History of Orthopaedics

Hippocratic Medicine in China: Comparison with a 9th Century Chinese Manual on Bone Setting

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A R T I C L E   I N F O

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A B S T R A C T

Chinese history annals recorded cultural interchange between China and the Roman Empire during the Han dynasty. The first medical missionaries were Nestorian Christians from the Middle East who arrived in China in AD 635. They introduced Western medical practice into China. This paper compares the first comprehensive Chinese treatise on bone and joint injuries by a hermit monk named Lin and the Hippocratic Corpus. Based on external knowledge from the author's background as well as textual comparison the text of Hippocrates, a remarkable similarity is noted. Although these similarities could have arisen by chance, it is reasonable to hypothesize that traditional bone setting in China originated from the Hippocratic tradition and was later integrated with indigenous herbal medicine.

中 文 摘 要

中國歷史史冊有論證顯示中國和羅馬帝國之間的文化交流在漢代已經出現。第一箇以骨傷科手冊來中國的論者為公元635年，他們是來自中東的基督教徒，把西方的醫療引進中國。於是就有了第一箇對中西醫學之間的相似性比較之研究，它以一個自稱蘭達人之隱士所著作的【中國骨傷手冊】和西方的希波克拉底醫學文獻庫作對比，在作者的背景和希氏的文獻內容分析，有着明顯的相似性。難道就是偶然發生的，然而焉合理的推論使然，中國的固有跌打術可能源於希氏的醫學傳統，後與本土草藥療法融合起來。

註：中國的首本骨科著作《仙授理傷續斷秘方》——自漢以來，古羅馬帝國已與中國交往。西方醫學源自希臘醫學之父希波克拉底；當中不少學說涉及蘭人傳教士來華，最早到華乃基督教之景教派。唐朝會昌年間有一自稱蘭達人之隱士著有【骨傷手冊】，流傳至今，其中不乏與西方希氏之治療方法有異曲同工之處。更有學者推崇蘭氏乃東西來之景教徒，因受迫害而隱居山中。然而中西方之骨傷科創傷學也可以是各自發展形成，相同之處亦可能純屬巧合而已！

Introduction: East—west cultural interchanges

Since the days of the Roman Empire, there has been communication between China and the West through the silk route, as documented in the standard histories of China, such as the History of the Later Han Dynasty1-2:

“The nation of Ta-ch'in [Eastern part of Roman Empire] is to the west of the great sea. [In AD 166] an envoy from King An-tun [Emperor Marcus Aurelius Antoninus, AD 121–180] came to China, bearing gifts of ivory, rhinoceros horns, and tortoise shells.”

Later, in the Old History of the Tang Dynasty2-3:

“In AD 667] an envoy from Fu-lin [Syrian province of the Roman Empire] offered ti-ya-cha [theriac, antidote against all poisons]”

And in the New History of the Tang Dynasty2-4:

“There are clever physicians in Ta-ch'in who open the brain to extract worms and cure blindness.”

Entry of Western medicine into China

After the banishment of the Patriarch of Constantinople Nestorius in AD 431, his teachings spread throughout the Eastern churches.2 There was a strong missionary spirit among them during
the 7th and 8th centuries. Nestorian Christians were famous in western Asia for their medical skills. They translated many Greek medical works into Arabic. It is reasonable to conclude that they also introduced Western medical practices into China.

Alternating between periods of xenophobia and receptiveness in Chinese history, the T’ang dynasty (AD 618–906) opened its doors to foreigners of every order. Missionaries were welcomed, bringing fresh streams of foreign thoughts. Interaction with India, central Asia, and the Near East was carried out via trade routes. Christianity following trade routes had been strongest in commercial centres. The capital Hsi-an-fu (modern Hsi-an in Shensi Province in northwestern China) was a cosmopolitan meeting place where Arabs, Persians, and Syrians met with Koreans, Japanese, and Tibetans to discuss literature and religion with Chinese scholars. A monument erected in 781 commemorating the brilliant doctrine of Ta-ch’in through the Middle Kingdom was unearthed in 1625 at Hsi-an-fu. It documented the arrival of a missionary A-lo-pen (Olpun, an apostle) from the empire of Ta-ch’in in AD 635. On the monument is the following inscription indicative of the medical mission of this religious sect:

“The hungry came and were fed, the naked came and were clothed, the sick were attended to and restored, the dead were buried in repose.”

