Therapy Response of Chinese Herbal Medicine in Advanced Liver Cancer: A Retrospective Observational Clinical Trial

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Abstract: Aiming at starting the ball rolling and contributing humble effort to promote CTM (Chinese traditional medicine), we performed the present study to assess the therapy response of Chinese herbal decoction compared to conventional therapy on critical ill patients of advanced liver cancer. A total of 6 patients (1 female and 5 males) with histologically confirmed liver cancer were included in this retrospective observational clinical trial. We administered Chinese medicine (Gan Decoction, mixed with a variety of effective herbal components) to help them to recover from poor condition. In the meantime, conventional treatment of surgical resection and artery catheterization chemotherapy was applied in cases compared. In 3 cases of CTM combined treatment, the tumor marker level decreased. Residual intrahepatic metastatic sites reduced according to ultrasonography/CT imaging, and the patients felt free from the complaint of abdominal discomfort. The quality of life has been improved, we managed to have prolonged the PFS (Progression-Free-Survival) and TTP (Time-to-Progression) from the onset to date. While in 3 cases with conventional treatment only of surgical resection and artery catheterization chemotherapy, we were not able to decrease the level of tumor marker, metastatic lesions increased according to ultrasonography/CT imaging, and the patient's condition worsen more. We failed in having prolonged the PFS and TTP in the compared cases of conventional treatment only. The retrospective clinical study showed no OS (overall survival) benefit for liver cancer patients treated with Gan Decoction, while the QOL (quality of life) evaluation seemed to predict survival better. Chinese herbs might be an additional choice with its better benefits and tolerability in the treatment of primary liver cancer.

Key words: Advanced liver cancer, therapy response, Chinese medicine.

1. Introduction

Primary liver cancer is one of most common

malignant tumor in China, with its mortality listed 3rd among the digestive system malignant tumors [1]. Serum AFP detection combined with ultrasonography could confirm the diagnosis of primary liver cancer in clinical stage [2]. The incidence of primary liver cancer has increased because of the reduced mortality resulting from improved treatments and the development of advanced tools for the early detection of cancerous lesions. Data released by China Cancer Research Foundation showed that about 110,000 people died of primary liver cancer each year in China,

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accounting for 45% of overall mortality rate in the world [3]. Among these, most of primary liver cancer is accompanied with Chronic B-related Hepatitis, whose prognosis is dismay in one disaster after another. Primary liver cancer might be the first leading cause of death from cancer in China [4].

Thus, more critical ill patients with advanced hepatic cancer are now encountered. More and more evidence showed that individual heterogeneity might induce distinguished therapy response. Tumor heterogeneity is a major obstacle for developing effective anti-cancer treatments. Recent studies suggested large stochastic genetic heterogeneity within cancer lesions, where no pattern seems to exist that would enable a more structured targeted therapy approach [5]. Efforts to develop more effective drugs for therapy on critical ill patients of advanced liver cancer have been intensified.

Chinese medicine is a medical system that is capable of treating a very wide range of conditions. Together with acupuncture, massage, and food cures, they form the four distinct methods of treatment in Chinese traditional medicine (also known as CTM). Today, CTM still plays a major part of health care in China, and is provided in state hospitals alongside with Western medicine. Yet there are basic differences between Western medicine and CTM [6].

It has become an indisputable fact that the treatment of primary liver cancer in advanced stage is characterized by poor clinical efficacy and adverse outcome, and the therapeutic efficacy of the combination treatment of CTM and western medicine for this critical ill is to be further evaluated by the evidence-based medicine [7]. Currently, the treatment of CTM for the advanced primary liver cancer has rarely been reported [8]. Hence, aiming at starting the ball rolling and contributing humble effort to promote Chinese traditional medicine, we performed the present study to assess the therapy response of Chinese herbal decoction compared to conventional therapy on critical ill patients of advanced liver cancer,

which showed distinguished liver cancer progression and heterogeneity with individual therapy response.

