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On "Diseased Phlegm Drinkers Should Be Treated with Warm Medicine"

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Abstract: The classic quotation "Those who are sick with phlegm and drink should be treated with warm medicine" comes from Zhang Zhongjing's Synopsis of Golden Chamber, which is known as the great treatment of phlegm and drink disease. If we want to use this general rule clinically, we must first understand the difference and connection between "phlegm" and "drink"; Secondly, we should fully understand the meaning of "warm medicine and it"; Finally, clinically, according to the different stages of the patient's disease, it needs to be treated according to the syndrome differentiation. This theory has important guiding significance in the clinical treatment of phlegm-drinking disease.

Key words: Phlegm, Fluid, Warm Medicine, Syndrome Differentiation and Treatment Clinical Experience

Since ancient times, there are many doctors for "sick phlegm drink, when warm medicine and it" have their own opinions, but no matter how we understand this sentence, it is in order to be able to better achieve the purpose of saving people. Although there are different schools of doctors, there are no boundaries in medicine, and different doctors are also learning from each other. On the study of doctors of all dynasties, there have a try about the following analysis.

1. THE MEANING OF "PHLEGM DRINK"

The abnormal distribution and transportation of water in the human body will lead to the accumulation of water and drink in some specific parts, and this kind of disease is called phlegm and drink disease[1]. The "phlegm" mentioned in traditional Chinese medicine refers to the pathogenic factors that can not be seen or touched but can lead to some special diseases and remain in the viscera, tissues, muscles, tunnels, veins and joints of the human body [2]. The first record of phlegm drink was the croton strip "retention of phlegm drink" in Shennong's Herbal Classic, which was called "light drink" in "Mai Jing" and "Qianjin Yifang". Before the Han and Tang Dynasties, it was mostly discussed as drinking, and then it was mostly called phlegm. With the continuous development of medicine in later generations, and under the influence of the fiery theory, the theory of phlegm was slowly established, thus linking water, drinking and phlegm together[3]. "Sputum and fluid" can be seen as a combination of broad sense, narrow sense and pathological changes of

sputum and fluid disease. In Zhongjing Classics, the broad sense of phlegm drink is divided into four categories: narrow sense of phlegm drink, suspended drink, overflow drink and branched drink. Water drinking in the stomach and intestine is called the narrow sense of phlegm drinking, "water flowing through the intestine" is the description of it in the Synopsis of the Golden Chamber. When describing phlegm and drink, the thick and cloudy part is usually called phlegm, and the clear and thin part is called drink. Specifically, it can be understood that sputum not only refers to the visible sputum coughed up, but also may include the diseases similar to phlegm retention: scrofula, sputum nuclei, etc., as well as sputum stagnating in tissues such as the viscera, meridians and collaterals. Fluid refers to the clear liquid that stays in various viscera in the body and fails to discharge.

2. THE FORMATION PROCESS OF PHLEGM AND FLUID

"Golden Chamber Essentials • Phlegm drink Disease" article 12 said: "Husband patients drink too much water, will burst full of panting. If you eat little and drink much, the water will stop the heart, or even palpitation, and the small person will be short of breath." the etiology and pathogenesis of phlegm and fluid were briefly expounded [4]. In normal human physiology, due to the difference of environment and living habits, phlegm and Yin are divided into two kinds of internal and external causes. External because of feeling wind cold, improper diet (excessive drinking, drinking cold water, eating cold), fatigue and other external evils. The disease position of phlegm drink lies in three jiao, lung, spleen and kidney, "lung is the storage of phlegm, spleen is the source of phlegm, kidney deficiency water is phlegm", it can be seen that spleen is the key to cure. The excretion of human water transport is closely related to the three jiao gasification, lung, spleen and kidney function. If the three jiao function is dysfunctional and Yang deficiency is not transported, it will cause the water to stop accumulation. Internal and external evil will cause the coordination of zang-fu and spleen, the upper can not gather qi to transport essence to replenish the spleen and nourish the lung and stomach, and the lower can not gather qi to help the liver and kidney to benefit the gasification of water. Sanjiao waterway dereliction of duty, which is likely to cause drink evil to stop

gathering and overflow the viscera of the human body or directly spread to the five viscera.

