

Discussion on the Diagnosis and Treatment of Post-Chemotherapy Lung Cancer Based on the “Cultivating Earth to Generate Metal” Theory

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Abstract: In recent years, Traditional Chinese Medicine (TCM) has demonstrated its advantages in the diagnosis and treatment of lung cancer. This article aims to explore the pathogenesis and treatment of post-chemotherapy lung cancer based on the “Cultivating Earth to Generate Metal” theory. The pathogenesis of post-chemotherapy lung cancer involves deficiency of lung and spleen qi. In clinical practice, methods such as tonifying the lung, strengthening the spleen, promoting qi flow, and resolving blood stasis are employed. By regulating the spleen and stomach to stimulate the lung to restore its normal physiological functions, this approach provides a new perspective for the clinical diagnosis and treatment of post-chemotherapy lung cancer.

Keywords: Cultivating Earth to Generate Metal, Simultaneous Treatment of Lung and Spleen, Post-Chemotherapy Lung Cancer; Deficiency of Healthy Qi and Excess of Pathogenic Factors.

1. Introduction

The incidence and mortality rates of lung cancer rank first among malignant tumors [1]. Early and middle-stage lung cancer generally lacks specific symptoms. By the time patients seek medical attention due to discomfort, most are already in advanced stages and have lost the opportunity for surgery. Modern medical anti-tumor treatments include surgery, radiotherapy, chemotherapy, immunotherapy, and targeted therapy, but the adverse reactions of these methods, such as bone marrow suppression and gastrointestinal reactions, can lead to a decline in physical function [2-3]. Modern research indicates that TCM is effective in anti-tumor activity, alleviating treatment-induced adverse reactions, reducing toxicity and enhancing efficacy, boosting immunity, improving quality of life, improving prognosis, and prolonging survival [4-5]. This study aims to explore the diagnosis and treatment of post-chemotherapy lung cancer based on the “Cultivating Earth to Generate Metal” theory.

2. Theoretical Basis of “Cultivating Earth to Generate Metal”

The “Cultivating Earth to Generate Metal” theory originates from the pre-Qin Five-Element doctrine, proposing that the spleen corresponds to Earth and the lung corresponds to Metal. The Classic of Difficulties (Nan Jing), Chapter 69 states: “For deficiency, tonify the mother; for excess, purge the child,” establishing the treatment principle of tonifying deficiency and purging excess. The Yellow Emperor’s Inner Classic: Su Wen, Chapter 5: Yin-Yang Corresponding Manifestations says: “The spleen generates flesh; flesh generates the lung.” Earth generates Metal; the spleen is the mother of the lung; the lung is the child of the spleen. Disease of the mother affecting the child or disease of the child affecting the mother can both lead to simultaneous disease of the lung and spleen [6]. The Yellow Emperor’s Inner Classic: Su Wen, Chapter 21: Differentiation of Channels and Vessels states: “The spleen disseminates essence, which ascends to return to the lung,”

indicating that the spleen’s transportation and transformation of water, grain, and essence provide the material foundation for the lung’s diffusion and descent functions. By the Jin and Yuan dynasties, Li Dongyuan of the “Tonify Earth School” proposed in Treatise on the Spleen and Stomach: “Injury of the spleen and stomach internally gives rise to all diseases,” and pointed out that the spleen and stomach are the pivot of qi movement, creating the famous formula “Bu Zhong Yi Qi Tang” (Center-Supplementing Qi-Boosting Decoction). Later, the Warm Disease school further expanded the connotation of “Cultivating Earth to Generate Metal,” also considering nourishing yin. Addressing the characteristics of qi and yin deficiency in the late stages of warm diseases, they added yin-nourishing and lung-moistening herbs like Maidong (Ophiopogon), Shashen (Glehnia), and Yuzhu (Polygonatum odoratum) to the qi-tonifying and spleen-strengthening Si Jun Zi Tang (Four Gentlemen Decoction), achieving dual supplementation of qi and yin, forming formulas like Sha Shen Mai Dong Tang (Glehnia and Ophiopogon Decoction) and Shen Ling Bai Zhu San (Ginseng, Poria, and Atractylodes Macrocephala Powder), which remain commonly used for respiratory system diseases. Modern practitioners continue to enrich the “Cultivating Earth to Generate Metal” theory, widely applying it in the treatment of pulmonary malignant tumors, COPD, and other lung diseases.

