Bone and Arthrosurgery Science, 2026, Volume 4, Issue 5
https://www.bbwpublisher.com/journal/BAS
Online ISSN: 2981-8222
Print ISSN: 3083-4856

Seeing the Sumeru in a Mustard Seed: Zhu Jiakai and the Pioneering Journey of Microsurgery in China

Manying Xie[1], Zhifang Lu[1]*, Di Lu[2], Xiaoxin Feng[1]

[1]Medicine & Health Science College of Huashang University, Guangzhou Huashang College, Guangzhou 511300, Guangdong, China
[2]Guangzhou University of Chinese Medicine, Guangzhou 510006, Guangdong, China

***Corresponding author:** Zhifang Lu, luzhifang@gdhsc.edu.cn

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: *Purpose:* By organizing and analyzing the content of Zhu Jiakai's interview recording on microsurgery, and combining it with relevant literature, this study aims to reconstruct the early development history of microsurgery in China. *Methods:* Based on the content of the interview recording, relevant literature and materials were retrieved regarding the figures, events, etc. mentioned in the recording, so as to sort out the early development history of microsurgery in China. *Results:* The key figures include Zhu Jiakai, Kuang Gongdao, Wang Shuhuan, Liu Junchi, Yu Guozhong, Pang Shuifa, Zhang Disheng, and Zhu Shengxiu. The main content covers the profiles of the main figures associated with Professor Zhu Jiakai, the key time points, persons, and events mentioned in the recording, the main activities of Professor Zhu Jiakai, and the evolution of microsurgery traced through his personal narrative. *Conclusion:* Based on Professor Zhu Jiakai's interview recording, the early development of microsurgery in China can be divided into four phases: the embryonic phase, the disruption phase, the recovery phase, and the development phase.

Keywords: Microsurgery; Limb (digit) replantation; Microvascular anastomosis; Medical history; Zhu Jiakai

Online publication: November 20, 2026

1. Introduction

Microsurgery is an important branch of clinical medicine. Its development not only represents a tremendous leap in surgical technology but also embodies humanity's profound understanding of and respect for anatomy. Before the early 1960s, limb replantation surgery remained confined to animal experiments, with no successful human cases reported worldwide. In 1963 [1], Chen Zhongwei first reported a successful case of limb replantation, pioneering its clinical application and greatly advancing the development of microsurgery in China. Institutionally, in 1979, with the support of Professor Zhang Disheng, Zhu Jiakai and colleagues

established a microsurgery group and founded an internal journal; on this basis, the *Chinese Journal of Microsurgery* was launched in 1978 [2], and the Microsurgery Branch of the Chinese Medical Association was established in 1989, marking microsurgery's emergence as an independent discipline. Technologically, Chinese scholars have continuously overcome challenges, designing and inventing numerous new flaps and new surgical procedures, promoting the integration of microsurgery with multiple disciplines, and consolidating China's leading position in microsurgery worldwide [3].

Professor Zhu Jiakai [4] (January 1931–February 2021), as a founder and promoter of China's microsurgery cause, practiced medicine for over 50 years, focusing on orthopedics, microsurgery, and hand surgery research. He was among the first in China to perform various vascularized flap transplantations, interfascicular peripheral nerve transplantation, and lymphaticovenous anastomosis. He led the founding of the *Chinese Journal of Microsurgery* and served as Chairman of the Microsurgery Branch of the Chinese Medical Association, among other positions, and possessed a wealth of first-hand materials on the discipline's development. On February 14, 2012, through the arrangements of Professor Xu Dachuan [5] and Professor Gu Liqiang, Dr. Lu Zhifang (then conducting postdoctoral research under Professor Yang Huilin [6] at the First Affiliated Hospital of Soochow University) interviewed Professor Zhu Jiakai at the First Affiliated Hospital of Sun Yat-sen University (see **Figure 1**), leaving a precious recording. By organizing and mining this interview recording, combined with literature verification, this study aims to clarify the early development of microsurgery in China, providing a vivid case and solid evidence for medical history research.

