

Exploring Liver Cancer Treatment Strategies from Multiple Dimensions of Liver Physiology in the Yellow Emperor's Classic of Internal Medicine

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Abstract: *Primary liver cancer is a disease that seriously endangers human health, with high incidence and mortality rates, making its prevention and treatment a global challenge. In traditional Chinese medicine, it is classified under categories such as “hypochondriac pain” and “accumulation”. The Yellow Emperor's Classic of Internal Medicine provides a comprehensive understanding of the physiological attributes of the liver. The liver governs dispersion and regulates qi movement; abnormalities can lead to qi stagnation, blood stasis, and phlegm accumulation; the liver stores blood, regulates blood volume, and controls blood; the liver is yin in nature but uses yang, and maintaining a balance between yin and yang is crucial; the liver has a close relationship with other organs. Based on this, treatment strategies for liver cancer include preventing disease before it occurs, emphasizing prevention before disease onset; strengthening the body's vital energy and expelling pathogenic factors, such as nourishing qi, strengthening the spleen, nourishing the liver and kidneys, nourishing yin to promote fluid production and strengthen the body's vital energy, promoting blood circulation to remove blood stasis, clearing heat and detoxifying, softening hard masses and resolving nodules to expel pathogenic factors; regulating emotions; and adhering to a holistic approach and syndrome differentiation. Integrating traditional Chinese and Western medicine can enhance treatment efficacy.*

Keywords: “Huangdi Neijing”, Liver cancer, Liver physiological function, Treatment strategy, Integrated traditional Chinese and Western medicine.

1. Research Background

Primary liver cancer has a high incidence rate and a high fatality rate. Epidemiological data show that in 2022, there were 866,000 new cases of liver cancer globally, with 759,000 deaths. It is the sixth most common malignant tumor in the world and the third leading cause of cancer-related deaths [1]. In China, primary liver cancer mainly includes three pathological types: hepatocellular carcinoma, intrahepatic bile duct carcinoma, and mixed hepatocellular - cholangiocarcinoma, with approximately 80% being hepatocellular carcinoma. Liver cancer poses a serious threat to human health and imposes a significant burden on society [2]. Despite continuous breakthroughs in targeted therapy, immunotherapy, and other fields, the prevention and treatment of liver cancer remain challenges for China and the world. In traditional Chinese medicine (TCM) classics, there is no precise term to describe primary liver cancer. Based on the clinical symptoms exhibited by primary liver cancer, such as liver area pain, fatigue, abdominal distension, nausea and vomiting, jaundice, and ascites, it can be classified under the TCM categories of “hypochondriac pain,” “accumulation,” and “abdominal fullness.” “When evil invades the foot and the collateral of Shaoyang, it causes hypochondriac pain, coughing, sweating, and restlessness.” This quote originates from “Su Wen·Ci Shi Pian.” The “Neijing” has a comprehensive understanding of the physiological properties of the liver, such as “When discussing yin and yang in the internal organs of the human body, the zang-organs are yin, and the fu-organs are yang. The five zang-organs of the liver, heart, spleen, lungs, and kidneys are all yin.” and “The liver opens to the eyes” (“Su Wen·Jin Yi Zhen Yan Lun”), which highly summarizes the physiological characteristics of the liver as yin in essence and yang in function. This sufficiently

proves that the location of liver diseases in modern medicine corresponds to the liver in TCM [3]. Based on the physiological functions of the liver in the “Huangdi Neijing,” this article explores specific treatment strategies for liver cancer from multiple perspectives, aiming to restore the original meaning of the classics and provide theoretical support and new ideas for clinical prevention and treatment of liver cancer.

2. The Understanding of the Physiology of the Liver in the Yellow Emperor's Classic of Internal Medicine

2.1 The Liver Governs Dispersion and Regulation

The primary function of the liver is to disperse and regulate, indicating its ability to harmonize and unblock qi circulation throughout the body. As mentioned in “Shanghai Tang's Collection of Western Medicine”: “The liver is associated with wood, and as the branches of wood ascend, the roots of wood descend. Because the liver qi can ascend, it can assist in the promotion of heart qi... Because the liver qi can descend, it can assist in the dispersion of kidney qi.” When the liver qi can ascend, it aids in promoting heart qi [4]. When the liver qi is activated, it can assist in dispersing kidney qi. When the liver's dispersing and regulating function is normal, qi circulation throughout the body is smooth, blood and body fluid are distributed normally, emotions are relaxed, and the functions of the five zang-organs and six fu-organs are properly realized. If the liver qi is depressed and the liver loses its dispersing and regulating function, it can lead to disorders in qi circulation throughout the body, resulting in pathological states such as qi stagnation, blood stasis, and phlegm coagulation. Over time, these can lead to the formation of

tumors and accumulations. Liver cancer is often classified under the category of “accumulation syndrome.” The formation of accumulations is due to the invasion of exogenous pathogens or endogenous pathogenic qi into the body, coupled with insufficient vital qi, which cannot overcome the pathogenic qi. The vital qi and pathogenic qi struggle in the zang-organs, resulting in the formation of accumulations [5].