3. CLASSIFICATION OF "PHLEGM AND DRINK"

The original text said: "Husband drink four, what is also?" Teacher said: there is phlegm drink, suspension drink, overflow drink, there is a drink. "I asked: Why are the four drinks different? Teacher said: man Sheng this thin, water walk between the intestine, drain sound, called phlegm drink. After drinking water under the side, cough, saliva and pain, called suspended drink. Drinking water popular, ascribed to the limbs, when sweat out and not sweat out, the body pain heavy, called overflow drink, cough back to rest, short-term can not lie its shape such as swelling, called a drink. "In the classic sentence ' sick phlegm, when warm medicine and ', ' phlegm ' actually refers to the broad sense of phlegm or narrow sense of phlegm? What is the difference between ' phlegm ' and ' drink '? Physicians have always had different views. In the Song Dynasty, Yang Renzhai 's ' Renzhai Zhizhi Fanglun ' clearly distinguished phlegm and fluid from the nature and state, that is, phlegm is thick and fluid is clear. Xu Zhongke pointed out from the form: the coagulation is phlegm, and the non-coagulation is drinking. the ' phlegm and drink ' recorded in the ' Jingyue Encyclopedia · phlegm and drink ', although the same kind, but there are different, the sticky is phlegm, the thin is drink, the heat is phlegm, the cold is drink ' also tells the difference between phlegm and drink in detail. You Zaijing pointed out: Valley into the stomach, can not disperse its essence, into phlegm; the water into the spleen, can not lose its gas, then condensed into drink; the essence of ordinary diet, condensed but not cloth, is phlegm; phlegm resides in the middle and drinks are attached to the outside. Chen Fan [5] et al. believed that " phlegm " in the " Synopsis of Prescriptions of the Golden Chamber " was a drink evil, and it was biased towards cold drinks. " Phlegm " was only a modification of " drink. "Liu Sheng [6] and Liu Yuan[7] all believe that "phlegm and fluid retention in disease phlegm and fluid retention " refers to the narrow sense of phlegm and fluid retention, rather than the broad sense of phlegm and fluid retention. There is a saying that is pointed out that Zhongjing in the ' on the flavor of Astragalus and its gas phase ' for the narrow sense of wind cold cough in terms of a kind of curative effect[8] ; some say that this is actually a cough treatment principle [9] first proposed by Zhongjing in the " generalized cough phlegm theory "; There is also an unclear statement that this refers to a broad or narrow sense of cough phlegm, but according to the medical point of view of the full text of this book, we should actually only think that it refers to a narrow sense of phlegm in the full text of an annotation [10] . There are also some doctors who believe that phlegm is actually a nickname for water[11] . Although there are differences between

ancient and modern phlegm, it is not wrong to divide the total into four kinds of phlegm in a broad sense and phlegm in a narrow sense.

4. THE MEANING OF "WARM MEDICINE"

The generation and formation of phlegm drink are mainly due to the weakness or suppression of the yang qi in the human body, the lack of smooth circulation and loss of control, and the inability of qi to generate power. In clinical practice, it is usually used to warm yang and dissipate qi, as it can effectively prevent the generation of water drinks. Therefore, when treating phlegm retention in clinical practice, it is necessary to start from the root. Warming drugs have the function of dispelling cold, opening the pores and wrinkles of the skin, and then achieving the passage of waterways, in order to restore normal water circulation, and ultimately reduce the production and generation of phlegm. As Yu Changzhi, a medical expert in the late Ming and early Qing dynasties, once said, "If the sun shines in the sky, then the haze will disperse. the treatment of phlegm retention is not only limited to warm drugs, but also includes warm formulas [12] . It is not necessary to add the treatment methods of "promoting, dissipating, opening, guiding, and clearing" to the treatment methods based on the different parts and different syndromes of phlegm retention[13] .

