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Landmarks in facial reanimation – a bibliometric analysis of the 50 most cited papers in dynamic facial reconstruction

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Summary

Background: Advances in the field of facial reanimation surgery have resulted in an increase in the quantity of published research in the international literature. The aim of this work is to provide the reader a synthesized view of the most influential themes, articles and authors in this field. **Material and methods:** We searched the Clarivate Analytics Web of Science Citation Index to identify the 50 most cited papers in dynamic facial reanimation in the past 70 years. Data regarding article title, authors, year of publication, total citations and citation index was obtained. Results are presented using descriptive statistics. **Results:** The most cited articles were distributed in 16 journals. Plastic and Reconstructive Surgery had the highest number of highly cited works with 27 articles, followed by JPRAS (5 papers) and the Journal of Neurosurgery (4 papers). The United States contributed most (17 papers), followed by Canada and Japan (6 each). Dr. Julia K. Terzis was the most cited author (7 works). Case series and comparative studies were the most prevalent type of article published (96%) from 1953 to 2015. The most cited paper focused on free functional muscle transfer (FFMT). Most articles were level IV research, with a mean citation index of 5.27 ± 2.85. **Conclusion:** This collection offers a clear overview of the key milestones and advancements in the field. We expect it serves as a practical resource for clinicians and researchers striving to advance the science and practice of facial reanimation surgery.

Key words

facial paralysis - facial nerve - facial reanimation - free functional muscle transfer - nerve transfer - nerve graft - nerve repair - bibliometry

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Introduction

Facial palsy is a profoundly disabling condition that negatively affects multiple aspects of a patient's life, including interpersonal communication, ocular protection, nasal airflow, and self-image [1,2]. Historical records document clinical observations of facial palsy in ancient times, but it was not until Charles Bell's seminal description of the seventh cranial nerve that the underlying pathology of this condition began to be understood [3].

In the late 19th century, numerous surgeons developed static procedures to restore facial symmetry at rest; however, achieving effective facial reanimation remained largely elusive. At the beginning of the 20th century, procedures such as temporalis muscle transfer gained popularity. Yet, it was the advent of the surgical microscope in the latter half of the century that revolutionized the field. This breakthrough enabled surgeons to perform precise nerve repairs and free muscle transfers, marking a pivotal moment in the evolution of facial reanimation surgery. This progress sparked a surge of interest in the field and led to a proliferation of scholarly publications [4–6].

Citation analysis is an established bibliometric method that catalogs research papers based on the number of times they have been referenced. This type of study provides an index of the most influential themes, articles, and authors within a field [7]. Moreover, citation analyses are valuable for identifying "classic" or seminal publications within medical specialties [8].

While citation analyses have been conducted in various subfields of plastic surgery, such as craniofacial surgery and microsurgery, few efforts have been made to define the most influential literature in the field of facial reanimation [9–11]. Therefore, the objective of this work is to identify and analyze the 50 most-cited articles in facial reanimation surgery over the past 70 years.

Methods

A literature search was performed using Clarivate Analytics' Web of Science Citation Index (SCI) to identify the 50 most cited articles related to facial reanimation surgery published between 1950 and 2022 [15–64]. The database was accessed in October 2023. Search filter terms included: facial nerve, facial paralysis, facial palsy, facial nerve reconstruction, and facial reanimation.

The authors browsed through all the titles and abstracts to ensure that articles referring exclusively to facial reanimation procedures were included. Only original research articles were included; review articles or editorials were excluded.

Each article was examined for its number of citations, authors, study design (case series, cohort studies, randomized control trials, reviews), level of evidence as described by the Oxford Centre for Evidence-based Medicine, type of procedure (nerve repair, cross face nerve grafts, nerve transfers, functional muscle transfers), year of publication, citation index (number of times cited / years since publication), journal's impact factor and country of origin.

All data was entered into a Microsoft Excel spreadsheet. Descriptive statistics were employed for analysis. Continuous variables are expressed in central tendency measures, and categorical values are presented as percentages.