2. Material and Methods

2.1 Patients

This retrospective study recruited consecutive patients hospitalized in department of oncology, Nanjing 1st Hospital, Nanjing Medical University between April 2008 and Dec 2013, including resectable and unresectable patients with primary liver cancer. A total of 6 patients (1 female and 5 males) of advanced liver cancer were included in this retrospective observational clinical trial. According to clinical trial scheme approved by Provincial Bureau of traditional Chinese Medicine, Nanjing, China (No. YB2015071), we decided a priori to include 6 patients as the following criteria (each with 2 cases): 1) recurrence after surgical resection; 2) progression after surgical resection and subsequent artery catheterization chemotherapy; 3) advanced stage once diagnosis confirmed from onset. The Nanjing Medical University Ethics Committee approved the study and waived the requirement for informed consent, because this was an observational study and all laboratory indices observed were commonly measured for all patients in department of oncology.

2.2 Clinical Method

Serum AFP detection combined with ultrasonography/CT confirmed the diagnosis of primary liver cancer in advanced stage. Above 6 patients were then divided into two groups. One received conventional therapy only and the other was combined with CTM (Gan Decoction, mixed a variety of effective herbal components, Fig. 1), all of those underwent no target therapy such as the kinase inhibitor of sorafenib.

2.3 Gan Decoction (Warm and Removing Prescription)

2.4 Prescription Analysis of Decoction

Unit: gram

1	Dangshen	10g/	1.5
2	Medicated leaven	10g/	1.5
3	Coke hawthorn	10g/	1.5
4	Root of 3-nerved spicebush	10g/	1
5	Roasted rhizoma atractylodis macrocephalae	10g/	1
6	Poria cocos	10g/	3
7	Plantain seed	10g/	3
8	Buckeye seed	10g/	3
9	Fineleaf schizonepeta herb	10g/	1
10	Agilawood	10g/	1.2
11	Dalbergia wood	10g/	1.5
12	Cassia twig	10g/	0.7
13	Radix salviae miltiorrhizae	10g/	1.5
14	Radix pseudostellariae	10g/	1.2
15	Chinese thorowax root	10g/	1.2
16	Curcuma aromatic	10g/	1
17	Ophiopogon root	10g/	1.5
18	Eucommia ulmoids	10g/	0.8
19	Fructus corni	10g/	1.2
20	Dried ginger	10g/	0.5

Fig. 1 Sig: decoct medicinal herbs in 300 ml water per day, 150ml, bid (9:00/am, 3:00 pm).

The prescription is mainly warm and has auxilliary function of transforming. Combination of these herbal components will get better efficacy, as it can completely clean out sputum and stasis, remove pathogens. Among the listed Chinese herbals, cassia twig has effect in activating Yang and warming channels. Drinking it with water to promote Yang; Dried ginger is warm. Removing coldness and unblocking channels are its work; Poria cocos prevents production of sputum, while plantain seed gets rid of moistening; Once sputum is produced, medicated leaven will play its role to fade it away. All tangible stasis can be transformed with hawthorn. Dangshen supplements Qi so that all lingering illnesses are to be removed. Rhizoma atractylodis macrocephalae is often used to invigorate spleen and supplement Qi, clear damp and promote diuresis. Combination of Dangshen with Rhizoma atractylodis macrocephalae makes warming and transforming

better. The root of 3-nerved spicebush, agilawood, dalbergia wood and buckeye seed have common effect in clearing and warming liver, smoothing Qi and removing coldness. Fineleaf schizonepeta herb has warm characteristic and refreshing fragrance. It can distinguish stagnated heat in blood and wipe out body dampness, and has great contribution to whole body health. Both radix salviae miltiorrhizae and curcuma aromatica can eliminate stasis in liver and channels to clear liver and unblock blood vessel. Eucommia ulmoids and fructus corni have function of warming liver and nourishing kidney. Strong kidney will make liver strong as there is an old saying in Chinese traditional medical science that kidney is the mother of liver. Radix pseudostellariae supplements lung Qi, however, ophiopogon root protects lung Yin. Lung guides the Qi of the whole body. If lung Qi is vigorous, the Qi of organs will be vigorous also. Vital essence of human body forever exists as the Qi does

not fade away.