The first Chinese treatise on bone and joint injuries

A manual dedicated to bone and joint injuries surfaced around AD 846, attributed to a hermit named Lin Tao-jen (literally Lin, a man of the Way, C. AD 790–850): the Secret prescriptions from immortals for the treatment of injuries and bone setting. It commences with practical instructions on management of fractures and dislocations, followed by formularies of 44 decoctions and drugs for external and internal applications.

An anonymous author writes in the preface:

“This work is by a hermit-monk during the T’ang dynasty (Emperor Wei Chang’s reign AD 841–846) … He supported himself by cultivating maize. A villager named Pang visited him often and helped in farming. One day Pang’s son fell to the ground from a tree while logging and broke his neck. He was in great pain, Pang consulted the hermit, who examined the young man, prepared medicine and administered them personally. Pain was immediate relieved, after a few days he recovered. Since then many people came from far and near to seek treatment … He said that he was Lin Tao-jen from the capital … He drank wine and frequently got drunk, sang incomprehensible songs … Later the circuit officers of the province arrived and when they visited the hermit, he was gone, leaving behind his manual on treating injuries.”

Lin recommended short splints for limb fractures that leave the adjacent joints free to move. For compound fractures, he suggested the following 14 steps in fracture treatment: (1) washing with boiled water; (2) assessment of injured part; (3) traction; (4) manipulation; (5) reduction; (6) application of hei-lung-san (literally black dragon powder, containing raw ginger and onion juice, for pain relief and reduction of swelling) to the injured site; (7) application of feng-lu-san (literally wind-flow powder, containing armadillo flesh, cinnamon, and tang-kuei (Angelica dahurica) for antisepsis) to any wounds; (8) bandaging and splinting; (9) oral medication; (10) repeat Step 1; (11) repeat Step 6; (12) repeat Step 7; (13) repeat Step 8; (14) repeat Step 9. Oral herbal medication administered to improvement circulation and healing, active and passive movements of the injured limb were encouraged.

The Hippocratic Corpus

“Theory is the flower, not the root of experience”

Hippocrates of Cos

Orthopaedics in the West began in Greece as a branch of surgery that concerned itself with correction or realigning body deformities subsequent to injuries. It was closely associated with the techniques of treating athletics injuries in the gymnasium. Its foundation is the Hippocratic Corpus. This collection in its extant form contains 60 or so treatises from 460 BC to 350 BC, corresponding to the active lifetime of Hippocrates (the Second or the Great) of Cos (from about 460 BC to 375 BC). It is believed that Hippocrates wrote at least part of the collection to preserve the oral tradition of his family of Asclepiads. The two treatises — On Fractures and On Joints — written by the same author, are remarkable for the competence of the technical analysis and the quality of writing. Exuding the strong personality of the author throughout, these are worthy of admiration among the surgical writings of the Hippocratic school.

Rational and accurate, they reflect a profound practical knowledge and wide experience in the management of these conditions, the results of a long and profound experience. Traditionally attributed to the school of Cos, many believe that these were indeed written by Hippocrates himself.

After the disintegration of the Roman Empire, knowledge of Hippocratic works continued down to the 7th century in the Middle East. From the 8th century on, preservation and inquiry depended on the Arabic translation of Hippocrates. It was through Latin translations of Arabic authors and then of the Greek works that Greek medicine was revived in the West. These were transmitted to the Western world via Greek manuscripts compiled by Appolonius of Kitium between 85 BC and AD 51, and by Soranus of Ephesus in the 2nd century AD. They represented the genuine Hippocratic tradition as transmitted through Greek channels to Byzantium. A 10th century Greek manuscript of the surgical treatises, made by a Byzantine physician was brought from the East and came into the possession of the bibliophile Cardinal Ridolfi. After the fall of Constantinople the transcripts fell into Turkish hands, brought to Crete in 1495 and eventually ended in Florence. At the suggestion of Ridolfi, Guido Guidi (aka Vidus Vidius, 1508–1569) undertook the translation. The illustrations of the book are copies or interpretations of the original Greek drawings. The book, published in Latin, is entitled Surgery translated into Latin from the Greek by Vidus Vidius of Florence together with some commentaries by the same Vidius, Paris 1544.