The treatment of phlegm retention is not only limited to warm drugs, but also includes warm formulas[5] . Zhongjing's Linggui Zhugan Decoction, Wuling San Wan, Shenqi Pill and other prescriptions for warming yang and removing dampness are often used in clinical prescriptions for treating phlegm retention disease, including warm drugs such as Poria cocos, Cinnamomum cassia, Atractylodes macrocephala, Pinellia ternata, and Ginger, the main treatment core is mainly Poria cocos and Cinnamomum cassia [14] . Guizhi has a pungent and sweet taste, a warm nature, and has the functions of sweating and muscle relieving, warming yang and unblocking the meridians, assisting yang and transforming qi, and calming and lowering qi, in this type of formula, the effects of warming yang and unblocking the meridians, assisting yang and transforming qi are used, which can be used for symptoms such as suppressed yang qi in the human body and loss of qi; Poria cocos has a sweet, light, and flat taste, which is sweet and can strengthen the spleen, Thereby enhancing the ability to transport water and moisture, reducing energy infiltration, and thus enhancing the path of water and moisture removal. The combination of Ling and Gui can not only invigorate the yang qi of the body, develop the meridians, and smooth the waterways, but also enable the evil of phlegm and yin to receive yang to assist in the initial movement, warm medicine to start opening, yang qi to promote the movement of water and liquid, and warm medicine to promote the transformation of yin and evil[15] .

5. THE MEANING OF "HARMONY"

The phrase 'those who suffer from phlegm and drink should be reconciled with warm medicine' reflects and applies the principles and flexibility of the basic theory of modern Chinese medicine syndrome differentiation and treatment[16]. Zhao Jing et al. [17] thought that "and" refers to 'prescription medication as mild as possible, not too warm, too warm'. But this meaning has already been reflected in the word "Wen", and ancient people cherish ink like gold, so this interpretation does not resemble the original meaning of Zhongjing. Some people believe that 'harmony' is the method of promoting harmony, with the meaning of promoting harmony and lowering anxiety[18]. But drinking evil can spread all over the body, and only discussing it from the lower jiao may be too narrow. Even Tang Chuan'an et al. [19] believe that "harmony" seems to have no practical meaning as "main". In Shuowen Jiezi, "He, corresponding" and "Guangya", "He, harmonic" mean that in the clinical treatment of various diseases of phlegm and fluid, due to the different symptoms and types of phlegm and fluid patients, the stage of illness, their own psychological conditions, etc., we can not simply just warm up, so that cold and dampness rise without eliminating phlegm fire. Therefore, we should take "He" as the basis and principle, and properly consider the addition of warm tonics A product for eliminating, opening, and guiding [19]. Meng [20] summarized the treatment of phlegm yin disease into three principles: firstly, treating the spleen as the main treatment, secondly, prioritizing the flow of qi, and thirdly, treating phlegm and blood stasis. As described above, Zhongjing's main treatment methods for phlegm retention are Linggui Shugan Decoction, Shenqi Pill, Xiaoqinglong Decoction, Wuling San Wan, Xiaobanxia Decoction, etc., which treat phlegm retention from various aspects, such as promoting qi, eliminating phlegm, warming yang, and inducing evil from urination.

