

Goiter disease in traditional Chinese medicine: Modern insight into ancient wisdom

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Abstract: Goiter is a disease with history perhaps as long as human has been around. Almost all the available references are in Western language works of literature while information concerning the occurrence of goiter disease in ancient China and the comparison between the treatment in traditional Chinese medicine (TCM) with current Western medicine remains lacking. In this article, the description of goiter, the history of surgical intervention for goiter disease, and the general concept of goiter disease treatment in ancient China literature such as seaweed decoction and acupuncture analgesia for surgery were reviewed.

Keywords: Goiter, Integrative medicine; Thyroid, Traditional Chinese medicine

1. CLINICAL RELEVANCE

A middle-aged woman was referred for thyroidectomy because of symptomatic tracheal compression. After discussion regarding the potential risks of operation and difficult intubation for general anesthesia, she declined and turned to traditional Chinese medicine (TCM) treatment. After several years, she was asymptomatic with a smaller goiter size. This experience prompted our investigation of goiter management in TCM.

2. PREFACE

Goiter is a disease with history perhaps as long as human has been around. Almost all the available references are in Western language works of literature, started by European anatomists in the 1600s. However, goiter had been depicted in ancient Europe (Berne), India, pre-Columbus Inca stone sculptures, and ancient Egyptian tomb artworks. Surprisingly, no record of goiter management was found in Egyptian papyrus studies.¹ We wish to investigate the occurrence of goiter disease in ancient China and compare the treatment in TCM with current Western medicine.

3. DESCRIPTION OF GOITER IN ANCIENT CHINESE LITERATURE

The relationship between goiter and seaweed was described as early as 2700 BC in China, Supplementary Table 1, <http://links.lww.com/JCMA/A78>.² It was only an orally transmitted legend until documented in the “Sheng Nong’s Herbal Classic” in 300 BC. Sheng Nong (2800 BC), commonly respected as ancestor of herbal medicine in China, was cited to have personally tested or tasted 365 herbs. In Qin–Han Dynasties (221 BC–220 AD), seaweed was recommended for the treatment of goiter disease called “Ing-Liou” (Fig. 1). Seaweed was described to “soften” thyroid nodule, relieve edema and induce diuresis, likely when treating hypothyroid patients. On the other hand, iodine-rich food was described in West-Chou Dynasty (1066 BC–771 BC) to cause goiter disease with features suggestive of hyperthyroidism.

Other observation on endemic goiter was found in the third Century BC China. For example, in “Zhuangzi” (369 BC–286 BC) Chapter De Chong Fu, there was a description of goiter disease “In”. In “Lu’s Commentaries of History, 239 BC” Chapter Jin Shu described people who lived in area with “light water” were more likely to be bald and goitrous.

There are many examples of treatment for goiter disease in TCM literature. Gar Hong (284–363 AD) recommended using seaweed for goiter diseases. In Sui Dynasty (581–618 AD), “General Treatise on Causes and Manifestations of All Diseases”, three kinds of goiter diseases and their treatment were described—hemorrhagic (cyst) goiter by rupture, polypoid goiter by excision, and cystic goiter by puncture. This was also recorded in “Si Ku QuanShu,” an encyclopedia in Qing Dynasty, which was edited by Ji Yun in 1782 AD. Sun Si-Miao, in 652 AD (Tang Dynasty), recommended 10 formulas for treating goiter diseases in “Thousand Golden Prescriptions”. The formulas included seaweed and interestingly sheep or deer “neck and face junction part,” named “yeh,” which likely would have included the thyroid gland. For comparison, in the West, Kocher reported in 1893 treatment of cachexia strumipriva (hypothyroidism) with raw thyroid tissue, and porcine thyroid tablet was commonly used to treat hypothyroidism until levothyroxine was available on market after 1927.

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Fig. 1 Hand sketches of goiter disease in black ink in ancient literature of traditional Chinese medicine.

4. FOR SURGICAL TREATMENT OF GOITER DISEASE

According to History, in the Three Kingdoms Period, 208–280 AD “History of the Three Kingdoms” Chapter Wei, the generalissimo of Wei Kingdom, TsaoTsao advised one of his favorite generals Jhia Kwei not to have goiter operation because the mortality rate for goiter operation was 90%.

Thereafter, because of lack of aseptic technique, loss of ancient formula for heavy sedation (Ma Fei San), and high operative mortality rate, goiter excision became less popular. The trend of TCM shifted toward nonsurgical treatment for goiter diseases. Nevertheless, goiter operation was still an option for treatment in 900s AD during SungDynasty “A Brief History of Ancient Chinese Medicine.” For comparison in the West, the earliest descriptions of thyroidectomy were by Roger Frugardi in the School of Salerno, Italy, in 1170 AD and in the textbook Kitab al-Tasrif by the Islamic surgeon Al-Zahrawi in Cordoba, Spain in 952 AD.

5. GENERAL CONCEPT OF GOITER IN TRADITIONAL CHINESE MEDICINE (TCM)

Based on ancient works of literature and experiences from treating patients with goiter for thousands of years, TCM doctors conceptualized the possible causes of goiter as (1) “psychosomatic”: associated with long-term stress, anger, anxiety, etc. Goiter size may vary with the amount of emotional stress. Persistent stress then lead to the firmness and nodularity of the goiter; (2) “exogenous”: associated with water or food; and (3) “physiological”: associated with menstrual cycles, pregnancy, delivery, and lactation predispose women to goiter diseases when exogenous factors exist.

