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Couching for Cataracts in China

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Abstract

Couching for cataract is one of the most ancient surgical procedures. Maharshi Sushruta, an ancient Indian surgeon, first described the procedure around 600 BC in *Sushruta Samhita*. The procedure, also known as *jin pi shu* in Mandarin, was introduced to China via the Silk Road during the late West Han Dynasty (206 BC - 9 AD), and it spread throughout China during the Tang Dynasty (618 – 907 AD). As the procedure was combined with the Chinese concept of acupuncture, *jin pi shu* was integrated into Chinese medical practice until the founding of the Republic of China in 1911. The government of the Republic of China considered *jin pi shu* to be unscientific. In 1949, the Communists established the People's Republic of China. *Jin pi shu* was revitalized by Chairman Mao (1893-1976), who thought that traditional Chinese medicine, including *jin pi shu*, was a great treasure. After his death and the opening of China to the external world, many Chinese ophthalmologists pointed out that *jin pi shu* has relatively high complications and a low success rate, compared to various modern techniques for cataract surgery. This procedure is gradually fading away in China. The use of *jin pi shu* reflects the history, culture, and political transformation of China.

The operation known as couching or *reclination* for cataract is one of the most ancient known surgical procedures. The Greek philosopher Aulus Cornelius Celsus (25 B.C. – 50 A.D.), who lived during the reign of Emperor Tiberius (14 – 37 A.D.), described the detailed method of couching for cataract in his *De medicina*, a classical medical treatise in Greek and Latin that has survived to the present day.^{1, 2} Celsus explained, “The needle used is to be sharp enough to penetrate, yet not too fine; and this to be inserted straight through ... at a spot between the pupil of the eye and the angle adjacent to the temple, away from the middle of the cataract, in such a way that no vein is wounded. When the spot is reached, the needle is to be sloped against the suffusion itself and rotated gently, guiding it little by little below the pupil. When the cataract has passed below the pupil, it is pressed upon more firmly in order that it may settle below.”

Galen (131-201 A.D.), a physician to five Roman emperors, indicated during the time of Emperor Marcus Aurelius that cataract surgery was practiced in the Alexandrian School and probably originated from Hindustani medicine. The first documented evidence of cataract couching can be found in the writings of Chrysippos, the Stoic philosopher of Soli from the 3rd century B.C., when cataract couching was still unheard of in ancient Egypt and classical Greece. Indeed, the procedure was recorded around 600 B.C. in *Sushruta Samhita*, a treatise

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written by Maharshi Sushruta, an ancient surgeon from India.^{1, 3} The surgeon used a sharp lancet to pierce the sclera, then a blunt instrument (needle) to probe into the eye. Seeing a drop of fluid indicated a successful puncture. The inserted needle was aimed at the suffusion (cataractous lens), and with a downward movement, the lens was dislodged away from the pupil into the vitreous cavity. When the patient was able to see objects, the needle was removed.^{3, 4} Interestingly, the risk of injury with the Indian couching method might be smaller than with the use of just a sharp needle described by Celsus. This simple procedure spread to Europe and attracted many quack doctors throughout the Middle Ages.

In 1583, George Bertisch wrote in his book on the care of the eyes about the practitioners of the art: “Nor is there any lack of old women, vagrant hags, therica sellers, tooth-pullers, ruined shopkeepers, rat and mouse catchers, knaves, tinkers, hog-butchers, hangmen, bum-bailiffs, and other wanton good for nothing vagabonds ... all of whom boldly try to perform this noble cure.” Couching is a relatively ineffective and dangerous method of cataract therapy and often results in patients remaining blind or with their vision only partially restored. The procedure was gradually replaced by extracapsular cataract surgery in the middle of the 18th century, when different surgical techniques for cataract extraction with better outcomes were developed.¹ In modern times, a planned cataract extraction of phacoemulsification and intraocular lens implantation is recommended.

In 1917, Robert Henry Elliot (1864 - 1936), who was the inventor of the sclero-corneal trephine and the superintendent (1904-1913) of the Government Ophthalmic Hospital, the oldest eye hospital in India, built in 1819 in Madras, reviewed the results of couching operations performed by the local or itinerant practitioners. Out of 550 patients, only 20% demonstrated improved vision; in addition, retinal detachment occurred in 54 of the couched eye specimens.⁵ Elliot concluded that the method was crude and filthy. His conclusion only represents the conditions and techniques in India at that time, of course, and results may have been different elsewhere. However, it is hard to imagine that couching could have been very reliable anywhere in ancient times, with non-sterile procedures and inappropriate anesthesia. We may presume that it survived in those eras only for the lack of any alternative.