If the disease is moderate, it will stop, so as to prevent damage to the right, and prevent the recurrence of the disease. the "harmony" in the sentence "warming medicine and harmony" is not only the purpose and principle of Zhongjing's syndrome differentiation and treatment, but also the specific methods and means of his treatment [21]; It is not only considered as the general principle of Zhongjing's treatment of diseases such as phlegm and phlegm, but also the academic basis and criterion for treatment of all diseases such as cough and pneumonia. The main content of Zhongjing's Golden Chamber is the continuous progress of Chinese medical academic theory and the summary of clinical experience before the end of the End of the Han dynasty, at the same time, it is also inseparable from inheriting the excellent traditional culture of the Chinese nation. Zhong Jinghe's ideas are also reflected in classic sayings such as "carefully observing yin and yang, adjusting them according to their location, and maintaining a peaceful period" and

"yin and yang are secret, and the spirit is the cure", which means that the illness should be stopped immediately to prevent harm to the right.

6. CLINICAL EXPERIENCE OF "WARM MEDICINE AND HARMONY"

The Jinkui Yaolue describes the content of phlegm retention disease, and its clinical symptoms are changeable, which is closely related to the causes of chronic obstructive bronchitis, chronic bronchial asthma, heart failure, renal edema and other causes in modern western medicine pharmacology.

Chronic obstructive pulmonary disease (COPD), also known as chronic obstructive pulmonary disease (COPD), is a chronic disease characterized by progressive pulmonary dilation and incomplete and reversible pulmonary developmental disorders with limited airflow. Due to its large number of main patients and relatively high mortality rates, it has gradually developed into an important public health and safety management issue[22]. Traditional Chinese medicine explains that the cause of this disease is often due to the long-term invasion of internal and external pathogens in the lungs, resulting in deficiency of lung qi, loss of circulation, lack of water and fluid distribution, accumulation of phlegm, obstruction of the airway, and occurrence of cough and asthma. Zi Yi originates from the mother qi, and lung diseases damage the spleen. the spleen loses its healthy circulation, the kidney loses its qi, and phlegm turbidity originates from the internal source, which is stored in the lungs, exacerbating the obstruction of lung qi. Over time, if the mother is ill and the child is affected, the gold will not produce water, the kidney qi will be weakened, and the qi will be lost, resulting in the cessation of water intake. If the heart and lungs are dry due to yin deficiency, the breath will be full and the patient will not be able to lie down; Overflow of skin results in heavy edema of the body; In the later stage, if the qi is obstructed and the qi fails to flow, blood stasis in the heart can lead to palpitations and cyanosis. From this, it can be seen that this disease is based on the deficiency of the viscera, the excess of phlegm and yin, the excess of yin and yang, and the excess of yin and yang. Phlegm retention is not only a pathological product, but also a new pathogenic factor, causing acute exacerbation of the condition due to internal and external pathogens. Therefore, the primary treatment for this disease is to warm up yang qi and dissipate phlegm and dissipate yin[23].

Renal disease related skin edema is mainly caused by various renal functional lesions, which can cause skin swelling in the head, face, fingers, limbs, and even the entire body[24]. We can conduct a detailed analysis of the main functions and meanings of taking warm medicine from two aspects. On the one hand, warm medicine is for the purpose of strengthening the body: because taking warm medicine itself can stimulate and activate all the yang qi in the human body, and make the yang prosperous water drink; On the other hand, it

is to dispel evil spirits, drinking is yin evil, and getting warm will transform it[25]. In the clinical treatment of patients with acute pyelonephritic edema, the use of warm medicine based on the principle of "promoting, dissipating, opening, and guiding" is indeed a fundamental treatment method. In my personal opinion, the clinical pharmacological effect of "Xing" lies in dispersing cold and promoting qi. "Xiao" refers to the movement of qi, the elimination of phlegm, and the purification of drink, which has the meaning of attacking and expelling. "Opening" means opening the striae, which means sweating, 'Guiding' refers to guiding evil spirits out, that is adequate urination[26]. In addition to the above symptoms, there are also clinical experiences in treating Male infertility from phlegm [27], hair loss from phlegm [28], tongue numbness and cold from phlegm[29], and amenorrhea from phlegm [30]. "Phlegm often causes various diseases," and phlegm retention is once again reflected in clinical practice due to its multiple pathogenic changes.