Results

The 50 most cited papers in facial reanimation surgery accumulated a total of 5,660 citations, with individual citations counts ranging from 65 to 516 (mean 113.2 \pm 72.32). The average number of years since publication were 25.52 \pm 13.69, and the mean citation index was 5.27 \pm 2.85. The earliest publication dated back to 1953, while the most recent one was published in 2015 (Tab. 1).

The most cited paper was "Free gracilis muscle transplantation, with mi-

Tab. 1. Fift	۲ab. 1. Fifty most cited papers in facial reanimation surgery.					
Ranking	Title	Author	Country	Affiliation	Relevance	
1	Free gracilis muscle trans- plantation, with microneuro- vascular anastomoses for the treatment of facial paralysis. A preliminary report	K. Harii	Japan	Tokyo Metropolitan Police Hospital, Fu- jimi, Chiyoda-ku Tokyo, Japan	Proved that microvascular tech- niques could deliver reliable re- sults and recreate a spontaneous and symmetrical smile	
2	Hypoglossal-facial nerve in- terpositional-jump graft for facial reanimation without tongue atrophy	M. May	USA	University of Pittsburgh School of Medicine, PA, USA	Great reduction in morbidity and facial mass-movements with use of the hypoglossal nerve as donor	
3	Smile reconstruction in adults with free muscle trans- fer innervated by the mas- seter motor nerve: effective- ness and cerebral adaptation	R. T. Mank- telow	Canada	Toronto General Hos- pital, Hospital for Sick Children and Toronto Western Hospital, Uni- versity Health Network, Canada	Popularized the nerve-to-masse- ter as a donor and showed corti- cal readaptation is possible when using an extrafacial donor nerve for smile restoration	
4	Analysis of 100 cases of free- muscle transplantation for fa- cial paralysis	J. K. Terzis	USA	Eastern Virginia Medical School, Norfolk, VA, USA	One of the first large series on free flap facial reanimation, show- ing positive outcomes and few complications	
5	Hypoglossal–facial nerve anastomosis for reinnerva- tion of the paralyzed face	J. Conley	USA	St. Vincent´s Hospi- tal and Medical Center, Manhattan, NY, USA	Described one of the first reliable and reproducible strategies for fa- cial reinnervation	
6	One-stage transfer of the latissimus dorsi muscle for reanimation of a paralyzed face: a new alternative	K. Harii	Japan	University of Tokyo, Graduate School of Medicine, Toykyo, Japan	Provided a single-stage alternative to the gracilis muscle transfer	
7	Cross-facial nerve grafts and microneurovascular free muscle transfer for long es- tablished facial palsy	B. M. O'Brien	Australia	St. Vincent's Hospital, Melbourne, Australia	Established the classical two-stage reconstruction for gracilis muscle transfer	