The procedure of couching for cataract was introduced to China via the Silk Road during the Han Dynasty, which followed the Qin Dynasty (221 - 206 B.C.), when the Great Wall was first built. The reign of the Han Dynasty, including the West Han (206 B.C. - 9 A.D.) and the East Han (25 - 220 A.D.) periods and lasting over 401 years, is one of the greatest eras in the history of China. Today, the ethnic majority of China is referred to as the Han people. During the Han Dynasty, China became a Confucian state and prospered through growth in agriculture, commerce and population.⁶ Confucius (551 – 479 B.C.), a famous Chinese thinker and philosopher, emphasized personal and governmental morality, correctness of social relationships, justice and sincerity. Confucian theories on morality and ethics, with goodness as the core and rites as the norm, served as the keynote of traditional medical practice in China. The empire of the Han Dynasty extended its political, cultural, and territorial influences; the Han Dynasty expanded to north Korea, inner Mongolia, north Vietnam, and east Central Asia (from the current Caspian Sea in the west to central China in the east, and from southern Russia in the north to northern India in the south). To export Chinese silk, a path of caravan traffic became the Silk Road to Central Asia. Subsequently, international cultural exchange began through the Silk Road from China and continued westward beyond the Caspian Sea. Indian travelers, mainly Buddhist monks, introduced various Indian religions such as Buddhism and Brahmanism to China. To promote their religion, these monks provided medical care to the poor. At the end of West Han Dynasty, the Indian method of couching was brought to the Chinese oculists.^{7, 8}

The Chinese historians regard the Tang Dynasty (618 – 907 A.D.), preceded by the Sui Dynasty (580 – 618 A.D.), as a high point in Chinese civilization – equal to or surpassing the Han Dynasty – as well as a golden age of cosmopolitan culture. Its territory, acquired through military campaigns of earlier rulers was greater than that of the Han Dynasty. Chinese culture flourished, and it was considered the greatest age for Chinese poetry. The creative vigor of Tang let it be a more open society, welcoming foreigners from Japan, Korea, and Vietnam, as well as visitors from India and the Middle East. It was during the Tang Dynasty that the first organized school of medicine (*Tai Yi Shu* or Imperial Medical College) run by the government was completed in Xian and that many foreign medical practices became available and widespread in China.

Couching for cataract became more widespread and popular during the Tang Dynasty. Famous poems and stories about couching and cataracts were recorded during the Tang Dynasty. In 752, medical specialist Wang Tao (702-772, Figure 1) authored the book *Waitai Miyao* (The Medical Secrets of An Official), in which the causes and symptoms of cataracts as well as the method of couching cataracts with a metal needle were described.⁹ The figures in this book can still be found in the moxibustion scrolls in the Dun Huang Cave, Gansu Province (Figure 2). The poem *Zeng yan yi bo lu men seng* (a poem presented to an Indian monk and eye doctor), written by the famed mid-Tang poet Liu Yuxi (772 - 842), acknowledged the Indian monk who used the couching technique:¹⁰

These three years have I suffered a disease of the eye, and I cannot see clearly.
Though but middle-aged, I appear to be an old man. Presented with a red object, I
see it as green.

An Indian monk knew *jin pi shu*, an art capable of curing my diseased eye and
helped me to see clearly.

In *Eye Disease of Long Shu*, the first famous Chinese book on ophthalmology, the method of couching cataracts with a (gold) metal needle was mentioned.⁷⁻⁹ Couching for cataract is called *jin pi shu* or *jinzhen bozhang fa* 金針撥障術 (to cure cataracts with a golden needle) in Chinese. The famous poet Bai Juyi (772 - 846), who wrote 2700 poems, suffered from eye disease himself. He wrote a poem expressing his appreciation to Long Shu.⁹

After the Tang Dynasty, *jin pi shu* was adopted and integrated into the Chinese medical mainstream, as the procedure was combined with the Chinese concept of acupuncture.⁸ Acupuncture, moxibustion, herbal medicine, and dietary therapy are the main practices in traditional Chinese medicine. Traditional Chinese medicine is largely based on the philosophical concept that the human body is a small universe with a set of complete and sophisticated interconnected systems and that these systems usually work in balance to maintain healthy function of the human body. For example, the balance of yin and yang is considered with respect to qi (breath or spiritual energy), blood, jing (kidney essence or semen), other bodily fluids, the Wu Xing (the five movements or elements: wood, fire, earth, metal, water), emotions, and the soul or spirit. Traditional Chinese medicine has a unique model of the body, notably aligned with the meridian system, which guides the placement of acupuncture needles.