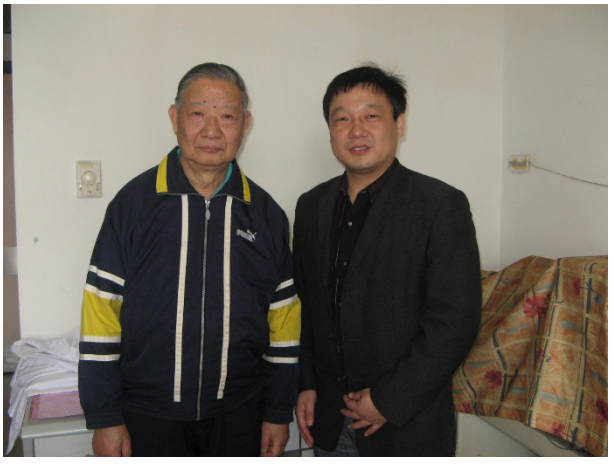


Figure 1. Photograph taken on February 14, 2012, after Dr. Lu Zhifang interviewed Professor Zhu Jiakai at the First Affiliated Hospital of Sun Yat-sen University (left: Professor Zhu Jiakai; the interview recording serves as the core research material for this article).

2. Origins of microsurgery development

The development of microsurgery is closely tied to microsurgical technique. Microsurgical technique refers to surgeons using magnifying glasses or microscopes for magnification, along with fine microsurgical instruments and suture materials, to perform precise surgery on small tissues. In 1921, otolaryngologist Nylen and in 1950, ophthalmologist Barraquer successively used microscopes in surgical procedures; in 1960, American vascular surgeon Jacobson successfully anastomosed blood vessels under the microscope, regarded as a major breakthrough in the history of microsurgery [7]. During this period, the application of microsurgical

technique gradually became active but was far from widespread. It was not until 1963, when Chen *et al.* [1] first reported a successful hand replantation case, that microsurgical technique rapidly attracted widespread attention. Thereafter, Chinese scholars conducted various theoretical studies and extensive clinical practice, achieving a series of important breakthroughs. In 1966, digital replantation was successfully performed, and through unremitting efforts, the survival rate of digital replantation was greatly improved [1] (**Table 1**). Numerous flap repair procedures emerged, vascular anastomosis techniques were modified, toe-to-finger transplantation was invented, and hand allotransplantation was explored. By the late 1970s, through the joint efforts of surgeons led by Professor Zhu Jiakai, microsurgery had gradually developed into an independent discipline.

Table 1. Changes in survival rates of digital replantation before and after Chen Zhongwei's use of the microscope

Time	Replanted digits (*n*)	Surviving digits (*n*)	Survival rate (%)
1966	477	297	62.3
1973 (after microscope application)	126	117	92.9

Notes: (1) Data from 1973 onward record digital vessel anastomosis performed under 10× microscopic magnification [1]; (2) Survival rates were calculated from replanted and surviving digit counts; the difference was statistically significant (*$P < 0.05$); (3) Data were obtained from Zhongshan Hospital Affiliated to Shanghai First Medical College [1].

Professor Zhu Jiakai's journey—from specialized training and learning microsurgical technique to promoting the comprehensive development of microsurgery in China—spanned nearly 30 years of arduous effort. Through the organization and analysis of interview content, combined with literature verification, the research team has divided the main development trajectory of Chinese microsurgery into four stages. Each stage presents distinct historical backgrounds, core tasks, and developmental outcomes, collectively constituting a complete thread of disciplinary development.

3. Germination: Encounter with microsurgery (1963–1964)

Zhu Jiakai went to Beijing Jishuitan Hospital for further training, studying microsurgical technique under Professor Wang Shuhuan, cultivating a strong interest in microsurgery. In 1963, Chen *et al.*'s [1] successful case of limb (distal forearm) replantation filled the global technological gap, providing a "from 0 to 1" breakthrough for China's microsurgery research. Inspired by this case, Professor Zhu Jiakai, after completing his training, went to Beijing for further training with the support and assistance of Professor Kuang Gongdao to study core techniques under Wang Shuhuan, becoming a representative of early researchers and embarking on his "microsurgery journey."