Tab. 1 – continuing. Fifty most cited papers in facial reanimation surgery.					
Ranking	Title	Author	Country	Affiliation	Relevance
8	A comparison of commissure excursion following gracilis muscle transplantation for fa- cial paralysis using a cross-face nerve graft versus the motor nerve to the masseter nerve	YC. Bae	Canada	Hospital for Sick Chil- dren, Toronto, Ontario, Canada	First comparison between two reinnervation strategies for FFMT, showing equivalent results be- tween them
9	The "Babysitter" Procedure: minihypoglossal to facial nerve transfer and cross-fa- cial nerve grafting	J. K. Terzis	USA	Eastern Virginia Medical School, Norfolk, VA, USA	Bridged immediate functional re- covery with long-term dynamic fa- cial reanimation, setting a bench- mark for staged facial nerve repair
10	Facial animation in children with Moebius syndrome after segmental gracilis muscle transplant	R. M. Zuker	Canada	Hospital for Sick Chil- dren; and the University of Toronto, Canada	One of the first series present- ing postop results of patients with Moebius syndrome who under- went gracilis transfer
11	Lengthening temporalis my- oplasty and lip reanimation	D. Labbé	France	Caen University Hospi- tal, France	Modified the classical tempora- lis transfer to improve smile excur- sion and reduce bulk
12	Pectoralis minor: a unique muscle for correction of fa- cial palsy	J. K. Terzis	USA	Eastern Virginia Medical School, Norfolk, VA, USA	Presented an early alternative for FFMT
13	Results of management of fa- cial palsy with microvascular free-muscle transfer	B. M. O'Brien	Australia	St. Vincent's Hospital, Melbourne, Australia	Established FFMT as a gold stand- ard for facial reanimation in long- standing paralysis cases
14	The pectoralis minor vascu- larized muscle graft for the treatment of unilateral fa- cial palsy	D. H. Harrison	UK	Mount Vernon Hospi- tal, Northwick Park Hos- pital, Edgware Gen- eral Hospital and Barnet General Hospital, UK	Introduced the pectoralis minor as a reliable option for facial reanimation
15	Masseteric-facial nerve coaptation – an alternative technique for facial nerve reinnervation	C. J. Coombs	Australia	Royal Children's Hospi- tal, Flemington Road, Parkville, Melbourne, Victoria, Australia	Introduced the masseteric-fa- cial nerve coaptation as an effec- tive alternative for facial nerve reinnervation
16	Facial reanimation using the masseter-to-facial nerve transfer	M. J. A. Klebuc	USA	Institute for Reconstruc- tive Surgery, The Meth- odist Hospital, Houston, TX, USA	Further refined the use of the masseter-to-facial nerve transfer as a successful method for facial reanimation
17	Surgical support in perma- nent facial paralysis	C. R. Mc Laughlin	UK	Queen Victoria Hospital, East Grinstead, UK	One of the first large series focused on the integral management of patients with facial palsy, with static and dynamic procedures
18	Hemihypoglossal-facial nerve anastomosis in treating uni- lateral facial palsy after acoustic neurinoma resection	H. Arai	Japan	Juntendo University, Tokyo, Japan	Introduced a technique to reduce morbidity after hypoglossal nerve transfer
19	A new technique for hypo- glossal-facial nerve repair	M. D. Atlas	Australia	St. Vincent's Hospital, Sydney, Australia	Introduced the concept of suturing the facial nerve to the hypoglossal to reduce tongue morbidity
20	The motor nerve to the mas- seter muscle: an anatomic and histomorphometric study to facilitate its use in fa- cial reanimation	G. H. Borschel	Canada	Hospital for Sick Chil- dren; and the University of Toronto, Canada	Described a detailed assessment on the gross and microscopic anat- omy of the nerve-to-masseter and described a reliable method for lo- cating the nerve