2.2 The Liver Governs the Storage of Blood

“The heart stores the spirit, the lungs store qi, and the liver stores blood...” The “liver storing blood” mentioned in the Yellow Emperor’s Classic of Internal Medicine indicates that the liver plays a crucial role in blood storage and regulation [6]. The functions of the liver not only include storing blood but also involve regulating blood flow and preventing abnormal bleeding. The passage in “Su Wen·Wuzang Chengsheng Pian” (The Book of Five Elements Formation) states: “When a person lies down, blood returns to the liver.” This suggests the blood circulation status of various organs and tissues, and the liver regulates it in a timely manner according to the physiological needs of the body. The body’s demand for blood significantly decreases during sleep or rest, at which point the liver stores blood. When the body is in a working or exercising state, blood is transported from the liver to the meridians, enhancing the nourishing effect on the organs, tissues, and vessels throughout the body, thereby maintaining the corresponding functions of various organs and tissues. When the body is in a working or exercising state, blood is transported from the liver to the meridians, thus maintaining the corresponding functions of various organs and tissues [7]. In addition to regulating blood volume, the liver also has the function of regulating blood flow, ensuring that blood in the meridians does not overflow and run, thereby preventing bleeding. If the liver’s function of storing blood is impaired, it may lead to various bleeding disorders, such as hematemesis, epistaxis (nosebleed), hematochezia (bloody stool), and menorrhagia (excessive menstrual bleeding). The occurrence of these bleeding disorders is closely related to the disruption of the liver’s function of storing blood.

2.3 The Liver is Yin in Nature but Yang in Function

The liver is yin in essence and yang in function, meaning that the fundamental attribute of the liver is yin, while its functional characteristics are yang. The liver is responsible for storing blood, which is classified as yin in traditional Chinese medicine theory. Therefore, the essential attribute of the liver is defined as yin [8]. At the same time, the liver is also responsible for regulating emotions and promoting qi and blood circulation. These functions tend to have positive and upward characteristics, and are therefore classified as yang. The yin nature and yang function of the liver are interdependent and mutually restraining, jointly maintaining the healthy state of the liver. When the yin nature of the liver is damaged, it may lead to excessive activity of its yang function, manifested as symptoms such as dizziness, blurred vision, and irritability. Conversely, if the yang function is too strong, it may also damage the yin nature of the liver, leading to yin fluid deficiency. This yin-yang balance is crucial for maintaining the health of the liver. Once this balance is disrupted, it may lead to various health problems, affecting

the normal functioning of the body [9].

2.4 The Relationship between the Liver and Other Organs

The liver has a close connection with various organs such as the heart, spleen, lungs, and kidneys. The relationship between the liver and the heart manifests in the regulation of emotions. When the liver’s function is impaired, it may cause emotional instability, which in turn affects the heart’s function, leading to fluctuations in mood. In addition, the dispersing and regulating function of the liver aids in the transformation of food and the absorption of nutrients to some extent [10]. The relationship between the liver and the lungs is mainly reflected in the ascending and descending of qi. The normal dispersing and regulating of liver qi helps the descent of lung qi. The relationship between the liver and the kidneys is manifested in the generation and storage of essence and blood. The liver is responsible for the storage of blood, while the kidneys are responsible for the storage of essence and qi. Both are interdependent and work together to maintain the health and balance of the body [11].