4. Forced stagnation: A thorny path (1966–1969)

The path of developing microsurgery was by no means smooth; on the contrary, it was a road full of obstacles. Lack of materials, backward tools, and social pressures brought enormous resistance to microsurgery research and development. In the early period of the Cultural Revolution, following directives from superiors, Zhu Jiakai was forced to use Chinese herbal medicine to treat severed limbs (digits), but

herbal compresses could not fundamentally solve the blood supply problem, and the results were predictable: none of the 38 cases of severed limbs (digits) survived [8]. The failure of herbal treatment and public criticism cast a shadow over the development of microsurgery. However, Professor Zhu Jiakai and other researchers maintained their original aspirations and convictions despite adversity, avoiding discontinuity in technical inheritance by recording experiences, preserving technical knowledge, and striving to return to clinical practice.

5. Revival: A new dawn (1970–1986)

Microsurgery research was once interrupted, but fortunately, a worker propaganda team member named Deng Rubin recognized that vascular suturing was the key to successful limb (digit) replantation [9]. With his support and encouragement, the spark of microsurgery research in Zhu Jiakai's heart gradually reignited, and microsurgery made a "comeback" [3]. Thereafter, with the approval of the hospital Party committee, an internal microsurgery journal was established in 1978; with the help of Professor Zhang Disheng, a microsurgery group was established in 1979. At this point, China's microsurgery achieved a qualitative leap from microsurgical technique to the discipline of microsurgery [10,11], and the founding of the internal journal [2] brought a bright prospect of "a new dawn."

6. North-south collaboration: Joint pursuit of excellence (1986–1989)

To further advance microsurgery in depth, through Zhu Jiakai's communication and coordination, scholars from both northern and southern China jointly held the first and second microsurgery symposia, and with approval, a microsurgery group was established. On this basis, the Microsurgery Branch of the Chinese Medical Association was founded in 1989 [2], marking microsurgery's formal establishment as an independent discipline and forming a standardized system of "society coordination, journal as carrier, and conference exchange." Thereafter, scholars nationwide used the Chinese Microsurgery Society and the *Chinese Journal of Microsurgery* as bridges, joining forces to push China's microsurgery development to its peak. As the disciplinary leader, Professor Zhu Jiakai promoted the formulation of technical standards, integration of academic resources, and cultivation of disciplinary talent, continuously improving and perfecting China's microsurgery and laying the institutional foundation for subsequent internationalization.

In the interview recording, Professor Zhu Jiakai detailed his collaboration with Professor Zhong Shizhen, revealing the deep connection between microsurgery and anatomy [12]. Professor Zhong Shizhen believed that systematic anatomy needed to be integrated with clinical practice and that the anatomical patterns of blood vessels were crucial. Through extensive cadaveric dissection, he summarized anatomical patterns such as septocutaneous vessels, intermuscular vessels, and musculocutaneous perforators, providing precise anatomical support for microsurgical technique development:

(1) Groin flap research — Zhu Jiakai's team was initially inspired by Daniel's flap technique and Yang Dongyue's inferior epigastric artery flap [13], but lacked sufficient understanding of the anatomical structure. Professor Zhong Shizhen provided specimens and guided vessel localization, resolving the operational challenge of "arteries and veins not running together," facilitating the successful performance of groin flap transplantation;

(2) Lymphatic research — Lecturers from Zhong Shizhen's team studied lymphatic specimens for decades,

demonstrating the course and patterns of superficial lymphatic vessels for Zhu Jiakai's team, facilitating the successful completion of lymphaticovenous anastomosis [2]; subsequently, Zhu Jiakai's team combined hip disarticulation surgical experience to apply deep lymphatic vessels in the treatment of chylous fistula, greatly improving clinical outcomes;

(3) Academic career collaboration — When Zhong Shizhen's team lacked a specialized journal in the early period, they published articles on cross-disciplinary research between anatomy and microsurgery in the internal microsurgery journal. After the *Chinese Journal of Clinical Anatomy* [14] was launched, both parties maintained academic cooperation, further advancing interdisciplinary research.

In addition, Zhu Jiakai's team was the first to propose summarizing microsurgery research directions using the "five smalls" (small vessels, small nerves, small lymphatics, small ducts, and small organ transplantation) [15], among which small lymphatic and small duct (lacrimal canaliculus, vas deferens, fallopian tube) research all relied on anatomical support, embodying the key role of disciplinary integration in technological innovation.