3. Results

3.1 CTM Group

3.1.1 Case 1 (Advanced Stage Once Diagnosis Confirmed from Onset)

A 63-year-old Chinese man with a chronic B-related hepatitis history was presented to a local neighborhood clinic because of an abnormal mass in his right lobe of liver seen on an ultrasonography taken during an annual medical checkup. On B-mode ultrasound, several inhomogeneous hypo-echoic area was shown with the largest one ($16 \times 18\text{mm}$). An abdominal CT (computed tomography) scan demonstrated sporadic intrahepatic metastatic lesions with irregular border and spiculated formation in his right liver which had enlarged hepatic hilar and abdominal LNs (lymphnodes) in Dec 2012. Conventional laboratory test of tumor marker showed serum AFP (alpha feto protein) was 74.77ng/ml . Since then, he kept feeling right upper abdomen ache, hypokinesia of left lower limb, weakness and fatigue, and those symptoms went from bad to worse. Clinical confirmation of advanced primary liver cancer ($T_4N_2M_0$) was determined on the basis of the available Chinese clinical practice guidelines in oncology [8]. Subsequent artery catheterization chemotherapy was recommended because of miffing opportunity for radical surgical resection. However, the patient himself was reluctant to accept chemotherapy. The kinase inhibitor of sorafenib was not chosen as a treatment option due to financial problem. In accordance with our patient's request, we administered Chinese herbal medicine of Gan Decoction to help him to recover from the poor condition.

After 3 months of Chinese traditional treatment with Gan decoction, the tumor marker level dramatically decreased (AFP: $77.47 \rightarrow 2.63 \text{ ng/ml}$). Both intrahepatic lesions and metastatic abdominal LNs reduced in size, and judged as PR (partial

response) using the Response of Evaluation Criteria in Solid Tumors criteria, with the patient feeling free from the complaint of abdominal discomfort and recover from hypokinesia.

Along with this favorable outcome, our patient received a further modified Chinese herbal medicine based on Gan Decoction. However, the treatment was successfully administered in the case of primary liver cancer. CT imaging and ultrasonography revealed no regrowth of intrahepatic invasion and reduced abdominal LNs (Fig. 2), resulting in complete response with a 9-month progression-free survival. The tumor marker of AFP decreased to the normal range, and the quality of life has been greatly improved.

So the patient received a further maintenance monotherapy with Chinese herbal medicine modified on the basis of Gan Decoction. A follow-up was scheduled with his outpatient service doctor every 6 month, including interval history, physical examination, conventional laboratory test, determination of tumor markers, CT and ultrasonography. Follow-up results showed that the tumor marker of AFP level finally came back to the normal range. Yet it came as a surprise to find an effect of diminishing the hepatic lesions by CT, and perfectly normal liver imaging. Our patient is still alive 15 months after diagnosis, and further Chinese traditional treatment is planned including both decoction and powder for oral taking. We managed to have prolonged the PFS (Progression-Free-Survival) and TTP (Time-to-Progression) from the onset to date.

3.1.2 Case 2 (Recurrence after Surgical Resection)

A 53-year-old Chinese man with a chronic B-related hepatitis history was presented to a local neighborhood clinic because of an abnormal mass in his right lobe of liver on a B-mode ultrasonography taken during an annual medical checkup. An abdominal CT (computed tomography) scan demonstrated right lobar mass of liver with the size of $52 \times 36\text{mm}$, which had elevated level of serum AFP of

Fig. 2 Ultrasonography before and after CTM.