Tab. 1 – co	Tab. 1 – continuing. Fifty most cited papers in facial reanimation surgery.					
Ranking	Title	Author	Country	Affiliation	Relevance	
21	Hypoglossal-facial nerve side-to-end anastomosis for preservation of hypoglos- sal function: results of de- layed treatment with a new technique	Y. Sawamura	Japan	University of Hokkaido, School of Medicine, Sapporo, Japan	Initial description of the hemy- hipoglossal nerve transfer	
22	Reconstruction of the face through cross-face-nerve trans- plantation in facial paralysis	H. Anderl	Austria	University Hospital, Innsbruck, Austria	First report of a cross-face nerve graft	
23	Cross-face nerve graft with free-muscle transfer for rean- imation of the paralyzed face: a comparative study of the single-stage and two-stage procedures	P. A.Vinod Kumar	Egypt	Whiston Hospital, Prescot, Liverpool, UK	Challenged the classical notion that gracilis muscle transfer has to be done in two stages for unilat- eral facial palsy	
24	A new technique to correct facial paralysis	G. Freilinger	Austria	Vienna University Med- ical School, Vienna, Austria	First report of a CFNG used to rein- nervate a muscle flap for facial reanimation	
25	Postoperative functional evaluation of different rean- imation techniques for facial nerve repair	O. Gun- tinas-Li- chius	Germany	University of Cologne, Koeln, Germany	Analyzes the functional outcome of the mimic musculature after dif- ferent types of facial nerve reani- mation in consideration of electro- physiological data	
26	Cortical adaptation to res- toration of smiling after free muscle transfer innervated by the nerve to the masseter	S. D. Lifchez	USA	Medical College of Wis- consin, USA	Landmark in demonstrating the central nervous system's role in adapting to peripheral nerve transfers for facial reanimation in children with Moebius syndrome	
27	The degree of facial move- ment following microvascular muscle transfer in pediatric facial reanimation depends on donor motor nerve axonal density	A. K. Sny- der-War- wick	Canada	Washington University, School of Medicine, St. Louis, MO, USA	Highlights the importance of nerve quality in achieving success- ful functional restoration	
28	Objective outcomes analysis following microvascular gra- cilis transfer for facial reani- mation a review of 10 years' experience	P. K. Bhama	USA	Harvard Medical School, Massachusetts Eye and Ear Infirmary, Boston, MA, USA	Presents an analysis on the long- term effectiveness of microvascu- lar gracilis transfer, providing an insight on the possible areas of improvement	
29	Microsurgical strategies in 74 patients for restoration of dynamic depressor muscle mechanism: a neglected tar- get in facial reanimation	J. K. Terzis	USA	Eastern Virginia Medical School, Norfolk, VA, USA	Highlights the importance of ad- dressing the lower lip in facial reanimation	
30	Reanimation of the paralyzed face by indirect hypoglossal- facial nerve anastomosis	J. J. Manni	Holland	University of Maas- tricht, Maastricht, the Netherlands	Showcases an alternative method to restore facial movement in pa- tients with facial paralysis and pro- vides insights into effective surgi- cal strategies for reinnervation	
31	Masseter muscle rotation in the treatment of inferior fa- cial paralysis. Anatomical and clinical observations	P. De Castro Correia	Brazil	Hospital dos Defeitos da Face; and the São Paulo University Medi- cal School, Brazil	Addresses the use of the masseter muscle as a regional donor for fa- cial reanimation	