The assumption that *jin pi shu* could be traced back in “Hung Di Nei Jing” or “Yellow Emperor’s Canon of Internal Medicine”, the oldest medical textbook in the world (800 – 200 B.C.), made the procedure popular. The Yellow Emperor, the “Father of the Chinese Nations” who was credited with teaching the Chinese how to make wooden houses, silk cloth, boats, carts, the bow and arrow, ceramics, and the art of writing, was the inventor of acupuncture. Chinese people were familiar with the story of Hua Tao (110 – 207 B.C., Figure 3), the first of the Taoist physicians and the most famous doctor in ancient China,

who discovered the anesthesia Mafei San (a narcotic drug) and used it in *jin pi shu* to treat Emperor Cao Cao's (155 – 220 B.C.) cataracts.⁸

Jin pi shu became more and more popular in China. During the Qing Dynasty (1644 – 1911 A.D.), Ma Szeyay, who was the private secretary to the chief of the district, had a successful couching of his cataracts. This made the surgery famous and no doubt influenced many to seek the same relief.¹¹ The procedure was performed in the first Chinese-Western hospital in Canton (Guangzhou), which was established by a Yale educated American ophthalmologist, Peter Parker (1804-1888), in 1835.¹² Interestingly, Parker's good friend and mentor, Thomas Colledge (1796-1879), an English missionary physician, was the first Western-trained medical doctor come to China. He practiced in Macau, a small island under Portuguese colonial control in Southern China, in 1827.¹² He also performed couching for Chinese patients with cataracts.

With the violent overthrow of the Qing Dynasty and with its replacement by the Republic of China in 1911, leaders of the country desired to modernize, and Chinese physicians were highly encouraged to study and practice Western medicine.¹³ The government of that time proposed abolishing traditional Chinese medicine and took measures to stop its development and practice. A critical slogan was that traditional Chinese medicine was manifestly unscientific. Therefore, *jin pi shu* was discouraged and replaced by modern surgical techniques for cataract extraction.⁴

In 1949, the Chinese Communist party came to power under the leadership of Chairman Mao Tsetung (1893-1976), and the People's Republic of China was born. After its founding, China's foreign policy initially focused on its solidarity with the Soviet Union, the Eastern Bloc nations, and other communist countries, and opposed the West, particularly the US. In addition, China had gone through the Sino-Japanese war and the civil war between Mao's Communists and Chiang Kai-shek's Nationalists for over 15 years; the country's resources were extremely limited. Consequently, medical service was quite inadequate in the early 1950s in China. Therefore, the new communist government encouraged the application of traditional Chinese remedies because they were cheap, acceptable to the Chinese, and used skills already available in the countryside. Chairman Mao's declaration in 1958 that "Chinese medicine is a great treasure house!" inspired efforts to revitalize traditional Chinese medicine in China. As a result, traditional Chinese medicine regained popularity, and the use of acupuncture and herbal medicine became standard medicine in many hospitals in the late 1950s and 1960s. Currently, the traditional Chinese medicine practices of acupuncture and herbal medicine exist as a parallel medical system to modernized (Western) medicine in China. In this system, both inpatient and outpatient medical care is delivered from large, well-equipped hospitals, as well as private clinics and pharmacies.¹³ Today, traditional Chinese medicine, with its many branches has spread far and wide, gaining popularity in all parts of the world.

With the restoration of traditional Chinese medicine, *jin pi shu* was also revived in the 1960s. It was a required subject for physicians (medical students and residents) who studied ophthalmology in medical schools and hospitals. All ophthalmologists, including my late parents (Figure 4A), were required to learn and practice the procedure in China. My father, Eugene Yao-zhen Chan^{9, 14} who graduated from Boston University Medical School in 1927 and was Dr. William Holland Wilmer's post-doctoral fellow at the Johns Hopkins Medical School in 1929-1934, and my mother, Winifred Wen-shu Mao,¹⁵ who graduated from Western China Union University Medical School in Chengdu in 1937 and completed two post-doctoral fellowships at the University of Toronto and the University of Chicago in 1947-1949, studied *jin pi shu*. During the 1960s, my mother also performed couching on some patients with mature cataracts in the countryside (Figure 4B). Although the traditional

jin pi shu method of pushing the cataractous lens into the bottom of the vitreous cavity was not changed, the couching needle was appropriately sanitized. The eyelids of the cataract patients were sterilized topically with alcohol, and local anesthesia was applied prior to couching, sometimes by acupuncture.

