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The Development of Traditional Chinese Medicine Anesthesia

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Abstract: ***Traditional Chinese Anesthesia refers to the use of acupuncture, herbal medicine, tinctures, washes, ointments, etc. to render the body temporarily insensitive to pain for surgery and related treatments. Having undergone countless vicissitudes over the centuries, traditional Chinese anesthesia has gradually matured in the long river of human civilization. This article reviews the history of traditional Chinese anesthesia, its invention and development, and records the long and arduous process of exploration from the primitive practices of traditional Chinese anesthesia to its refined and precise techniques with its continuous progress.***

Keywords: Traditional Chinese Medicine, Anesthesia, Acupuncture, Development.

1. Introduction

As the cradle of ancient anesthesia, China had accumulated rich practical experience in anesthesia before the introduction of modern anesthesia in modern times. This experience was not only effectively applied but also laid a solid foundation for the development of anesthesia in later generations. During the Eastern Han Dynasty, the famous medical scientist Hua Tuo was the first to apply anesthesia techniques from modern medicine to surgical operations. He not only invented anesthetic drugs but also mastered how to accurately use these drugs to alleviate patients' pain. This revolutionary practice marked an important step forward for humanity in the medical field. Drawing on the wisdom of predecessors in clinical practice and borrowing their beneficial research methods, we seek to explore more advanced and practical anesthesia techniques with Chinese medicine characteristics to meet the needs of patients. This not only has positive significance for the progress of surgical clinical work but also will vigorously promote the vigorous development of the traditional Chinese medicine industry.

2. The History of Anesthesia in Ancient Chinese Medicine

2.1 Anesthesia Records in Ancient Chinese Medicine Literature

The origins of ancient Chinese medical anesthesia techniques can be traced back to the Spring and Autumn period over three thousand years ago. Its profound historical heritage is richly documented in ancient texts such as "Liezi Tangwen" and "Shiji Bianque Liezhuan". It is particularly note worthy that the chapter "Liezi Tangwen" details how Bianque, an outstanding physician of the Warring States period, used "poisonous wine" as an anesthetic during a "heart exploration" surgery [1]. According to the record, "Lu Gonghu and Zhao Qiying both fell ill and requested Bian Que for treatment. Bian Que then gave them poisonous wine, causing them to lose consciousness for three days. He opened their chests, extracted their hearts, replaced them, and administered a miraculous medicine. After they regained consciousness, they both returned home." This record not only demonstrates the exquisite skills of ancient Chinese medicine in anesthesia but also serves as the earliest documented record of anesthesia techniques in the history of ancient Chinese medicine [2]. During the Eastern Han Dynasty, Hua Tuo, with his remarkable medical skills and innovative spirit, pioneered the use of general anesthesia technology, marking the beginning of anesthesia and ushering in a new chapter in medicine, providing valuable experience for future generations. Based on the common "anesthetic effect" of three medicinal herbs - aconite, hyoscyamus niger, and rhododendron - in the "Shennong Bencao Jing", Hua Tuo created "Mafei Powder" [3] and applied it for the first time in surgical operations, making it the first recorded general anesthetic in traditional Chinese medicine. As recorded in the "History of the Three Kingdoms": "If the disease is accumulated inside and cannot be reached by acupuncture and medicine, and it is necessary to perform an incision, one should drink the Ma Fei San (a traditional Chinese medicine), and in a moment, one will seem to be drunk and unconscious. Then, the disease can be removed. If the disease is in the intestines, one should cut off the intestines, clean them, and apply ointment to the abdomen. After four or five days, the condition will improve, and there will be no pain. The person will not wake up on their own, but they will recover within a month [4]. "The Book of the Later Han Dynasty also records the same: "If the illness is internal and inaccessible to acupuncture and medicine, one should first administer Ma Bo San with wine. Once intoxicated, the patient will lose consciousness, and then the abdomen and back can be cut open to extract the accumulation. If the illness is in the intestines and stomach, they should be cut off and boiled, removing the disease and impurities. After that, the incisions should be sutured, and a miraculous ointment applied. The wound will heal in four or five days, and the illness will be completely cured within a month [5]. Hua Tuo, hailed as the "father of surgery" in ancient China [6], made remarkable contributions to the field of surgery, representing the pinnacle of medical achievements during the Han Dynasty. Hua Tuo's original "Mafei Powder" was adopted by multiple countries for its excellent anesthetic effect, and its influence extended to Japan, Korea, and even Morocco, fully demonstrating the extensive influence and profound significance of his medical achievements. In the Jin Dynasty, Ge Hong used "Aconitum kusnezoffii" and "naoyanghua" as the main ingredients to make an anesthetic. In the "Hua Tuo