7. Overview of the early development history of Chinese microsurgery

The early development of Chinese microsurgery involved multiple key figures. Those primarily associated with Professor Zhu Jiakai include Kuang Gongdao, Wang Shuhuan, Chen Zhongwei, Deng Rubin, Daniel, Zhang Disheng, Liu Juncheng, Yu Guozhong, Pang Shuifa, Cheng Xuxi, and Zhu Shengxiu. These individuals collaborated in technology R&D, academic promotion, and disciplinary construction, forming a closely collaborative network. The specific relationships and contributions are detailed in **Table 2**.

Table 2. Key figures, their contributions, and their connections with Professor Zhu Jiakai

Category	Figure	Relationship	Core contributions
Guiding mentor	Kuang Gongdao	Teacher and superior	1. Introduced advanced fracture treatment concepts [16] from Germany, promoting orthopedic development in Guangdong; 2. Sent Zhu Jiakai to Beijing Jishuitan Hospital for training; 3. Purchased microscopes and microsurgical instruments to support Zhu Jiakai's microsurgery research.
Technical mentor	Wang Shuhuan	Training supervisor	1. Conducted rabbit ear vascular anastomosis animal experiments (succeeded on the 13th attempt) [17]; 2. Taught Zhu Jiakai small vessel anastomosis technique; 3. Participated in early microsurgery academic exchanges.
Technical mentor	Chen Zhongwei	Academic inspirer	1. Reported the world's first successful case of severed hand replantation in 1963 [18]; 2. Participated in limb (digit) replantation symposia; 3. Promoted microscope application in limb replantation, increasing survival rate from 62.3% to 92.9%.
Supporter	Deng Rubin	Worker propaganda team member	1. Recognized the key role of vascular suturing in limb (digit) replantation success; 2. Encouraged Zhu Jiakai to restart microsurgery research during the Cultural Revolution.
Core collaborator	Zhang Disheng	Academic senior	1. Assisted Zhu Jiakai in establishing the microsurgery group; 2. Promoted microsurgery's establishment as an independent discipline; 3. Supported academic exchanges and journal founding.
Core collaborator	Zhu Shengxiu	Organizational partner	1. Supported preparations for the Microsurgery Branch of the Chinese Medical Association; 2. Assisted in obtaining approval documents for the society's establishment.
Team members	Liu Juncheng *et al.* (3 persons)	Colleagues and core assistants	1. Participated in editing the internal microsurgery journal; 2. Joined the microsurgery group, conducting technical research and clinical practice; 3. Assisted in founding and developing the *Chinese Journal of Microsurgery*.

Category	Figure	Relationship	Core contributions
Microsurgery researcher	Cheng Xuxi	Peer	1. Participated in the first and second microsurgery symposia.
Interdisci plinary collaborator	Zhong Shizhen	Anatomy expert	1. Conducted applied anatomy research for microsurgery, summarizing anatomical patterns such as septocutaneous and intermuscular vessels; 2. Provided groin flap and lymphatic anatomical specimens and technical guidance to Zhu Jiakai; 3. Participated in interdisciplinary research bridging clinical anatomy and microsurgery.
Foreign researcher	Daniel	International peer	1. Visited China as a member of the U.S. delegation to the First Limb Replantation Conference; 2. Demonstrated flap technique to Zhu Jiakai's team, inspiring new procedure development.

Based on the interview recording and literature verification, the key time points, corresponding key figures, and major events in the early development of Chinese microsurgery (1963–1989) are presented in **Table 3**, clearly showing the discipline's developmental trajectory from technical germination to independent maturity.