302.9 ng/ml, suggesting primary liver cancer in Apr 2008. He was subsequently referred to local hospital for right lobe tumor (VII, VIII) resection and cholecystectomy on May, 2008. Microscopic examination of the removal specimens showed hepatic cell carcinoma, grade 2-3, with tumor size of 52×36 mm, cirrhosis and interstitial chronic inflammation, accompanied by edema and steatosis liver cells. Postoperative recovery is well, subsequent artery catheterization chemotherapy was recommended and the patient himself was reluctant to accept chemotherapy. The kinase inhibitor sorafenib was not chosen as a treatment option due to financial problem. By the end of 2009, he began to complain of abdominal pain, indigestion, sweating, insomnia, weakness and fatigue, etc. and those symptoms went from bad to worse. So this patient was referred to our medical college and hospitalized in the oncology department in Dec, 2009. Conventional laboratory data showed iron deficiency anemia and elevated levels of AFP. Systemic evaluation, including ultrasonography and CT imaging, showed evidence of recurrent liver cancerous lesions. Assessment of tumor status and health condition was judged as being an inappropriate case for artery catheterization chemotherapy. In accordance with our patient's request, he received the treatment of Chinese herbal medicine (Gan Decoction, modified on the basis of

warm and removing prescription) to get far better benefits and tolerability.

Since taking our Chinese herbal decoction, the tumor marker gradually decreased. Hepatic recurrent lesions reduced in size. Ultrasonography showed solitary mass in right hepatic lobar with 8×7 mm in May of 2012, and judged as SD (stable disease) using the Response of Evaluation Criteria in Solid Tumors criteria. The patient felt free from the complaint of abdominal discomfort. Along with this favorable outcome, our patient received a further treatment on the basis of above Chinese medical prescription.

However, the treatment was successfully administered in this case of recurrent hepatic cancer. By the time of Apr of 2013, Ultrasonography and PET-CT revealed no regrowth of hepatic lesion, suggesting CR (complete response) with a 19-month progression-free survival. The tumor marker decreased to the normal range, and the quality of life has been greatly improved.

A follow-up was scheduled with his outpatient service doctor every 3 month. Our patient is still alive more than 5 years after diagnosis of primary liver cancer, so the patient received a further maintenance monotherapy with Chinese herbal medicine. We managed to have prolonged the PFS and TTP from the onset to date.

3.1.3 Case 3 (Progression after Postoperative Artery Catheterization Chemotherapy)

A 65-year-old Chinese man with a chronic B-related hepatitis history was presented to a local neighborhood clinic because of abnormal tumor marker and hepatic neoplasia during a routine medical checkup. Conventional laboratory data showed: AFP (alpha feto protein) 4.7 ng/ml and CA19-9 (carbohydrate antigen 19-9) 82.03 U/L. CT scan demonstrated a solitary mass (51×40 mm) with an irregular border and a spiculated formation in his right lobe of liver, suggesting primary liver cancer in Dec 2011. He was subsequently referred to local hospital for a radical surgical resection of his right liver cancer

in Jan, 2012. Pathological examination showed hepatic cell carcinoma, tumor size of 51×40 mm and cut edge of liver cirrhosis. Postoperative artery catheterization chemotherapy was administered. By the time of March of 2013, he began to complain of abdominal discomfort, weakness and fatigue, etc, and those symptoms went from bad to worse. Ultrasonography showed intrahepatic inhomogeneous hypo echoic area. Conventional laboratory data showed partial liver function failure and elevated levels of carbohydrate antigen (CA19-9). Upon diagnosis it was confirmed as recurrent HCC (hepatic cell carcinoma). Assessment of artery catheterization chemotherapy was judged as being an inappropriate case, due to its dismay therapy effect. The kinase inhibitor sorafenib was not chosen as a treatment option due to financial problem. So the patient received the treatment of Chinese herbal medicine (Gan Decoction, modified on the basis of warm and removing prescription) to recover from poor condition.