Shen Fang" written by Sun Simiao in the Tang Dynasty, there is also a prescription called "Ma Fei San", which consists of "three coins of Rhododendron molle, one coin of jasmine root, oneortwo cents of Angelica sinensis, three cents of Acorus calamus, and one bowl of water decocted" [7]. Ancient books record that "taking this can make people anesthetized, suddenly unaware of themselves, and can be cut and broken by others without knowing it". The "Commonly Used Bone-Setting Medicine" recorded in the Tang Dynasty's "Li Shang Xu Duan Fang" uses half a gram of finely ground single-flavor Grass Monkshood mixed with warm wine as an anesthetic. In the "Bianque New Book" written by Dou Cai during the Song Dynasty, it is recorded that the "Sleeping Saint Powder" contains ingredients such as Datura stramonium and hemp flowers. The book states: "People find it difficult to endure the pain of moxibustion with fire, but taking this powder will make them fall into a deep sleep without feeling any pain, and it will not harm them [8]". After taking one dose, one will fall into a deep sleep, and moxibustion can be applied up to fifty times. After waking up, take another dose and apply moxibustion again." The emergence of Sleeping Saint Powder greatly inspired medical practitioners of later generations. They began to add Datura stramonium to anesthetics, but more importantly, they changed their medication concepts, and the dosage was also more strict. In the Yuan Dynasty, Wei Yilin [9] selected different dosages of drugs based on the patient's age, physical strength, and drug resistance, and then made corresponding adjustments according to the patient's condition. In the Yuan Dynasty and beyond, anesthetics were widely used in clinical practice. After the publication of "Puji Fang" in the early Ming Dynasty, "Caowu Powder", which combined the advantages of various anesthetics from the Song and Yuan Dynasties, became a commonly used anesthetic in the Ming Dynasty. In the "Puji Fang," the dosage of "Caowu Powder" is clearly specified for various surgical procedures, reflecting strict dosage standards. In contrast, significant advancements were made in the technology of "local anesthesia" during the Ming Dynasty. Wang Kentang, a renowned physician of the Ming Dynasty, ingeniously combined alcohol with anesthetic drugs, successfully achieving efficient anesthesia effects. During the Qing Dynasty, Wu Qian and Gu Shicheng further elevated the "local anesthesia" technique to a new level. Gu Shicheng successfully performed a cleft lip repair surgery on a patient by using a small sharp knife and an embroidering needle, combined with carefully adjusted doses of anesthetic drugs [10]. Wu Qian, on the other hand, detailed various surgeries in "Yizong Jinjian", all of which were smoothly carried out through local anesthesia techniques, demonstrating his profound understanding and exquisite application of surgical anesthesia techniques.

2.2 Commonly Used Anesthetics in Ancient Chinese Medicine

In the practice of ancient Chinese medicine, "Chuanwu" and "Caowu" are widely regarded as effective prescriptions for anesthesia and analgesia [11], especially among the common people, where they are commonly used to treat pain caused by injuries from falls or blows. Both of these drugs belong to the Aconitum genus. Although their core component, aconitine, possesses significant analgesic effects, it must be used with caution due to its high toxicity. While pursuing its analgesic effect, medical practitioners have continuously explored and finally discovered a drug that can effectively alleviate the symptoms of aconitum poisoning. This discovery undoubtedly adds a new safety guarantee to the practice of anesthesia and analgesia in ancient Chinese medicine. In "Bei Ji Qian Jin Yao Fang" written by Sun Simiao of the Tang Dynasty, there is a "Gan Dou Tang" (Sweet Bean Soup) primarily composed of licorice and soybeans, which is mainly used to treat toxic reactions caused by aconite, croton, and other substances. Licorice and other plants belonging to the legume family are also widely used as valuable medicinal herbs for detoxification in folk medicine. However, the underlying mechanism of action has not yet been fully elucidated. In addition to these traditional detoxifying drugs, ancient medical texts also record two types of drugs with analgesic effects, namely "Frankincense" and "Myrrh" [12], which also occupy an important position in the field of pain treatment. "The Essence of Surgery" states, "People generally believe that the precious medicines of frankincense and myrrh can alleviate pain." In Liu Wansu's "Xuanming Lun," the "Dingtong Pill" also contains "frankincense" and "myrrh." Furthermore, it can be seen from the literature that the combined application of ancient plant-based anesthetic and analgesic drugs with animal and mineral-based drugs largely reflects the importance attached by traditional Chinese medicine to anesthetic and analgesic drugs. The use of animal anesthetics such as "Toad Venom" in the Tang Dynasty's "Yang's Family Recipe Collection" and "White Muscardine Silkworm" in "Shi Zhai Bai Xuan Fang"; the "Li Shang Xu Duan Fang" contains natural copper, unnamed, and other mineral-based anesthetic and analgesic drugs. In addition to the aforementioned methods, we also soak anesthetics in alcohol to create medicinal wine, which can be used both externally and internally, embodying a unique ancient Chinese anesthesia technique. The Tang Dynasty's "Compendium of Materia Medica" records the use of "Hyoscyamus niger" (Hyoscyamus niger L.) as an anesthetic wine and its application in the military field. In the Chinese classical literary masterpiece "Water Margin", we can also find a detailed description of "Menghan Drug". This drug is extremely easy to mix and can dissolve completely in wine. The user is often unconsciously intoxicated by its effect. Obviously, this anesthetic drug has the characteristics of being tasteless or having strong efficacy with a small dosage. From the historical records mentioned above, it is not difficult to observe that as medical practice has progressed, the types of anesthetic drugs have become increasingly diverse, and their sources have also broadened.