On fractures

In reducing fractures or dislocations, Hippocrates recommends one should set it in a straight line, for this is its most natural to do. The following are comparable excerpts from the Hippocratic Corpus and Lin’s Secret prescriptions from immortals for the treatment of injuries and bone setting:

Hippocrates on reduction:

“Make extension in as straight a line as possible, for this is most conformable with nature … Then apply bandage.”

Lin on reduction:

“Traction should be applied as near to the fracture as possible, not beyond the adjacent joint. One, two, or three men should be employed depending on the situation.”
Hippocrates on bandaging and splinting:

“The bandage should be clean, light, soft, and thin … The form of bandage should be suitable to the form and affection of the part to which it is applied … At the end of the day the pressure should seem less, and on the third day you should find the bandages loose … bandage again with a little more pressure … tighten up the splints, especially at the fracture, and the rest in proportion. Tighten the splints every third day very slightly … When removing the dressing, douche with warm water and replace it, using a little less pressure and fewer bandages. Apply loose as possible consistently with firmness.”27

Lin on bandaging:

“Splints and bandages should be changed in two or three days in summer; three to five days in winter will suffice. Wash the part with warm decoction, and apply black dragon powder. For wrist, foot, or finger cover with medicated bandage, mobilize frequently. Bath swollen part with warm water apply black dragon powder. Fill in the hollow parts with soft silk cloth. For splints, use strips of bark tied tightly on three sides of the limb, leaving spaces in between.”15

For fractures of the distal radius, according to Hippocrates:

“Dislocation can occur volar, dorsal, radial, or ulnar, the comonest being volar dislocation with fracture of the distal radial epiphysis and displacement of the ulna. In these cases the assistants require strong extension. At the same time, the projecting bone is pressed downward on the table and ulnarly using the heel or the palm, while the counter-extension is applied to the depressed part.”27

Lin:

“In protrusion of the hand, if displaced to the right, pull towards the left; if displaced to the left, pull towards the right. In applying traction assess the direction of the force, either straight or oblique.”15

The role of dietetics

Dietetics in Greek medicine is central to all therapeutics. Dietetics, built as it was on natural philosophy, was the speculative core of Hippocratic medicine.28 Rational Hippocratic therapy consists in correcting by diet and drugs, any imbalance of the four humours (blood, warm and moist; phlegm, cold and moist; black bile, cold and dry; and yellow bile, warm and dry). This was achieved by opposing any deviation in one by its opposite. To a minor degree, dietetics also applied to surgery.26 In acute affections partial witholding of food was held to be indicated; in fevers and cases of wounding, fluid nourishment.29

To the Chinese, diet plays vital roles in maintaining health and preventing illnesses. In its earliest from dietetics was concerned with preparation and administration of foodstuffs in liquids, gruels, and solids to match the severity of the illness.27 Food is the source of energy, bodily activities, and foundation of life. Proper food intake is based on a well-balanced daily diet, avoiding the over- or under-consumption of a particular flavour.29 Because foodstuffs are usually free of side effects, dietetics could be advantageously combined with herbal drug treatment.32 For these two civilizations, to term a substance a food or a drug is sometimes entirely subjective.

Hippocrates on the role of diet:

“Light diet for cases where there is no open wound, it should be restricted for the first ten days, seeing that the patients are resting; and soft foods should be taken … Avoid wine and meat, afterwards gradually feed him up.”27

Lin’s advice on diet:

“Avoid cold dishes, fish, and beef when taking medicine. Medicines should be taken warm to promote blood flow and healing.”

On dislocations

Of all that has been written on orthopaedics, the following classic description account on shoulder dislocation is probably the best known and the least altered33:

The classic Hippocratic method:

“The patient must lie on the ground … Then the operator, seizing with his hand the affected arm to pull it, while with his heel in the armpit he pushes in the contrary direction … A round ball of suitable size must be placed in the hollow of the armpit … Another person must be seated on the other side of the patient to hold the sound shoulder; a supple piece of thong sufficiently broad is placed around it, and some person taking hold of its two ends is to seat himself above the patient’s head to make counter-extension, while at the same time he pushes with his foot against the bone at the top of the shoulder. Or, place the patient on your shoulder, with the shoulder in his armpit. Or with the heel, something being introduced to fill up the hollow of the armpit, using the right foot to the right shoulder. Or, by rotation made with a piece of wood stretched below the arm. Or with the step of a ladder.”34

The techniques are illustrated in Figure 1.