China began the 1960s suffering from the effects of the Great Leap Forward (1958-1961), a plan for the rapid development of agriculture and industry by using China's massive supply of cheap laborers instead of importing heavy machinery. Chairman Mao went into partial retirement, and the country gradually recovered. Nevertheless, by the middle of the decade, Mao decided to return to the spotlight and launched the Cultural Revolution (1966-1976), a mass movement to eradicate capitalism and bourgeoisie influence from the country. The result was widespread social and political upheaval, as well as nation-wide chaos and economic disarray. Many physicians were forced to abandon Western medicine. Traditional Chinese medicine, including *jin pi shu*, was practiced everywhere.

Chairman Mao, who did not want to have a Western operation, demanded that his cataracts be cured using *jin pi shu*. He, like some Chinese, considered *jin pi shu* to be an acupuncture procedure, not a surgery. Dr. Tang Youzhi (Figure 5), an ophthalmologist who practiced traditional Chinese medicine, successfully couched for his left eye cataract on July 23, 1975.¹⁶ My mother observed the surgery in Beijing. The procedure was performed under modern sterility and acupuncture anesthesia. Later, the cataract in Chairman Mao's right eye was also couched. Soon, Dr. Tang became the first Director of the Eye Hospital at the China Academy of Traditional Chinese Medicine in Beijing, China.

Since the famous toast of reconciliation between President Richard Nixon (1913-1994) and Chinese Premier Zhou Enlai (1898-1976) on February 25, 1972, and the historical meeting between President Nixon and Chairman Mao in Beijing in February 1972, China has intensified her efforts to industrialize and modernize, economically and scientifically. Chinese modernization has influenced the practice of Chinese ophthalmology. Because *jin pi shu* has relatively high complications and a low success rate, and various modern techniques for cataract surgery, including intraocular lens implantation, have been introduced, couching for cataract is gradually fading away in China. *Jin pi shu* was used in only 0.52% of the 10,686 cataract operations performed in the Guangdong Province from 1988 to 1989, compared to intracapsular extraction, extracapsular extraction, and unknown modes, which accounted for 68.83%, 25.77%, and 4.88%, respectively.¹⁷ Either extracapsular cataract extraction (887 cases, 87.30%) with intraocular lens implantation (855 cases, 84.15%) or intracapsular cataract extraction (129 cases, 12.70%) was performed in 1,016 cataract cases from a survey of 11,884 persons with the stratified random sample rule in the Shandong Province in 1999, but there were no reported cases of couching for cataract.¹⁸ In a study of willingness to pay for cataract surgery in rural Southern China in 2007, the cost of surgery was determined to be 500 renminbi (US 63 dollars); interestingly, the survey did not even mention couching.¹⁹ Currently, *jin pi shu* is only taught as a traditional and historical procedure to treat cataracts in classes on traditional Chinese medicine, while acupuncture and herbal medicine stay alive and prosper in China. In fact, many young Chinese ophthalmologists who work in modern medical schools and ophthalmology departments have not even heard the term *jin pi shu* during their training.

In summary, the Indian monks transferred the procedure of couching for cataract to China via the Silk Road at the end of West Han Dynasty. The procedure *jin pi shu* was well accepted in the Tang Dynasty, when the country flourished and foreign exchanges were encouraged. Couching for cataract became popular after it was considered an element of acupuncture and integrated into traditional Chinese medicine. This procedure was prohibited in the Republic of China, when the government deemed it to be "unscientific." In the

People's Republic of China, led by the Communist Party, couching for cataract was revitalized, as Chairman Mao believed that traditional Chinese medicine was a great treasure house. After his death and the opening of China to the world, Chinese ophthalmologists were able to compare and practice various modern surgical cataract extractions, and the procedure is vanishing from China once again. In reality, the history and use of couching for cataract in China, *jin pi shu*, reflects the country's history, culture, and political transformation.

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Figure 1.
Wang Tao (702-772)

Figure 2.

A painting in the Dun Huang Cave. The Buddha restores the eyesight of a five robbers to see the truth of the Dharma – a Jataka story. Cave 285, Western Wei, 535 A.D.

Figure 3.
Hua Tuo (110 – 207 B.C.)

Figure 4A.
Drs. Eugene Chan and Winifred Mao in 1954

Figure 4B.
Dr. Winifred Mao (center) examined cataract patients in the countryside

Figure 5.
Dr. Tang Youzhi