3. Development of Modern Anesthesia in Traditional Chinese Medicine

3.1 Application of Traditional Chinese Medicine in Modern Anesthesia

Traditional Chinese Medicine (TCM), as a treasure of Chinese medicine, has accumulated over thousands of years, integrating a vast collection of medical classics and clinical experience. Compared to Western medicine, TCM is characterized by its safety and minimal side effects. Currently, the field of anesthesia in China is gradually focusing on the research of traditional Chinese medicine anesthesia, with the aim of minimizing the side effects of anesthesia and reducing

the damage to patients' bodily functions through the use of traditional Chinese medicine [13]. Through extensive clinical practice, we have observed that traditional Chinese medicine (TCM) has achieved remarkable results in the field of anesthesia. In TCM anesthesia, Datura stramonium is one of the most commonly used anesthetics [14]. TCM anesthesia preparations containing Datura stramonium as the main ingredient have been widely used in various surgical anesthetics due to their unique characteristics and advantages. Meanwhile, toad, clematis root, raw pinellia, raw grass aconite, raw arisaema, and pepper all exhibit good local anesthetic effects [15]. In addition, Chinese herbal medicines such as Murraya paniculata, Zanthoxylum nitidum, and jasmine root, due to their effects of promoting qi circulation and blood flow, dispersing blood stasis and alleviating pain, detoxifying and reducing swelling, can be used to treat pain caused by traumatic injuries [16], and also have a certain local anesthetic effect. There is also a type of traditional Chinese medicine known as poppy opium, which also possesses analgesic properties. In addition, Chinese herbal medicines with anesthetic effects are gradually playing a role in the treatment of schizophrenia, occlusive vasculitis, intractable pain, and traumatic shock. However, similar to the widely used anesthetic drugs, traditional Chinese medicine anesthesia also has certain limitations. Despite this, traditional Chinese medicine anesthesia has accumulated rich experience in clinical practice, and significant progress has been made in its application in the field of anesthesia in recent years. The use of traditional Chinese medicine has brought new development opportunities to the anesthesia industry and promoted innovation and progress in the entire anesthesia field.

3.2 The Development of Acupuncture and Moxibustion in Modern Anesthesia

Acupuncture anesthesia is a combination of acupuncture and moxibustion with anesthesia. Based on the needs of different surgical sites and surgical methods, acupoint selection and acupuncture are performed according to the principles of syndrome differentiation acupoint selection, meridian-based acupoint selection, and local acupoint selection. By twirling the needle or using electroacupuncture stimulation, the patient's pain sensitivity is reduced, and the patient remains conscious, achieving a certain level of anesthesia effect. It is a non-pharmacological anesthesia method that provides a pain-free environment for surgery [17]. Acupuncture anesthesia therapy originated in 1958, when it was successfully applied in tonsillectomy by the Otolaryngology Department of Shanghai First People's Hospital. Subsequently, this therapy was widely promoted in provinces and cities such as Shaanxi and Hubei, and applied to dozens of surgeries in various clinical departments, mainly covering small and medium-sized surgeries, such as gastrectomy, tumor removal, splenectomy, and surgeries on kidneys, bladder, etc [18]. Han Jisheng, a pioneer in Chinese pain medicine, conducted in-depth research on the principles of acupuncture analgesia. He systematically described the distribution patterns of analgesic phenomena induced by acupuncture at human acupoints in both temporal and spatial dimensions, and further confirmed that acupuncture can stimulate the brain to release various chemicals, including serotonin and endorphin, from the nervous system. These substances play an indispensable role in the analgesic process. Meanwhile, it has been observed through experiments that adjusting the frequency of electrical stimulation at acupoints can produce different analgesic effects. Furthermore, it has been found that acupuncture tolerance may occur when the acupuncture duration exceeds half an hour to an hour [19]. Based on the differences in selected acupuncture points, acupuncture anesthesia can be divided into body acupuncture anesthesia, ear acupuncture anesthesia, facial acupuncture anesthesia, nasal acupuncture anesthesia, head acupoint selection acupuncture anesthesia, hand acupuncture anesthesia, and foot acupuncture anesthesia. Among them, body acupuncture anesthesia and ear acupuncture anesthesia occupy a dominant position in clinical practice due to their wide applicability. The commonly used body acupoints are Hegu, Neiguan, Zusanli, futu, Sanyinjiao, zygomatic bone, wengfeng, Fengchi, Yuyao, sagu, Taichong, Jinmen, etc. The auricular acupoints are Shenmen, sympathetic, lung and other acupoints [20]. When selecting acupoints, we follow two principles: one is the principle of syndrome differentiation, that is, the corresponding parts of ear acupoints are selected according to the specific relationship between the surgical site and the corresponding viscera in the theoretical system of traditional Chinese medicine. For example, in orthopedic surgery, the kidney acupoint is selected because the kidney governs the bone; For eye surgery, the liver acupoint is selected, because the liver enlightens the eyes. The second is the principle of reaction point, that is, select the reaction point of the surgical site or the involved viscera on the auricle for acupuncture anesthesia. At present, the commonly used acupuncture anesthesia stimulation methods mainly include hand acupuncture, electroacupuncture and transcutaneous acupoint electrical stimulation [21]. Appropriate intervention methods can be selected according to the needs of surgery to achieve better analgesic effect.