The spleen and lung organs influence each other physiologically and pathologically. Physiologically, the lung and spleen mutually generate and assist. The spleen governs the transportation and transformation of water, grain, and fluids. The normal physiological function of the lung depends on the spleen’s transforming function. As stated in Su Wen, Chapter 21: “Fluids enter the stomach, overflowing with essential qi, which is transported upward to the spleen. The spleen disseminates essence, which ascends to return to the lung, which regulates the waterways, sending them downward to the bladder. Thus, water essence spreads to the four directions, flowing through the five channels.” The lung “irrigates the four sides,” assisting the spleen in distributing water and grain essence to all organs. Pathologically, lung

cancer patients often have constitutional insufficiency. Later factors like diet, worry/anger/stress, fatigue, and radiotherapy/chemotherapy damage the spleen and stomach, leading to inadequate generation of qi and blood. Consequently, the lung loses its nourishment. Prolonged lung qi deficiency leads to “the child stealing from the mother,” forming dual deficiency of lung and spleen. Impaired spleen transformation of fluids leads to fluid retention forming dampness, dampness accumulation forming rheum, and rheum coagulation forming phlegm. This obstructs the lung’s diffusion and descent functions, impairing its regulation of waterways, further exacerbating phlegm turbidity. This obstructs qi movement, consumes healthy qi, and over time forms cancer toxin.

The lung and spleen jointly assist in the generation and movement of Defensive (Wei) Qi and Gathering (Zong) Qi. Defensive Qi originates from the water and grain essence transformed by the spleen and stomach. After generation, it ascends to the lung. Lung qi diffuses Defensive Qi to the exterior to perform defense, warming, opening, and closing functions. Deficiency of Defensive Qi leads to exterior deficiency failing to secure, impairment of striae opening/closing, loss of warming for internal organs, skin, and muscles. When external pathogens attack the exterior, the striae open excessively, causing susceptibility to external infections, spontaneous sweating, aversion to wind, and aversion to cold. Gathering Qi derives from the clear qi of nature and the grain qi transformed by the spleen. “The lung is the master of qi,” diffusing, descending, and receiving the clear qi of nature. The spleen governs transformation, generating grain essence qi. Gathering Qi “travels the respiratory tract to govern breathing, penetrates the heart and vessels to move qi and blood.” Sufficient Gathering Qi ensures even breathing and smooth qi and blood circulation. Prolonged illness, lung diseases, or spleen-stomach diseases lead to deficiency of Gathering Qi, marked by significant shortness of breath, low voice, impaired heart blood circulation, resulting in palpitations, chest tightness, and weak pulse.

3. Etiology and Pathogenesis of Post-Chemotherapy Lung Cancer

Although the term “lung cancer” does not appear in ancient TCM literature, records of similar symptoms exist. Lung cancer falls under categories such as “lung accumulation,” “resting ben,” “resting accumulation,” “lung obstruction,” “lung gangrene,” and “aggregation lumps” [7]. For example, The Classic of Difficulties • Discussion on Accumulation Diseases of the Five Zang: “The accumulation of the lung is called resting zi... If prolonged and unceasing, it causes chills and fever, panting cough, and swelling obstruction.” Su Wen • Chapter 47: Discussion on Strange Diseases: “Disease with fullness below the hypochondrium and ascending counterflow of qi... the disease is named resting accumulation, which does not impede eating.” Ling Shu • Chapter 4: Pathogenic Qi, Zang and Fu, and Their Manifestations: “The lung pulse... slightly rapid indicates lung cold-heat, lassitude, coughing with blood, drawing pain to the waist, back, and chest.” Su Wen • Chapter 19: The True Organ Theory of the Jade Mechanism: “Large bones withered, large flesh sunken, fullness of qi in the chest, panting with difficulty, internal pain drawing to the shoulder and neck.” These descriptions share

similarities with the main clinical manifestations of lung cancer.