Table 3. Timeline of events, figures, and milestones from the interview recording

Time	Key figures	Major events	Significance
1963	Chen Zhongwei, Zhu Jiakai	1. Chen Zhongwei reported the world's first successful severed hand replantation; 2. Zhu Jiakai was inspired by this case and established his microsurgery research direction.	1. Filled the clinical application gap in limb replantation, laying the foundation for disciplinary development; 2. Provided key impetus for Zhu Jiakai to devote himself to microsurgery.
1964	Zhu Jiakai, Kuang Gongdao, Wang Shuhuan	1. Kuang Gongdao sent Zhu Jiakai to Beijing Jishuitan Hospital for hand surgery training; 2. Zhu Jiakai studied microvascular anastomosis technique under Wang Shuhuan and participated in rabbit ear vascular anastomosis experiments.	1. Zhu Jiakai systematically mastered core microsurgical techniques, launching his research career; 2. Built a north-south technical exchange bridge, laying the foundation for subsequent collaboration [19].
1966–1968	Zhu Jiakai	1. The Cultural Revolution erupted, and microsurgery research was forced to a halt; 2. Zhu Jiakai was falsely accused of being a "current counter-revolutionary" during a military region consultation and detained by the garrison; 3. Forced to use Chinese herbal medicine for limb (digit) treatment per superior directives; all 38 cases failed, attracting public criticism.	The discipline suffered major setbacks; technical research stagnated; researchers faced dual political and public pressure.
1969	Zhu Jiakai	1. Resumed general surgery resident duties in June; 2. Transferred back to orthopedics six months later.	Preliminary restoration of research conditions, creating a foundation for subsequently restarting microsurgery research.
1970	Zhu Jiakai, Deng Rubin	1. Deng Rubin recognized the key role of vascular suturing and encouraged Zhu Jiakai to restart microsurgery research [3]; 2. Zhu Jiakai resumed microvascular anastomosis practice.	Discipline research broke through difficulties, entering a recovery phase and laying the foundation for subsequent technology dissemination.
1970	Zhu Jiakai, Chen Zhongwei *et al.*	1. The Guangdong Provincial Party Committee proposed "Marching Toward Science," supporting microsurgery exchanges; 2. Zhu Jiakai organized limb replantation symposia, inviting scholars from Shanghai and Beijing; 3. At that time, Chen Zhongwei's team had not yet used microscopes, with a 62.3% limb replantation survival rate, while Zhu Jiakai's team achieved 80%.	1. Promoted normalization of north-south academic exchanges, forming a complementary technical pattern; 2. Highlighted the importance of microscopes in improving surgical success rates, providing data support for subsequent technology popularization.

Time	Key figures	Major events	Significance
1973	Chen Zhongwei, Zhu Jiakai	1. Chen Zhongwei's team began using microscopes for limb replantation, increasing survival rate to 92.9% ($P < 0.05$) [1]; 2. Zhu Jiakai's team conducted external academic exchanges, sharing microvascular anastomosis technique experience.	1. Confirmed the important value of microscopes in microsurgery, promoting technical standardization; 2. Expanded China's microsurgery academic influence, opening the prelude to international exchange.
1978	Zhu Jiakai, Liu Juncheng, Yu Guozhong, Pang Shuifa	1. Applied to the hospital Party committee for 500 yuan monthly funding to establish an internal microsurgery journal; 2. Journal content covered surgical cases (limb replantation, microvascular anastomosis, etc.), foreign literature translations, and experience summaries, and was sent to universities and health institutions nationwide.	1. Built an academic exchange platform for the discipline, filling the journal gap in the field; 2. Accumulated content and resources for the subsequent launch of the *Chinese Journal of Microsurgery* [2].
1979	Zhu Jiakai, Zhang Disheng, Liu Juncheng *et al.*	1. Established a microsurgery group with Professor Zhang Disheng's assistance, specializing in microsurgical technique research; 2. The group systematically advanced research on new flap design and nerve anastomosis technique modification.	1. Gradually formed a specialized research team, promoting systematic technology R&D; 2. Marked microsurgery's transition from "dispersed research" to "concentrated collaborative effort."
1989	Zhu Jiakai, Zhu Shengxiu *et al.*	1. With Professor Zhu Shengxiu's support, obtained approval documents from the Chinese Medical Association; 2. The Microsurgery Branch of the Chinese Medical Association was formally established [6].	Marked Chinese microsurgery's establishment as an independent discipline and its entry into a new stage of standardized, specialized, and systematic development.

Professor Zhu Jiakai's personal experiences and activities ran through the entire early development of Chinese microsurgery. His core activities were mainly concentrated from the early 1960s to the 1980s, including further training in hand surgery, being arrested during a military region consultation, receiving re-education at a cadre school, returning to work as a general surgery resident, being transferred back to orthopedics, contacting northern colleagues to organize symposia, conducting external exchanges, and founding journals and the microsurgery group (see **Figure 2**).