Tab. 1 – continuing. Fifty most cited papers in facial reanimation surgery.					
Ranking	Title	Author	Country	Affiliation	Relevance
32	Free rectus femoris muscle transfer for one-stage recon- struction of established facial paralysis	I. Koshima	Japan	Kawasaki Medical School, Okayama, Japan	Presents a surgical approach that reduces the need for multiple pro- cedures in patients with long- standing facial paralysis
33	Temporalis tendon transfer as part of a comprehensive ap- proach to facial reanimation	P. J. Byrne	USA	The Johns Hopkins Uni- versity School of Med- icine, Baltimore, MD, USA	Highlights the potential benefits and limitations of temporalis ten- don transfer alongside other es- tablished techniques for facial reanimation
34	Paralysis of the marginal mandibular branch of the fa- cial nerve: treatment options	P. Tulley	UK	Raft Institute of Plastic Surgery, Mount Vernon Hospital, Northwood, UK; Bowen Hospi- tal, Wellington, New Zealand	Discusses treatment options for paralysis of the marginal mandib- ular branch of the facial nerve, fo- cusing on surgical approaches to restore both function and appearance
35	Surgical anatomy for direct hypoglossal-facial nerve side- to-end "anastomosis"	K. Asaoka	Japan	Hokkaido Univer- sity Graduate School of Medicine, Sapporo, Japan	Explores the surgical anatomy for direct hypoglossal-facial nerve anastomosis, highlighting its via- bility and technique for effective facial nerve repair
36	Hypoglossal-facial nerve anastomosis for facial nerve palsy following surgery for cerebellopontine angle tumors	L. F. Pitty	Canada	Toronto Western Divi- sion, Toronto Hospital, University of Toronto, Canada	Examines hypoglossal-facial nerve anastomosis as an effective treat- ment for facial nerve palsy follow- ing cerebellopontine angle tumor surgery
37	Treatment of facial paraly- sis: dynamic reanimation of spontaneous facial expres- sion-apropos of 655 patients	J. Gousheh	Iran	Shahid Beheshti Uni- versity of Med Sciences, Tehran, Iran	Large series on facial reanimation comparing multiple techniques and showcasing their outcomes
38	A comparison of surgical techniques used in dynamic reanimation of the paralyzed face	T. H. Malik	UK	Manchester Royal Infir- mary, Manchester, UK	Comparison of outcomes between direct nerve repair, grafting and hypoglossal nerve transfer
39	Double innervation in free- flap surgery for long-stand- ing facial paralysis	F. Biglioli	Italy	San Paolo Hospital, Uni- versità degli Studi di Milano, Milan, Italy	The first report combining two neural sources for the reinnerva- tion of a gracilis muscle flap
40	Dynamic reconstruction of eye closure by muscle trans- position or functional muscle transplantation in facial palsy	M. Frey	Austria	Medical University of Vi- enna, Austria	Explores dynamic reconstruction techniques for eye closure in facial palsy, comparing muscle transpo- sition and functional muscle trans- plantation, offering insights into effective solutions for improving eye function in affected patients
41	Facial reanimation with jump interpositional graft hypo- glossal facial anastomosis and hypoglossal facial anas- tomosis: evolution in man- agement of facial paralysis	P. E. Ham- mer- schlag	USA	New York University Medical Center, NY, USA	Describes the evolution, advan- tages and disadvantages of dif- ferent modalities of hypoglossal nerve transfer
42	Quality-of-life improvement after free gracilis muscle trans- fer for smile restoration in pa- tients with facial paralysis	R. W. Lindsay	USA	Massachusetts Eye and Ear Infirmary and Har- vard Medical School, Boston, MA, USA	Demonstrates the significant quality- of-life improvement in patients with facial paralysis following free gracilis muscle transfer for smile restoration

Tab. 1 – continuing. Fifty most cited papers in facial reanimation surgery.					
Ranking	Title	Author	Country	Affiliation	Relevance
43	Nerve sources for facial rean- imation with muscle trans- plant in patients with uni- lateral facial palsy – clinical analysis of 3 techniques	J. C. M. Faria	Brazil	Hospital das Clinicas, Sao Paulo, Brazil	Analyzes three nerve sources for facial reanimation using muscle transplant in patients with unilat- eral facial palsy
44	Efficacy of the "baby-sitter" procedure after prolonged denervation	B. Mersa	USA	Eastern Virginia Med- ical School, Microsur- gical Research Center, Norfolk, VA, USA	Delivered evidence that demon- strated that the babysitter pro- cedure is an effective reinnerva- tion method in longstanding facial palsy
45	Transplantation of free au- togenous muscle in the treat- ment of facial paralysis: a clin- ical study	L. Hakelius	Sweden	University Hospital, Uppsala, Sweden	Explores the use of free autoge- nous muscle transplantation in treating facial paralysis, provid- ing clinical evidence on its effec- tiveness in restoring facial function and improving the outcomes
46	Facial reanimation with gra- cilis muscle transfer neu- rotized to cross-facial nerve graft versus masseteric nerve: a comparative study using the FACIAL CLIMA evaluating system	B. Hontanilla	Spain	Clinica Universidad de Navarra, Spain	Compared different donor nerves for FFMT and reports results using an objective scale
47	Dynamic restoration in Moebius and Moebius-like patients	J. K. Terzis	USA	Eastern Virginia Medical School, Norfolk, VA, USA	Evaluates dynamic restoration techniques for patients with Moe- bius syndrome and Moebius-like condition, offering valuable infor- mation on providing facial move- ment and expression in patients with congenital facial paralysis
48	Long-term outcomes of free- muscle transfer for smile res- toration in adults	J. K. Terzis	USA	Eastern Virginia Medical School, Norfolk, VA, USA	Highlights that microsurgical flaps are useful and safe for facial reani- mation in adults
49	Anastomosis of masseteric nerve to lower division of fa- cial nerve for correction of lower facial paralysis. Prelimi- nary report	M. Spira	USA	Baylor College of Medi- cine, USA	Presents preliminary report on the anastomosis of the masseteric nerve to the lower division of the facial nerve as a technique for cor- recting lower facial paralysis, pro- viding early insights into its po- tential effectiveness in improving facial function
50	Free gracilis transfer for smile in children. The Massachusetts eye and ear infirmary experience in excursion and quality-of-life changes	T. A. Hadlock	USA	Massachusetts Eye and Ear Infirmary, Boston, MA, USA	Emphasizing improvements in fa- cial movement and quality of life after FFMT
CFNG – cross facial nerve graft, FFMT – free functional muscle transfer					