Master of Traditional Chinese Medicine Zhou Zhongying established a diagnostic and treatment system centered on the theory of cancer toxin, throughout the entire process of lung cancer differentiation and treatment. Professor Zhou believes that lung cancer forms under the precondition of insufficient healthy qi in the body, through the gradual accumulation of pathological products such as qi stagnation, blood stasis, phlegm coagulation, and cancer toxin. Among these, cancer toxin is the fundamental pathogenesis of lung cancer [8]. Liu Jiaxiang [13] believes that deficiency in early-stage lung cancer often manifests as lung-spleen qi deficiency or qi-yin deficiency. The existence of these deficiency patterns indicates imbalance of qi and blood and decreased immunity in patients, requiring methods to regulate qi and blood, nourish yin and clear heat, tonify qi and nourish yin to improve quality of life. Based on the physiological and pathological characteristics of the zang-fu organs, Zhu Chaolin believes that “deficiency of healthy qi with toxin accumulation” is the core pathogenesis of lung cancer. The TCM pathogenesis of lung cancer is “deficiency in origin (Ben) and excess in manifestation (Biao),” with lung-spleen qi deficiency as the root (Ben) and accumulation of cancer toxin as the manifestation (Biao). Professor Wang [9] believes that dual deficiency of spleen and lung runs through the entire course of lung cancer. In the Five-Element theory, the spleen is the mother of the lung. Spleen deficiency, “mother disease affecting the child,” leads to lung qi deficiency. Therefore, treatment employs the “Cultivating Earth to Generate Metal” method to support healthy qi and expel pathogens, tonifying the lung and strengthening the spleen.

“Deficiency of healthy qi and excess of pathogenic factors” is the basic pathogenesis of lung cancer, i.e., lung-spleen qi deficiency and internal consumption by cancer toxin. Insufficiency of healthy qi is the internal fundamental factor in tumor formation. Lung cancer mostly occurs in middle-aged and elderly individuals because in advanced age, primordial qi declines, and the qi, blood, yin, and yang of the zang-fu organs are deficient. External factors in tumor formation include tobacco toxin, toxic dust, and chemical drugs. Internal and external factors act on the body, causing excess due to deficiency and deficiency due to excess, leading to intractable disease. Chemotherapy drugs attack the body while fighting the tumor, and their nature is mostly bitter, cold, and harsh, easily damaging the spleen and stomach, exacerbating lung-spleen qi deficiency. This manifests as marked fatigue, profuse sweating, cough, chest tightness and shortness of breath, nausea, vomiting, poor appetite, constipation, abdominal distension, and a series of other symptoms. The spleen and stomach are located in the middle jiao, the pivot of qi movement. Spleen qi deficiency leads to impaired qi movement, allowing pathological products like phlegm and blood stasis to form and obstruct locally. Over time, stagnation transforms into heat. Heat pathogens consume qi and damage yin. Chemotherapy drugs belong to highly toxic agents, with a harsh and drastic nature. Acting on the human body, they further deplete qi and blood, causing yin-yang imbalance, leading to changes in the patient’s TCM constitution [10], forming patterns such as lung-spleen qi deficiency and lung qi-yin deficiency.

4. Treating Post-Chemotherapy Lung Cancer Based on Cultivating Earth to Generate Metal

TCM believes lung cancer is related to factors such as lung-spleen qi deficiency and qi stagnation with blood stasis [11]. Treating lung cancer proceeds from a holistic perspective, employing pattern differentiation and treatment, following the two aspects of treating both the root and the branch. Treating disease seeks the root: Cultivating Earth to Generate Metal, tonifying the lung and strengthening the spleen, supporting healthy qi. Simultaneously, drying dampness and resolving phlegm, dispersing accumulations and masses, removing pathological products, while also considering promoting qi flow. When qi movement is smooth, medicine reaches the disease location, restoring the normal physiological functions of the zang-fu organs.