The symptoms and signs of goiter are described by TCM doctors overall as Zheng-Xing. They are subcategorized into (1) “entangled qi”: goiter size may wax and wane with emotional stress and is reversible with seaweed; (2) “accumulated phlegm”: with mixed components of muddy and calcified nodules, mostly caused by drinking water; (3) “static blood”: with purple-red overlying skin and telangiectasias; (4) “liver wind”: with tortuous venous engorgement over the skin and symptoms of hyperthyroidism, such as trembling and excessive perspiration; and (5) “stony”: stony hard, fixed and non-movable goiters.

6. WHEN EAST MEETS WEST

There were no TCM terms equivalent to the Western medicine description of hypothyroidism or hyperthyroidism. Obviously, such conditions existed in ancient Chinese, but they were described within a different conceptual framework. The anatomical and physiological derangements were categorized as five different symptom-complex as mentioned above. In other words, although the manifestations of goiter disease are the same, how one describes the “symptoms,” such as a neck mass or physiological changes, will differ depending on the conceptual framework of the culture.

In China, Taiwan, and elsewhere in Asia, the practice of TCM persisted in parallel to the practice of Western medicine. Patients may consult with and be cared for by both types of practitioners. Thyroid function tests were introduced into TCM clinical practice in the 1960s. However, it had been sporadically used in Taiwan as early as in 1895 among western trained clinicians. Goiter disease is covered by the Taiwan National Health Insurance Program, as ICD code 9, with benign neoplasm of the thyroid gland: 226, goiter: 240.9, and thyroiditis: 245.³Treatment of hyperthyroidism or hypothyroidism were not based universally by laboratory testing but based on individual symptoms. In ancient TCM, goiter diseases were managed with seaweeds and seashells at different doses according to the patient’s symptoms of heat or cold intolerance. Ancient TCM doctors were aware of the effect of seaweed both for replacement use and for suppression of toxic symptoms (known as the Wolff-Chaikoff effect in Western medicine). We all have patients with goiter disease and high serum titers of anti-thyroid peroxidase/anti-thyroglobulin antibodies, who initially may be hyperthyroid then become hypothyroid and we treat them for symptom control only.

7. TREATMENT FOR GOITER DISEASES IN TCM

According to TCM treatment principles, goiter could be treated based on the clinical manifestation, namely, treatment according to symptoms complex. There is no standardized single or compound herbal treatment of goiter diseases. The medication was personalized and the treatment period was from 45 to 90 days. A combination of symptom-specific herbs was used to treat various symptoms such as pulse features, chills, heat

intolerance, and perspiration, depending on the experiences of physicians. The goal of treatment is not only to control the symptoms but to resolve the goiters permanently without recurrence (to cure).

8. PHARMACOLOGIC INVESTIGATION

Virtually, all formulas used for treating hyperthyroidism contain either seashells or seaweeds or both. They may regulate thyroid hormones beyond providing iodine and may reduce the duration of treatment. Some ingredients used have been shown to reduce immunologic attacks in hemolytic plaque formation tests. According to “TREATMENTS FOR THYROID DISEASES WITH CHINESE HERBAL MEDICINE” (by Subhuti Dharmananda, PhD, Director, Institute for Traditional Medicine, Portland, Oregon), other toxic symptoms such as palpitation, exophthalmos, perspirations, insomnia, etc., were controllable with herbal medication. However, controversies remain because the mechanism of action is unknown and evidence-based studies are lacking. It is important to emphasize that the side effects of herbal medicines in TCM have usually not been well studied and described. Therefore, patients taking such herbal medicine should be under careful surveillance.

9. ACUPUNCTURE FOR SURGICAL TREATMENT OF THYROID DISEASE

Most Western clinicians are skeptical but curious about the application of acupuncture in thyroidectomy. In our hospital, acupuncture was used in tooth extraction, subtotal thyroidectomy, and excision of superficial lesions in 1960–1970, performed by an experienced acupuncturist. Studies from the past decades showed that acupuncture analgesia may be the result of the mobilization of central opioids. Different frequencies of stimulation may mobilize different endorphins centrally: beta-endorphin at 2 Hz, enkephalins at 5 Hz, and dynorphin at 100 Hz.⁴ Imaging studies by functional MRI, although heterogeneous, suggest that acupuncture modulates the activity in specific brain areas.⁵ Several lines of evidence point to the nervous system as the main conduit for the clinical effect of acupuncture treatment.^{6,7}

From our own experience although acupuncture analgesia for thyroidectomy is safe it has some disadvantages. It requires more time for induction. About one-third of patients do not respond. Duration of pain control is limited to 1–2 hours because of tolerance. It also cannot provide adequate muscle relaxation needed for surgery. Because the individual response to acupuncture analgesia can be different and modern anesthetic technique provides better sedation, we have not used acupuncture analgesia for thyroidectomy in our hospital since the late 1970s.

In conclusion, without knowledge of thyroid physiology, goiter disease had been managed with iodine-rich seaweeds and seashells in ancient TCM. Some therapeutic formulas developed by ancient Chinese clinicians appear to fit within current concepts in the treatment of goiter disease. The goal of permanent symptom relief and resolution of goiter mass, however, has not been met by TCM and remains a challenge to future research.

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