3. Treatment Strategy for Liver Cancer

3.1 Preventive Treatment of Diseases

“Preventive treatment of diseases” is an important therapeutic concept in the “Huangdi Neijing” (Yellow Emperor’s Classic of Internal Medicine). Its core principles include preventing diseases before they occur, preventing disease progression once a disease has occurred, and preventing relapse after recovery [12]. As stated in “Danxi Xinfu - Treating Preventive Diseases Instead of Treating Terminal Diseases”, “It is better to nourish oneself before illness than to seek treatment after illness,” emphasizing the importance of self-protection when healthy. Actively taking preventive measures to prevent the occurrence of diseases embodies the principle of preventing disease progression. This requires people to focus on health preservation and wellness, enhance their physical fitness, and improve their body’s resistance to diseases. Specifically, it means maintaining a good mood and preventing excessive excitement; maintaining a balanced diet, with reasonable dietary combinations, and avoiding excessive consumption of rich, sweet, and moldy foods; maintaining regular daily routines, balancing work and rest, and getting sufficient sleep; and exercising moderately to strengthen the body. At the same time, for the prevention and modification of existing diseases, as well as potential precancerous lesions, regular physical examinations should be conducted for early detection and treatment. Once diagnosed with liver cancer, active treatment is necessary to prevent further deterioration and metastasis of the disease. During treatment, the treatment plan should be adjusted accordingly based on changes in the condition. At the same time, attention should be paid to nourishing vital qi to avoid excessive treatment that may damage vital qi. Vital qi is the fundamental force for the human body to resist diseases. In the treatment of liver cancer, excessive use of chemotherapy, radiotherapy, and other methods may damage the body’s vital qi, leading to physical weakness and decreased immunity, which is detrimental to controlling the disease. Therefore, in the treatment of liver cancer, while eliminating pathogenic factors, attention should be paid to nourishing vital qi. The integration of traditional Chinese and

Western medicine should be adopted to improve treatment efficacy and enhance patients' quality of life.

3.2 Strengthening the Body's Vital Energy and Eliminating Pathogenic Factors

3.2.1 Straightening

"Strengthening the body's vital energy" refers to enhancing the body's immunity and resistance, with the main focus on strengthening the body's vital energy. Methods such as replenishing qi, nourishing blood, nourishing yin, and warming yang can be employed, tailored to the specific condition of liver cancer patients, to achieve effects such as strengthening the body's vital energy. Strengthening the body's vital energy can improve patients' quality of life, prolong their survival time, and create favorable conditions for eliminating pathogenic factors [13].

3.2.2 Tonifying qi and strengthening spleen

The spleen and stomach are the source of qi and blood transformation, and constitute the acquired foundation. Patients with liver cancer often suffer from poor appetite, fatigue, and weight loss, which are caused by impaired spleen and stomach function. Therefore, nourishing qi and strengthening the spleen is one of the important means to strengthen the body's resistance and treat the disease. Commonly used herbs include ginseng, astragalus, *atractylodes macrocephala*, *poria cocos*, and yam. Ginseng can greatly replenish vital energy, restore pulse and prevent collapse, nourish the spleen and lungs, promote the production of body fluid and nourish blood, calm the nerves and improve intelligence, and has a good promoting effect on health; astragalus has the effects of nourishing qi, raising yang, strengthening the exterior to stop sweating, promoting diuresis and reducing swelling; *atractylodes macrocephala* has the effects of strengthening the spleen and nourishing qi, drying dampness and promoting diuresis, stopping sweating and calming the fetus; *poria cocos* promotes diuresis, can remove dampness and strengthen the spleen, calm the nerves and soothe the mind; yam has the effects of nourishing the spleen and stomach, promoting the production of body fluid and nourishing the lungs, nourishing the kidneys and astringing semen.

3.2.3 Nourishing the liver and kidneys

The liver and kidney are homologous, and deficiency of liver yin is often accompanied by deficiency of kidney yin. Nourishing the liver and kidney, and strengthening the liver body, can also enhance the physiological function of the liver. Common herbs include: wolfberry fruit, *fructus ligustri lucidi*, *eclipta alba*, *cornus officinalis*, and *rehmannia glutinosa*, which are widely used in medicine. Wolfberry fruit can nourish the liver and kidney, and improve vision; *fructus ligustri lucidi* helps nourish the liver and kidney, brighten the eyes, and blacken hair; *eclipta alba* has the effect of nourishing the liver and kidney, cooling and hemostasis; *cornus officinalis* can nourish the liver and kidney, astringe and prevent shedding; *rehmannia glutinosa* has significant effects in nourishing blood and yin, enhancing energy, and filling the bone marrow.

3.2.4 Nourishing Yin and generating body fluid

Yin deficiency leads to fluid depletion, and patients with liver cancer may experience a lack of yin fluid during the disease process. Nourishing yin and promoting fluid production can replenish yin fluid in the body, alleviating symptoms such as dry mouth, dry throat, red tongue with sparse coating, and so on. Commonly used herbs include *Adenophora*, *Ophiopogon japonicus*, *Polygonatum odoratum*, and *Dendrobium*. *Adenophora* nourishes yin, clears heat, moistens the lungs, and reduces phlegm, benefiting the stomach and promoting fluid production; *Ophiopogon japonicus* nourishes yin, promotes fluid production, moistens the lungs, and clears the heart; *Polygonatum odoratum* nourishes yin, moistens dryness, promotes fluid production, and quenches thirst; *Dendrobium* nourishes the stomach, promotes fluid production, and nourishes yin, clearing heat.