Shi Shi Mi Lu (Secret Records of the Stone Chamber) states: "The method of treating the lung, direct treatment is very difficult. One should turn to the spleen. When the spleen qi is nourished, Earth will naturally generate Metal." Modern pharmacological research confirms that qi-tonifying and spleen-strengthening can enhance body immunity, inhibit tumor cell proliferation, induce tumor cell apoptosis, and prolong patient survival [12-13]. Pei Tu Sheng Jin Tang (Cultivate Earth to Generate Metal Decoction) is a classic formula for tonifying the spleen and benefiting the stomach. Its ingredients, Huangqi (Astragalus), Dangshen (Codonopsis), Baizhu (Atractylodes macrocephala), Baishao (White Peony), Guizhi (Cinnamon Twig), Fuling (Poria), Shengjiang (Fresh Ginger), Dazao (Jujube), and Gancao (Licorice), used together, jointly achieve the effects of strengthening the spleen and benefiting the lung, tonifying the middle and boosting qi, and dispelling phlegm and unblocking collaterals. Modern pharmacological research indicates [14] that spleen-strengthening and qi-regulating medicines can inhibit cancer cell proliferation, induce cancer cell apoptosis, enhance immune function, and have synergistic effects with tumor chemotherapy. Li Renting [15], when treating middle and advanced stage non-small cell lung cancer, adopted the Cultivating Earth to Generate Metal method focusing on tonifying or regulating the spleen and stomach, dividing into two patterns: lung-spleen qi deficiency type and lung-stomach qi-yin deficiency type. In treatment, he differentiated between sweet-neutral, sweet-warm, and sweet-cool. For those with insufficiency of lung-stomach yin, the sweet-cool method of Cultivating Earth to Generate Metal is suitable. For the qi-yin deficiency type, the focus is on strengthening the spleen and benefiting the stomach, tonifying qi and nourishing yin, employing sweet-neutral and sweet-cool herbs for tonifying qi and nourishing yin. Wang Zhenfei et al. [16] found in experiments that Beishashen (Glehnia) acts on lung cancer cells by increasing the synthesis and secretion of TIMP2, inhibiting the migration and invasion capabilities of lung cancer cells. Maidong (Ophiopogon japonicus) is sweet, slightly bitter, slightly cold, enters the heart, lung, and stomach channels. It nourishes yin, generates fluids, moistens the lung, and clears the heart. It is used for dry cough due to lung dryness, consumptive cough due to yin deficiency, throat impediment and sore throat, thirst due to fluid injury, internal heat wasting-thirst, heart vexation and insomnia, and intestinal dryness constipation. Wang Yilei et

al. [17] found in established in vitro cell experiments that Ophiopogonin B extracted from Maidong inhibits the proliferation of A549 cells; the mechanism may be related to inhibiting the antioxidant pathway Nrf2/HO-1, disrupting the A549 cell antioxidant system, and promoting ferroptosis. Fuling (Poria cocos) is sweet, bland, neutral, enters the heart, lung, spleen, and kidney channels, and has effects such as promoting urination and draining dampness, strengthening the spleen, and calming the mind. Modern pharmacological research shows that Fuling is a type of natural medicine with broad anti-tumor activity and potential. It can affect tumor cell growth, survival, migration, invasion, and metastasis through multiple pathways and mechanisms, thereby achieving the goal of inhibiting tumors [18].

Zhou Zhongying believes cancer toxin is a specific pathogenic factor in lung cancer development, and treatment should also consider resisting cancer and dispelling toxin. Pathological products like phlegm-rheum and static blood obstruct locally over time, giving rise to cancer toxin, forming tangible malignant tumors. After formation, they can also metastasize throughout the body. Therefore, while supporting healthy qi, one should also remove already formed pathological products, selecting herbs for dispelling stasis, resolving phlegm, and dispersing masses, used in small amounts within formulas to avoid damaging healthy qi. Modern research shows that heat-clearing and toxin-resolving Chinese herbs like Baihua Sheshecao (Hedyotis diffusa) and Maozhaoicao (Ranunculus ternatus) have anti-tumor and immune-enhancing effects [19].

"A healthy spleen lies not in tonification but in movement." Purely tonifying herbs are greasy and impede the stomach, easily increasing the body's burden. Su Wen • Chapter 68: The Six Subtleties and Their Purport says: "If entry and exit cease, then the divine mechanism perishes; if ascent and descent stop, then the qi stands isolated and endangered." Thus, ascent, descent, entry, and exit are the foundation of all transformations, the law of qi transformation movement, and the manifestation of life activities. Once the coordination and balance of ascent, descent, entry, and exit are lost, various pathological changes appear; and when ascent, descent, entry, and exit cease, life activities also terminate. The human body is an organic whole. Each zang-fu organ itself performs ascent and descent movements to complete its basic functions, and the ascent-descent movements among the zang-fu organs are mutually assisting, mutually restraining, and mutually generating. Therefore, while tonifying, one should also consider regulating qi movement. When qi movement is smooth, the zang-fu organs function normally, and qi, blood, yin, and yang gradually tend toward balance. Mild qi-moving agents like Chenpi (Citrus peel), Muxiang (Aucklandia), Yujin (Curcuma), and Sharen (Amomum) can be added as adjuvants to the base formula.

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