

The History of Shock Wave Medicine Development in China

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The development of shock wave medicine in China can be traced back to the 1980s. At that time, shock waves were applied to treat urinary tract stones with good results. In 1993, Professor Xing Gengyan pioneered the application of extracorporeal shock wave therapy for humeral epicondylitis, marking a significant milestone in the advancement of shock wave medicine in China. With the deepening of research on shock waves and technological advancements, the indications for shock wave medicine have been continuously expanded, achieving good results in treating bone tissue diseases such as delayed fracture healing and non-union. To further promote the experience of shock wave therapy, Professor Xing Gengyan successively held 8 national continuing education programs on “Extracorporeal Shock Wave Therapy for Bone and Muscle Disorders,” training thousands of doctors who mastered shock wave therapy techniques. With the conduct of numerous clinical studies and accumulation of data, the China National Medical Products Administration approved the domestic production of extracorporeal shock wave therapy machines for treating orthopedic diseases in August 2000, marking the official entry of shock wave medicine into a high-speed development phase in China.

As clinical applications continue to advance and expand, Chinese scholars have begun to explore the mechanisms of action of shock waves. In 2004, Professor Xing Gengyan's

research on “Osteoblast Mechanochemical Signal Transduction and Related Gene Expression Following ESWT” was funded by the National Natural Science Foundation of China, resulting in a wealth of published findings. In 2007, Professor Xing Gengyan edited and published the first monograph on shock wave medicine, <Extracorporeal Shock Wave Therapy for Bone and Muscle Diseases (First Edition)>, which consists of two parts and eight chapters. This comprehensive summary of over a decade of clinical application experience and foundational research laid the foundation for shock wave medicine in China.

With the rapid advancement of China's medical level, Chinese scholars' research on shock waves has gradually gained global recognition. A significant number of papers on shock waves published by Chinese scholars has been indexed, and their research achievements have been communicated at international conferences. Concurrently, as the depth of research on shock wave therapy increases and instruments advance, shock waves are no longer confined to treating urinary tract stones, non-unions, osteonecrosis, and tendinopathy [1-4]. They have also achieved promising results in treating myocardial infarction, skin ulcers, tumors, nerve injuries, and male dysfunction, among others.

In December 2013, the Chinese Shock Wave Medicine Professional Committee was established in Beijing, with Professor Xing

Gengyan serving as the inaugural Chairman. Since then, shock wave medicine has had an independent academic organization. Building on past experiences, in 2014, the <Expert Consensus on Extracorporeal Shock Wave Therapy for Bone and Muscle Diseases> was released [5], significantly advancing the scientific and standardized development of shock wave medicine. In 2015, the <Extracorporeal Shock Wave Therapy for Bone and Muscle Diseases (Second Edition)> was published, expanding the volume to 5 articles and 19 chapters, with a significant addition of numerous recent research findings. In July 2016, at the annual meeting of the international society for medical shock wave treatment (ISMST) held in Malaysia, Professor Xing Gengyan was elected as the President of the ISMST. China secured the hosting rights for the 22nd annual conference in 2019, signifying that China is at the forefront of shock wave medicine development worldwide.

The year 2019 marked the most memorable year in the history of shock wave development in Chinese medicine. Building upon the previous two editions of the <Expert Consensus on Extracorporeal Shock Wave Therapy for Bone and Muscle Diseases>, Chinese scholars integrated evidence-based medical experiences and released the <Chinese Guidelines for Extracorporeal Shock Wave Therapy for Bone and Muscle Diseases (2019 Edition) [6], thereby standardizing and scientifically

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Submitted Date: 25 Jul 2023, Review Date: 04 Aug 2023, Accepted Date: 15 Nov 2023 & Published: 30 Dec 2023

© 2023 by Journal of Regenerative Science | Available on www.jrsonweb.com | DOI:10.13107/jrs.2023.v03.i02.87

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advancing the application of shock waves in China. In May of the same year, the ISMST 22nd International Congress on Medical Shock Waves convened in Beijing, attended by over 1,200 experts and scholars from nearly 30 countries. This was the largest-attended conference in the history of shock wave medicine, covering the broadest range of academic interests and delving into the most in-depth discussions on various research topics, significantly advancing the development of shock wave medicine in China.

Currently, over 3,000 hospitals in China possess extracorporeal shock wave therapy

systems, covering treatment fields such as orthopedics, urology, plastic surgery, cardiology, stomatology, oncology, and rehabilitation, treating millions of patients annually [7-9]. Concurrently, Chinese scholars in the field of shock wave therapy are continually innovating, integrating extracorporeal shock waves with techniques such as arthroscopy, stem cells, and nanomaterials to achieve synergistic therapeutic effects, resulting in favorable outcomes [10-12]. Each year, over 500 related research papers are published.

Further, elucidating the biological mechanisms of shock waves in clinical

efficacy at the organizational, cellular, and molecular levels will continuously expand the application scope of shock waves. In response to the relative lack of high-level evidence for shock wave research, the China Shock Wave Medical Association is organizing multi-center, large-sample clinical studies; standardized training for practitioners and accreditation of treatment institutions have also been put on the agenda. It is believed that in the near future, China's shock wave medicine will witness a richer array of research achievements, bringing blessings to more patients.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Conflicts of Interest: Nil. **Source of Support:** None.

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Conflict of Interest: NIL
Source of Support: NIL

How to Cite this Article

Liu S, Xing G | The History of Shock Wave Medicine Development in China. | *Journal of Regenerative Science* | Jul-Dec 2023; 3(2): 03-04.