3.3 Removing Pathogenic Factors

Eliminating pathogenic factors aims to inhibit the growth and development of tumors by removing pathogenic qi. Based on the different stages and pathological characteristics of liver cancer, methods such as promoting blood circulation to remove blood stasis, clearing heat and detoxifying, and softening hard masses and resolving nodules can be employed for pathogenic factor elimination therapy. This therapy can be targeted according to the different stages and pathological characteristics of liver cancer. During pathogenic factor elimination therapy, attention should be paid to eliminating pathogenic qi without damaging vital qi, to avoid overtreatment. For example, poor blood circulation in liver cancer patients can be improved through promoting blood circulation to remove blood stasis, commonly using drugs such as *Salvia miltiorrhiza*, *Ligusticum chuanxiong*, Peach kernel, and Safflower. Clearing heat and detoxifying methods can also be used to combat tumors caused by heat-toxin pathogenic qi, commonly using drugs such as *Oldenlandia diffusa*, *Scutellaria barbata*, and *Sophora flavescens* [14]. Softening hard masses and resolving nodules methods can soften and dissipate tumors, commonly using drugs such as Oyster, Turtle shell, and Seaweed. In summary, during pathogenic factor elimination therapy, treatment methods and drugs should be reasonably selected according to the specific situation of the patient, and the patient's vital qi condition should be constantly monitored to ensure that tumor growth and development are inhibited without damaging the patient's bodily functions.

3.4 Emotional Regulation and Nurturing

The Yellow Emperor's Classic of Internal Medicine emphasizes that "keeping the mind calm, how can one be ill?" This fully illustrates the crucial role of emotional factors in the occurrence and development of liver cancer [15]. Adverse emotional states, such as excessive anxiety, depression, anger, etc., may affect the qi movement in the human body, leading to dysfunction of the internal organs. In patients with liver cancer, adverse emotions may further exacerbate the condition, affecting treatment efficacy and quality of life. Therefore, one of the important aspects of liver cancer treatment is emotional regulation. Through psychological counseling, music therapy, qigong therapy, and other means,

helping patients alleviate negative emotions, build confidence in overcoming the disease, and maintain a good mood can be beneficial for recovery.

4. Holistic Concept and Syndrome Differentiation and Treatment

Liver cancer is a systemic disease closely related to the overall functional status of the human body. Therefore, when treating liver cancer, a holistic approach should be adopted, viewing the patient as an organic whole. Factors such as the patient's physical condition, psychological state, and living environment should be comprehensively considered to develop a personalized treatment plan. At the same time, attention should be paid to adjusting the patient's overall functional status, enhancing immune function, improving resistance, and promoting the body's self-repair ability.

Integrating traditional Chinese and Western medicine in the treatment of liver cancer can leverage the strengths of both medical systems and enhance treatment outcomes. Based on modern medical treatments (such as surgery, chemotherapy, radiotherapy, etc.), supplemented with traditional Chinese medicine (TCM) therapies like soothing the liver and relieving depression, and promoting blood circulation to remove blood stasis, it helps improve patients' overall condition and enhance their quality of life. For instance, during chemotherapy, TCM can alleviate side effects such as nausea, vomiting, and leukopenia by strengthening the spleen and stomach, nourishing qi and blood, etc. Before and after surgery, TCM can accelerate patients' recovery by regulating qi and blood, promoting wound healing, and other methods. Additionally, TCM's treatment based on syndrome differentiation allows for personalized treatment according to individual differences, better meeting patients' needs.

5. Conclusion

In the context where most Western medical disease names can only be classified under certain traditional Chinese medicine (TCM) disease categories, without achieving a one-to-one mapping, the advantage of TCM in accurately treating diseases through disease location identification has become increasingly prominent. Liver cancer, as one of the intractable diseases, is located in the liver in TCM. Previous research and practice have shown that treating liver cancer from the perspective of liver visceral manifestation has significant clinical efficacy [16]. Based on the physiological function of the liver in the Yellow Emperor's Classic of Internal Medicine, and under the general treatment principle of strengthening the body's vital energy and eliminating pathogenic factors, with the goal of maintaining balance, this article deeply explores specific liver-treating strategies for liver cancer treatment based on multiple temporal dimensions. It provides theoretical support for treating primary liver cancer from the perspective of the liver and offers new ideas for the specific clinical differentiation and treatment of primary liver cancer. The Yellow Emperor's Classic of Internal Medicine has always been regarded as a benchmark by medical practitioners and is of great significance for the clinical diagnosis and treatment of modern diseases. We should return to the original meaning of the classics, grasp the pulse of combining classical ancient books with modern

research, and explore its guiding value for modern diseases, in order to better guide the clinical practice of treating intractable diseases such as primary liver malignancies.

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