maxillofac Surg.* 1991;49(3):251-256. doi:10.1016/0278-2391(91)90214-7
12. Rosen HM. Aesthetic guidelines in genioplasty: the role of facial disproportion. *Plast Reconstr Surg.* 1995;95(3):463-472.
13. Vedtofte P, Nattestad A, Hjørting-Hansen E, Svendsen H. Bone resorption after advancement genioplasty. *J Craniomaxillofac Surg.* 1991;19(3):102-107. doi:10.1016/s1010-5182(05)80571-2
14. Khan M, Sattar N, Erkin M. Postoperative complications in genioplasty and their association with age, gender, and type of genioplasty. *Int J Dent.* 2021;2021:1-5. doi:10.1155/2021/8134680
15. Lindquist CC, Obeid G. Complications of genioplasty done alone or in combination with sagittal split-ramus osteotomy. *Oral Surg Oral Med Oral Pathol.* 1988;66(1):13-16. doi:10.1016/0030-4220(88)90057-6
16. Grillo R. Orthognathic surgery: a bibliometric analysis of the top 100 cited articles. *J Oral Maxillofac Surg.* 2021;79(11):2339-2349. doi:10.1016/j.joms.2021.06.004
17. Shi Y, Guo S, Wang H, Yao Q, Wang D, Cheng J. The top 100 highly cited articles on surgery-first orthognathic surgery between 2009 and 2022: a bibliometric and visualized analysis. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2024;137(5):463-475. doi:10.1016/j.oooo.2023.12.794
18. Susarla SM, Tveit M, Dodson TB, Kaban LB, Hopper RA, Egbert MA. What are the defining characteristics of the most cited publications in orthognathic surgery? *Int J Oral Maxillofac Surg.* 2018;47(11):1411-1419. doi:10.1016/j.ijom.2018.04.016
19. Li KK, Guilleminault C, Riley RW, Powell NB. Genioglossus advancement and genioplasty in obstructive sleep apnea treatment: a 10-year update. *Sleep Med Rev.* 2019;45:1-10.