After 2 months of Chinese traditional treatment, the tumor marker of CA19-9 decreased. Recurrent intrahepatic lesions reduced in number and size (Fig. 3), and judged as SD (stable disease) using the Response of Evaluation Criteria in Solid Tumors criteria, with the patient feeling free from the complaint of abdominal discomfort. Along with this favorable outcome, our patient received a further Chinese herbal medicine. Later CT scan imaging revealed no regrowth of hepatic lesion, and the tumor marker (AFP, CA19-9) came back to the normal range, resulting in stable disease with a 11-month progression-free survival, and the quality of life has been greatly improved. So the patient received a further maintenance monotherapy with Chinese herbal medicine. A follow-up was scheduled with his outpatient service doctor every 3 months, including interval history, physical examination, conventional

Feb, 2013

Apr, 2013

Fig. 3 DSA (Digital Subtraction Angiography) before and after CTM.

laboratory test, determination of tumor markers, ultrasonography and CT. Follow-up results showed that our patient is still alive 2 years after diagnosis, and further Chinese traditional treatment is planned including both decoction and powder for oral taking. We succeeded in prolonging the PFS and TTP.

3.2 Conventional Therapy Group

3.2.1 Case 1 (Advanced Stage Once Diagnosis Confirmed from Onset)

A 30-year-old Chinese woman was presented to a local neighborhood clinic because of an abnormal mass in his right lobe of liver seen on an ultrasonography taken after pregnancy. Both CT and B-mode ultrasound scan demonstrated multiple lesions with irregular border and spiculated formation in her whole liver which had enlarged hepatic hilar and abdominal metastasis in March 2013. Determination of tumor marker showed serum AFP was 1263.6 ng/ml. Since then, she kept complaining about severe abdominal pain, distension and constipation, nausea, difficulty in breathing, weakness and fatigue, and those symptoms went from bad to worse. Clinical confirmation of advanced primary liver cancer ($T_4N_2M_1$) was determined. Subsequent artery catheterization chemotherapy was recommended because of mulling opportunity for radical surgical resection. However, the patient's

condition was too poor to accept chemotherapy. The kinase inhibitor of sorafenib was not chosen as a treatment option due to financial problem. So, we administered conventional support treatment to help her to release discomfort. Unfortunately, 3 months later, the tumor marker level increased rapidly and indices of liver function failed. Both intrahepatic lesions and metastatic abdominal metastasis progressed. Along with this disaster outcome, our patient died even we administered best support care and therapy. The OS (overall survival) was only 3 months or so from the onset.

3.2.2 Case 2 (Recurrence after Surgical Resection)

A 54-year-old Chinese man with a chronic B-related hepatitis history was presented to a local neighborhood clinic because of abnormal tumor marker and hepatic neoplasia during a routine medical checkup. Conventional laboratory data showed: AFP 244.6 ng/ml. CT scan demonstrated a solitary mass (49 × 38 mm) with an irregular border and a spiculated formation in his right lobe of liver, suggesting primary liver cancer in March 2012. He was subsequently referred to our hospital for a radical surgical resection of his right liver cancer in Apr 2012. Pathological examination showed hepatic cell carcinoma and cut edge of liver cirrhosis.

Subsequent artery catheterization chemotherapy was recommended and the patient himself was reluctant to accept chemotherapy. The kinase inhibitor sorafenib was not chosen as a treatment option due to financial problem. By the end of 2012, he began to complain of abdominal pain, distension, accompanied with obstructive jaundice and ascites, and the patient's condition went from bad to worse. So he was referred to our medical college and hospitalized in department of oncology in Jan, 2013. Conventional laboratory data showed iron deficiency anemia and elevated levels of AFP. Systemic evaluation, including ultrasonography and CT imaging, showed evidence of recurrent liver cancerous lesions. Assessment of tumor status and health condition was judged as being an

inappropriate case for artery catheterization chemotherapy. In accordance with our patient's request, he received the support treatment of to improve his condition. Regretfully, our patient died two months after hospitalization, so the patient's TTP and PFS had not be prolonged.