croneurovascular anastomoses for the treatment of facial paralysis. A preliminary report". With this article from 1976,

Dr. Harii's group revolutionized the field of facial reanimation by showing that microvascular techniques could deliver reliable results and recreate a spontaneous and symmetrical smile, laying the foundation for multiple innovations and

Tab. 2. Top five most cited authors.					
Ranking	Title	Number of entities	Affiliation		
1	J. K. Terzis	7	International Institute of Reconstructive Microsurgery, Norfolk, VA, USA		
2	R. M. Zuker	5	The Hospital for Sick Children and the University of Toronto, Ontario, Canada		
3	R. T. Manktelow	3	Toronto General Hospital, Hospital for Sick Children and Toronto Western Hospital, University Health Network, Canada		
4	T. A. Hadlock	3	Massachusetts Eye and Ear Infirmary, Boston, MA, USA		
5	K. Harii	2	University of Tokyo, Graduate School of Medicine, Tokyo, Japan		

refinements in years to come. This landmark study remains a cornerstone in reconstructive microsurgery and plastic surgery as a specialty.

The article with the highest citation index was "Smile reconstruction in adults with free muscle transfer innervated by the masseter motor nerve: Effectiveness and cerebral adaptation" by Manktelow et al. (SCI 12.3) [17]. The study highlighted that the masseteric nerve's anatomical location and axonal count make it a reliable and powerful donor for smile restoration. Furthermore, the article delves into the concept of cerebral adaptation, emphasizing the brain's ability to rewire motor pathways to integrate the masseter nerve into facial expressions (Tab. 2).

The articles were published across 16 different journals, with Plastic and Reconstructive Surgery leading with 27 articles (54%), followed by JPRAS/British Journal of Plastic Surgery with 5 papers (10%) and the Journal of Neurosurgery with 4 articles (8%). A total of 16 countries contributed to the top 50 articles, with the USA contributing the most (N = 17, 34%), followed by Canada and Japan with 6 papers each (12%).

There were 126 different authors involved in the 50 articles, with 19 authors contributing with more than a single article. Dr. Julia K. Terzis was the most cited author with 7 works included in the list, she was followed by Dr. Ronald M. Zuker with 5 citations and Dr. Ralph T. Manktelow with 5 entries as well. The subjects of the articles were mostly focused on free functional muscle transfers (N = 22, 44%) and nerve transfers (N = 20, 40%). Regional muscle transfers (N = 6, 12%), cross-facial nerve grafts (N = 4, 8%), direct nerve repairs (N = 2, 4%) and nerve grafting 2% (N = 1, 2%) were the subjects of the remaining articles.

Regarding article type, the vast majority were case series 70% (N = 35), followed by comparative studies 26% (N = 13) and two case reports. The level of evidence of the articles predominantly included level IV research (N = 36, 72%), level III publications (N = 12, 24%), and two articles were of level V.