3.3 Combined Acupuncture and Drug Anesthesia

In the 1970s, the initial development of acupuncture anesthesia mainly focused on the idea of alternative drug anesthesia. However, in the 1980s, based on the actual clinical needs, the combined acupuncture and drug anesthesia gradually emerged and became the mainstream of research and application in the field of acupuncture and anesthesia. At present, in clinical anesthesia practice, the use of single anesthetic drugs or methods is not the mainstream, while multi drug and multi method combined anesthesia is more popular. Acupuncture, as an effective means of analgesia, is generally regarded as a key component of compound anesthesia. This view not only conforms to the development trend of modern anesthesiology, but also further strengthens the value of acupuncture anesthesia in modern medicine and promotes its wide application in clinic. Acupuncture drug combined anesthesia is not a simple superposition of drugs and acupuncture. The core is that acupuncture is the leading factor, supplemented by an appropriate amount of narcotic drugs, to jointly realize the analgesic demand in the process of surgery. Studies have found that some drugs and acupuncture have synergistic effects on analgesia, but some drugs may weaken or not affect the analgesic effect of acupuncture. Based on this, clinical analgesic anesthetics are divided into three categories: first, drugs that antagonize the analgesic effect of acupuncture, such as ketamine; Second, drugs that enhance the analgesic effect of acupuncture, such as fentanyl,

etc; Third, drugs that have no significant effect on acupuncture analgesia, such as sulpiride. At present, there are various methods of combined acupuncture and drug anesthesia, mainly including acupuncture epidural anesthesia, acupuncture gas anesthesia, acupuncture sulfur spray anesthesia and acupuncture local anesthesia. These methods are widely used in almost all kinds of operations such as craniocerebral, facial, maxillofacial, neck, chest, abdomen and limbs [22], which fully demonstrates the wide applicability and significant effect of combined acupuncture and drug anesthesia.

4. Conclusion

Anesthesia technology in ancient China, as an outstanding contribution in the field of surgery, has been evolving for thousands of years since Bian que used poison wine. Traditional Chinese medicine, as the cultural treasure of the Chinese nation, its profound theoretical system, unique acupuncture therapy and rich resources of traditional Chinese medicine all show its potential development advantages. In modern medical research, the combination of traditional Chinese medicine and modern anesthesia technology has become a new research direction. This fusion not only helps to reduce the dosage of narcotic drugs, but also shows significant effects in the adjuvant treatment and postoperative analgesia of critically ill patients. This indicates that traditional Chinese medicine anesthesia has entered a new stage of development. However, with the development of traditional Chinese medicine anesthesia, it also faces a series of challenges and problems. Specifically, it is still a necessary and urgent task to build a comprehensive and scientific evaluation system of traditional Chinese medicine anesthesia efficacy; In addition, it is also one of the key directions of current research to deeply analyze the pharmacological mechanism of traditional Chinese medicine anesthetics and reveal their deep-seated mechanism of action; Moreover, the diversity and effectiveness of muscle relaxants in the field of traditional Chinese medicine still need to be further explored and expanded. Therefore, in the future, we should strive to improve and perfect through innovative methods, so as to promote the sustainable and healthy development of the discipline of traditional Chinese medicine anesthesia.

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