3.2.3 Case 3 (Progression after Postoperative Artery Catheterization Chemotherapy)

A 54-year-old Chinese man with a chronic B-related hepatitis history was presented to a local neighborhood clinic because of an abnormal mass in his right lobe of liver on a B-mode ultrasonography taken during an annual medical checkup. CT scan demonstrated right lobar mass of liver with the size of 41 × 25 mm, which had elevated level of serum AFP of 201.8 ng/ml, suggesting primary liver cancer in Sep 2012. He was subsequently referred to local hospital for right lobe tumor resection. Pathology showed hepatic cell carcinoma. Postoperative artery catheterization chemotherapy was administered. By the time of Aug of 2013, he began to be constantly tormented with headache. CT showed intracranial lesions. Conventional laboratory data showed liver function failure and elevated levels of AFP. Upon diagnosis it was confirmed as advanced liver cancer. Assessment of the kinase inhibitor was judged as being an inappropriate case. So the patient had to be received the salvage treatment of BSC (best support care). After 2 months of BSC, the patient died, resulting in PD disease with a 13-month OS,

4. Discussion

Most of Chinese liver cancer patients have a chronic B-related hepatitis history, among whom more than a third are diagnosed of cirrhosis [9]. So, China is located in the high area of primary liver cancer, the incidence has been increasing significantly in recent years [10]. Those therapeutic effect and prognosis of recurrent or metastatic liver cancer is far from satisfactory.

Our patients reported could obtain a benefit with the

help of Chinese medicine, including 9 months PFS of CTM only, 19 months PFS of CTM plus surgery and 11 months PFS of CTM combined surgery and artery catheterization chemotherapy. Each case showed distinguished liver cancer progression and heterogeneity with individual therapy response. We managed to have prolonged PFS and TTP (Fig. 4).

Provided significant heterogeneity of tumor cells, only a very small amount of hyperplasia of tumorigenicity subsets with an infinite potential, and are resistant to chemotherapy drugs, they served as the role of stem cells in the tumor, and start to play a key role in tumor formation and growth. All available treatment is not targeting tumor stem cells, this may be the major causes of clinical treatment failure and relapse. Currently tumor stem cells in liver cancer cells have many characteristics, such as self-renewal, multipotential differentiation, high tumorigenicity and drug resistance, and so on. CTC (circulation tumor cells) may be associated with recurrence of liver cancer. Researchers believe that the liver cancer stem

cells do exist, and may be the target of target therapy of liver cancer [5].

In Chinese traditional medical science (hereinafter CTM), human body is seemed as a small universe and must comply with running rule of the universe simultaneously as nature does. Get up at sunrise and rest at dusk. Play in summer and sleep in winter. Once the rule is reversed, life will be depleted excessively and gets exhausted inevitably and decayed prematurely. Therefore, it is concluded that survival of the fittest is life's basic compliance to the nature.

However, in fact, life always tries its best to develop capability against the nature, such as cactus in desert and bulrush in water. The cactus has sharp leaves, abundant flesh and sufficient water to make it not withered in such bitter environment, and the bulrush is hollow and straight to keep it from rotting.

Currently global warming makes human being gradually adaptable with change of nature. To match with the climate and survive, body has to be transformed to cold physique.

Fig. 4 Cases of primary liver cancer treat with CTM.

Like all other substances in nature, heat physique expresses as exciting, active, energetic, and being afraid of hot, whereas weariness, slowness, weakness and fear of cold are the expressions of cold physique. Although the cold physique matches with nature, it simultaneously provides breeding ground of tumor.

Cold physique is taken as the main cause for formation of liver tumor by TCM as coldness lowers human body activity, slows down metabolism, easily coagulates pathological products to form stasis. Moreover, with negative emotions in routine life such as depression, entanglement, pessimism and so on, the stasis deteriorates. If it goes on like this for long time, coagulated stasis will go bad and decay and finally becomes toxic tumor, which is out of body control and starts to reproduce by itself.