Discussion

The evolution of facial reanimation surgery over the past seven decades has witnessed remarkable advancements, particularly following the advent of the operating microscope and microsurgical instruments. These breakthroughs resulted in a surge in research interest, fueling the development of diverse surgical techniques and management protocols aimed at restoring facial function and aesthetics [12].

The fields of peripheral nerve and facial reanimation surgery have matured significantly, prompting the quest for identifying "citation classics" – highly cited papers that serve as pivotal reference points within our specialty. Notably, several of these works transcend disciplinary boundaries, emerging as top papers in microsurgery and facial plastic surgery, highlighting the interdisciplinary nature of facial reanimation surgery and its interconnectedness with cooperating medical specialties [11,13].

A previous publication by Boonipat et al. from 2021 analyzed the 50 most cited publications in facial reanimation surgery, offering valuable insights into the field's influential works. However this work did not present a full overview of the evaluated publications, leaving room for further comprehensive evaluation.

Our findings reveal a temporal trend wherein a majority (78%) of the identified classics were published during or after the 1990s. This stands in contrast to the broader field of microsurgery, where seminal publications often originate from the 1970s or 1980s, indicative of the accelerated pace of innovation and knowledge dissemination within facial reanimation surgery in recent decades [14].

Thematic analysis of the top cited articles unveils the dominance of free functional muscle transfers as the preferred technique in 44% of the studies, with the gracilis muscle emerging as the flap of choice for facial reanimation across multiple centers. Additionally, nerve transfers garnered significant attention, encompassing 40% of the analyzed papers, with donor nerves such as the masseter and hypoglossal nerves gaining prominence.

The geographic distribution of the articles shows that the United States contributed with a third of the most cited articles, followed by Canada and Japan with 12% each. While this trend likely reflects the availability of financial resources and robust academic infrastructure in the United States, potential publication bias cannot be discounted, particularly given the predominance of high-impact journals based in the US and "national-citation" bias.

The Plastic and Reconstructive Surgery emerged as the predominant journal in the analysis, holding 54% of the articles and making it a significant platform for spreading impactful research in this field. The prominence of pioneering figures such as Drs. Terzis, Zuker, and Manktelow among the list of authors reaffirms their enduring contributions to facial reanimation surgery, while the inclusion of 123 additional authors underscores the collaborative and ever-evolving nature of our specialty.

This study's design presents certain limitations; first, the reliance on Web of Science as the primary database for citation analysis may lead to bias, and results might vary slightly with the use of alternative databases. On top of that, it must be considered that, while the study reflects the top cited articles in 2023, the dynamic nature of citations implies a constant reshuffling of rankings over time. Despite these limitations, this compilation provides a valuable reference for understanding the historical and scientific evolution of facial reanimation surgery, serving as a comprehensive "must-read" list for both newcomers and seasoned experts in the field.

Conclusion

The compilation of the 50 most cited articles in facial reanimation surgery provides a clear overview of the key milestones and advancements in this field. By identifying these influential works, the study highlights the foundational research that has shaped current practices and offers a framework to guide future investigations. This collection serves as a practical resource for clinicians and researchers striving to advance the science and practice of facial reanimation surgery.

Roles of authors

Jose E. Telich-Tarriba – original idea, project supervision, data analysis, text writing and editing; Alexa Rivera del Río-Hernández – project coordination, data examination, data analysis, text writing and editing; Ricardo Esquiliano-Raya – data retrieval, database construction, text writing; Ximena González-López – data retrieval, database construction, text writing; Cinthya Domínguez Suárez – data retrieval, database construction, text writing.

Conflicts of interest

The authors have no conflicts of interest to disclose. The authors declare that this study has received no financial support. All procedures performed in this study involving human participants were in accordance with ethical standards of the institutional and/or national research committee and with the Helsinki declaration and its later amendments or comparable ethical standards.

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