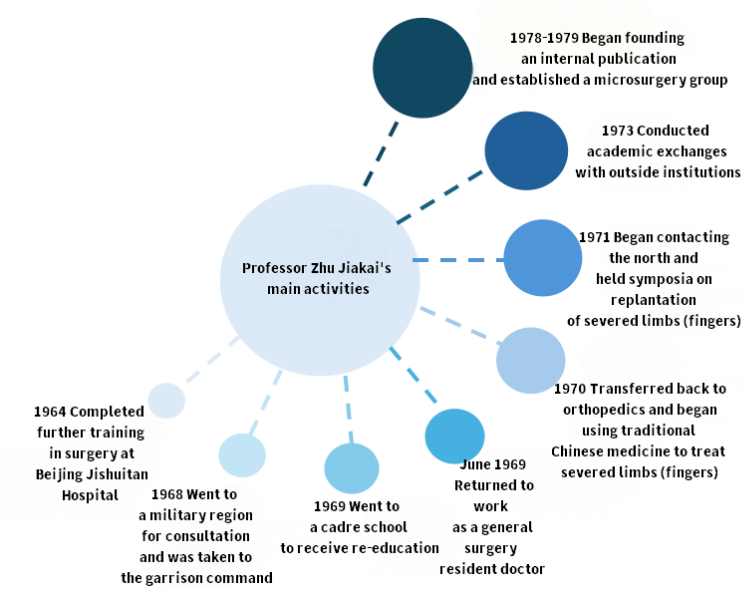


Figure 2. Activity timeline of Professor Zhu Jiakai: (1) The figure is read from left to right, which also follows the chronological order of Professor Zhu Jiakai's main activities; (2) The size of the circles indicates the magnitude of each activity's impact on microsurgery development.

8. Future outlook: A long and arduous road ahead

Medical experts nationwide have made concerted efforts, continuously exploring new possibilities for microsurgery applications in various fields, strengthening their professional skills, actively organizing and participating in domestic and international academic conferences, and extensively exchanging and sharing new research findings and clinical experiences. This has greatly improved the precision and success rate of microsurgery in clinical applications, bringing hope for the clinical treatment of many diseases. Among them, Professor Zhu Jiakai played a particularly critical role in the development of microsurgery. To date, microsurgery has achieved major breakthroughs and remarkable accomplishments in new technology research and application, supermicrosurgery, and basic and reconstructive research on peripheral nerve injury [20], increasingly integrating organically with advanced medical technologies, interdisciplinary professional techniques, modern computer technology, and artificial intelligence [21]. With the maturation of medical technology and the development of advanced science and technology, it is highly likely that various methods for anastomosing ducts, vessels, and tissues will be further improved and simplified [22], the challenge of immune rejection in allotransplantation will be overcome, and methods for treating peripheral nerve injury at the molecular level may be found [10,23].

This article is a study of the early development history of Chinese microsurgery based on interview recordings with Professor Zhu Jiakai. However, the development of Chinese microsurgery is far richer and more multidimensional, with key figures extending well beyond Professor Zhu Jiakai alone. It is hoped that this study will serve as a modest stimulus, encouraging more scholars to research the development history of Chinese microsurgery based on more historical materials and from more perspectives, thereby presenting it comprehensively and multidimensionally and providing inspiration for future generations. The development of Chinese microsurgery still has a long way to go. Young scholars of our generation should learn from the past to understand the present, continuously improve their professional learning abilities, and on the basis of consolidating China's leading position in microsurgery worldwide, promote development and reach new heights.

Acknowledgments

We thank Professor Zhu Jiakai, Professor Xu Dachuan, and Professor Gu Liqiang for their support and assistance.

Funding

China Postdoctoral Science Foundation (2011M500948); Guangzhou Huashang College Horizontal Cooperation Research Project (2024HSHX06)

Disclosure statement

The authors declare no conflict of interest.

Author contributions

Lu Zhifang was responsible for topic proposal, interview recording provision, and manuscript review and

revision; Xie Manying was responsible for draft writing and revision; Feng Xiaoxin and Lu Di assisted with data organization.