CTM has developed various treatments based on recognition of above mentioned human body activities, and found the most effective is traditional warming concept. Take treatment of liver tumor as example, at first, Chinese herbal medicines which are helpful to improve heat of body (such as cassia twig, dried ginger, tangshen, root of 3-nerved spichbush, rhizoma atracylodes macrocephalae, agilaowwd, eucommia ulmoides, fructus corni, etc) are used to remove coldness in liver, stomach and kidney.

Objective of removing coldness is to: firstly restore detoxification function so that liver can actively take part in restraining growth of tumor, absorbing and digesting the tumor; secondly, improve stomach's absorbing capability to provide body immune system and metabolism sufficient energy and strengthen liver's detoxification auxiliary; thirdly, maintain dewatering function of kidney in order to drain absorbed tumor cells out of body together with urine and stool.

With strength of Chinese herbal medicines' warming and transforming, such 3 organs' function gets restore and body metabolism is improved, therefore, under the circumstance, human body function of purification to tumor cells restores. CTM

has emphasized comprehensively coordinating effect of lung in life since ancient times. Lung limits all functions of liver and keeps them from being out of control (such as tumor transferring or ascites). On the other hand, lung delivers the essence transmitted from spleen and stomach to liver through kidney. That is why there is radix pseudostellariae, ophiopogon root and Dangshen in the prescription.

Method of transforming is adopted to treat formed tumor by CTM. In the prescription, medicated leaven and coke hawthorn can improve function of spleen and stomach so as to soften and melt tangible tumor; Poria cocos and plantain seed can drain withered and melted mass and anywhere intangible tumor cells out of body; Radix salviae miltiorrhizae, curcuma aromatica and fineleaf schizonepeta herb can deal with tumor cells in blood and strength the former two functions.

CTM considers human body as a dynamic platform in which all organs are correlative and bind each other. Relationship among heart, liver, spleen, lung and kidney is like interlinking between mother and son, and runs in cycle as a circle. In treatment of liver cancer, CTM puts emphasis on protecting and restoring liver function. Lung's restraining effect in liver is improved to prevent tumor from transferring. Heat energy supply from kidney to liver is strengthened to restart and restore liver's purification and detoxification. Spleen function is promoted to help liver soften and melt tumor cells (Fig. 5).

Chinese traditional medicine clinical treatment aims to take into consideration a patient's whole condition, including both body and mental condition, rather than confines to the cancer lesion itself [11]. Distinguished prescriptions should be made out to individual patients, so as to increase energy and heighten sense of well-being, reduce the side effect of radiation and chemotherapy, refresh marrow function and improve appetite and sleep [12]. The research of Chinese traditional medicine anti-tumor effect has made great achievements in recent years [13]. It should be guided

Fig. 5 Relationship among heart, liver, spleen, lung and kidney in CTM.

by the theory of Chinese traditional medicine to practice in oncology. With the development of science, it has obtained a new understanding of etiology, pathogenesis, and treatment of the tumor for human beings, who will pay a great deal of attention to the molecular mechanism of the anti-tumor effect in traditional Chinese medicine.

Due to the limited cases, this retrospective clinical study could not show OS benefit for liver cancer patients treated with Gan Decoction, while the QOL evaluation seemed to predict survival better.

Taken together, we may consider that Chinese herbal medicine has greater potential efficacy and lower adverse effects compared with conventional surgical resection, radiation and chemotherapy in the treatment of primary liver cancer, even when it is in advanced stage.

5. Conclusions

In above cases, it had been shown that Chinese herbal medicine played an important role in the therapy of primary liver cancer, which showed distinguished liver cancer progression and heterogeneity with individual therapy response. Chinese herbs might be an additional choice with its better benefits and tolerability in the treatment of primary liver cancer. Thus there is a potential alternative of therapy tailored to individual patient.

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