Lin on shoulder dislocation:

“In protrusion of the shoulder, support the armpit with a chair bench covered with cloth, steady the shoulder by one man while two men pull down the wrist followed by rotation; immobilize with bandage.”15

The techniques are illustrated in Figure 2.

For hip dislocations, Hippocrates recommends the suspension (“succussion”) method:

“The patient is to be suspended by the feet from a cross-beam … When the patient is suspended, a person properly instructed and not weak, having introduced his arm between his thighs, place his forearm between the perineum and the dislocated head of the os femoris; then, having joined the other hand to the one thus passed through the thighs, he is to stand by the side of the suspended patient, and suddenly suspend and swing himself in the air as perpendicularly as possible. In some, the thigh is reduced without any apparatus by the aid of slight extension, such as can be managed with the hands and a little jerking; while in many flexion of the leg at the joint and making a circumdumction is found to reduce it.”34

The technique is illustrated in Figure 3.

Lin’s method for hip dislocations:

“For hip protrusion above the buttock, two or three men pull on the thigh, reduce with the foot.”15

The technique is illustrated in Figure 4.
The authorship of the Chinese manual

After the introduction of Greco–Roman–Arabic medicine into China by Nestorian missionaries, remnants of their medical activities inevitably lingered despite their subsequent banishment. From the description of Lin in the preface to his manual, his name, appearance, his diet of maize, his wine consumption, and his incomprehensible songs all suggest that he could be of foreign
origin. His hermitic existence and his abhorrence of authority indicate that he could be a refugee consequent to religious persecution by the State. From the above evidence, it has been hypothesized that Lin was a foreigner, possibly a Nestorian Christian in hiding after banishment of that sect by imperial decree. Such assertions and conclusion on the identity of Lin are caused by misinterpretation of the descriptions of him. The title of Tuo-jen

Figure 2. Chinese methods for reduction of shoulder dislocation. Note the resemblance of the suspension technique over the shoulder, and pushing with the foot, to those in Figure 1. From a facsimile print of a Chinese manual of 1817 in the author’s collection. 

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could be equally applied to Taoist disciples and Buddhist monks. During the T’ang dynasty, due to influx of foreigners, coconut container and wine drinking were not unusual even among strict indigenous religious persons. It was more likely that Lin was a Chinese Taoist priest. Taoism (signifying a “way of life”), the indigenous religion of China, had for its purpose the drawing away of worldly cares to Nature worship. It taught religious, alchemical, and health methods to attain longevity. It flourished during this period and had many followers among the literary and elite. It has been closely associated with traditional medical practice.36 Lin’s
manual is included in an encyclopaedic collection of Taoist works — the Tao Chuan.37

Discussion

Notwithstanding the uncertainties surrounding Lin, his manual is the earliest known Chinese treatise entirely on bone and joint injuries. It represents a continuation and development of orthopaedics in China. From the above comparisons with the Hippocratic Corpus made in this paper there is internal evidence from the language and treatment techniques that Lin’s manual might have incorporated Hippocratic principles. That such medical interchange is not impossible is evident in the flourishing trade communications between China and the West at that time.

Alternatively, it is possible that such similarities in the principles and techniques of treatment could arise spontaneously and simultaneously in two widely separated but well-developed civilizations. Such similarities may be coincidental, arising by way of chance. Four general similarities stand out. Firstly, Greece and China evolved comparably elaborate cultures with concepts and languages that could be used to explore every aspect of individual and collective experience. Secondly, people of both societies saw the need for such enquiries. Thirdly, specialist groups in both societies led in many branches of studies, acquiring new knowledge and understanding. Fourthly, both societies were convinced that what they learned was necessary to understand the place of human in the universal scheme of matter, and that this understanding would be of help in human affairs. In both societies, such investigations would be of intense value.38 Both China and Greece had passed through analogous transitions and have left comparable records from 400 BC to AD 200.

Conclusion

From the comparative analysis in this article, it can reasonably be concluded that traditional Chinese bone setting contains ideas analogous to and may be inspired by the Hippocratic Corpus and later integrated with indigenous herbal medicine.

Conflict of interest

The author declares that he has no financial or non-financial conflicts of interest related to the subject matter or materials discussed in the manuscript.

References


Figure 4. Chinese methods for reduction of hip dislocation. Note the resemblance of the suspension method to that of Hippocratic succussion in Figure 3. From a facsimile print of a Chinese manual of 1817 in the author’s collection.

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