References

[1] Chen ZW, 1984, From Limb and Digital Replantation to the Development of Microsurgery. China Historical Materials of Science and Technology, (02): 47–50.

[2] Pang SF, Wang HQ, Yang XL, 1997, Review and Prospects of the Chinese Journal of Microsurgery. Chinese Journal of Microsurgery, (03): 24–26.

[3] Zhu JK, 1994, Commemorating the 30th Anniversary of the First Report of Limb (Digit) Replantation in China. Chinese Journal of Microsurgery, (01): 1.

[4] Gu LQ, 2022, Pioneer of Chinese Microsurgery—Professor Zhu Jiakai. Chinese Journal of Microsurgery, 45(04): C4-3–C4-5.

[5] Xu CD, 2024, Interview with Professor Xu Dachuan. Chinese Journal of Microsurgery, 47(01): 113–114.

[6] Zhang C, 2014, Introduction to Professor Yang Huilin of The First Affiliated Hospital of Soochow University. Orthopedic Biomechanics and Clinical Research, (3): 69.

[7] Chen ZW, 1979, Overview of the Development of Microsurgery. Shanxi Medical Journal, (05): 1–3.

[8] Zhu JK, Lu ZF, 2012, Interview Recording, 4.

[9] Chen ZW, 1982, Development of Limb (Digit) Replantation and Microsurgery in China. World Science, (04): 16–17.

[10] Pang SF, Wang HQ, 1998, Vigorously Promoting and Developing Microsurgery Holds Great Promise. New Medical Journal, (29): 621–622.

[11] Zhong SZ, 2000, Review and Prospects of Basic Research in Microsurgery. Chinese Journal of Microsurgery, (01): 7–8.

[12] Zhong SZ, Sun B, Chen YL, 1984, Advances in Applied Anatomy for Microsurgery. Journal of Clinical Applied Anatomy, (02): 3–4. DOI: 10.13418/j.issn.1001-165x.1984.02.001.

[13] Hou CL, 2007, China's Contributions to World Microsurgery Development. Chinese Journal of Microsurgery, 30(04): 246–249.

[14] He GC, 1993, Evolution of Applied Anatomy in China—Commemorating the 10th Anniversary of the Chinese Journal of Clinical Anatomy. Chinese Journal of Clinical Anatomy, (01): 1–3. DOI: 10.13418/j.issn.1001-165x.1993.01.001.

[15] Zhu JK, 1997, Celebrating the 20th Anniversary of the Chinese Journal of Microsurgery. Chinese Journal of Microsurgery, (03): 5.

[16] Peng ML, 2006, Centennial Figures of Jinan University: Kuang Gongdao. Journal of Jinan University (Natural Science & Medicine Edition), (02): 333.

[17] Wang SH, Lu JZ, 1965, Animal Experiments on Rabbit Ear Vascular Anastomosis. Beijing Medicine, (01): 20–22.

[18] Pei GX, 2013, Fifty years of microsurgery in China, Microsurgery Branch of the Chinese Medical Association. Proceedings of the 10th National Microsurgery Academic Conference of the Chinese Medical Association and the 50th Anniversary Celebration of the World's First Successful Limb Replantation. Xijing Orthopedic Hospital, Fourth Military Medical University, 3.

[19] Zhan HC, Wang GY, 2011, Wang Shuhuan: A Great Physician Who Opened a New Chapter in Hand Surgery in

New China. China Medical Science, 1(02): 1–3.

[20] Wang JL, Wang CQ, 2022, A Decade of Microsurgery. Chinese Journal of Orthopedic Surgery, (24): 2209–2212.

[21] Liu XL, Pang SF, Zhu JK, 2003, Advancing with the Times, Striving to Open New Prospects for Microsurgery in China. Chinese Journal of Microsurgery, (01): 1–2.

[22] Zhu JK, Pang SF, 2000, Propelling China's Microsurgery into the New Millennium. Chinese Journal of Microsurgery, (01): 4–6.

[23] Chen ZW, 1998, Current Status and Prospects of Microsurgery. Chinese Journal of Microsurgery, (01): 1–2.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.