In summary, "warming medicine and harmonizing it" is a fundamental method for treating phlegm and yin disorders. According to the "Su Wen Ling Lan Mi Dian", "Drinking enters the stomach, overflows the essence and qi, and is transmitted upwards to the spleen. the spleen qi disperses the essence, which is transmitted upwards to the lungs, regulates the water channels, and transmits downwards to the bladder. the water essence is distributed in four directions, and the five meridians are in parallel." the "Su Wen Ling Lan Mi Dian" says: "The three jiao are the ones that solve the malfasance of the official organs, and the water channels flow out." the "Health Preserving Recipe Tan Yin" also records: "The kidney can absorb water, the kidney water is mild, and then the water and liquid are transported downwards." These traditional Chinese medicine classics all tell us, the treatment of phlegm yin disease needs to be based on a clear understanding of its etiology and pathogenesis, and differentiation and treatment.

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Research Progress on The Influence of Traditional Chinese Medicine on Gastrointestinal Hormones in The Treatment of Functional Constipation

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Abstract: Functional constipation (FC) is a common functional gastrointestinal disease with various causes and complicated pathogenesis. Modern western medicine mainly uses laxatives, but drug dependence will occur after long-term use, and it is easy to relapse after withdrawal, and the long-term curative effect is not satisfactory. Traditional Chinese medicine is effective and widely used in the treatment of FC. the commonly used treatment methods include internal treatment, external treatment, combined treatment and so on. Recent studies have shown that constipation can cause changes in gastrointestinal hormones, and the level of gastrointestinal hormones can be adjusted to varying degrees through the treatment of traditional Chinese medicine to relieve constipation symptoms of patients. In recent years, the understanding of the influence of traditional Chinese medicine treatment of FC on related gastrointestinal hormones was summarized in order to play a greater role in the treatment of FC.

Keywords: Functional Constipation; Gastrointestinal Hormone; Traditional Chinese Medicine

Functional constipation (FC) is a common functional gastrointestinal disorder (FGID), defined according to the Rome IV criteria as difficulty in defecation and reduced stool frequency or incomplete defecation, and does not meet the diagnostic criteria of irritable bowel syndrome (IBS) [1]. FC belongs to the category of "constipation", "intestinal dryness", "difficulty in defecation", and so on in traditional Chinese medicine. It was first seen in the discussion of "difficulty in defecation" and "obstruction before and after" in Huangdi Neijing [2]. the basic pathogenesis is the dysfunction of the large intestine conduction function, which is related to the dysfunction of the five internal organs. Spleen governs transportation and transformation, which is the foundation of acquired constitution and the source of qi and blood biochemistry. Spleen deficiency leads to qi deficiency and blood deficiency, qi deficiency leads to weak conduction, and blood deficiency cannot moisten the intestine. Liver governs the dispersion and regulates

the qi movement. If liver fails to disperse, the intestines will not be able to disperse. If liver blood is deficient, the intestines will not be nourished. Both of them can cause constipation. Kidney main seal, orifices in the two lower orifices, kidney qi deficiency, kidney Yang deficiency, kidney Yin deficiency can cause constipation.

Epidemiological surveys show that with the aging of society, the pace of modern life and changes in eating habits, the incidence of constipation in China is on the rise. the prevalence of women is higher than that of men, and the prevalence of the elderly increases with age [3]. This has become one of the important factors affecting the quality of life of modern people, and it is a good factor for many diseases. Studies have shown that traditional Chinese medicine treatment of FC combined with the basic characteristics of traditional Chinese medicine syndrome differentiation and treatment and the overall concept, the use of different traditional Chinese medicine treatment, regulation of related gastrointestinal hormone levels, treatment of functional constipation, and achieved ideal clinical efficacy. the effects of traditional Chinese medicine on FC on related gastrointestinal hormone levels are reviewed as follows.

1. GASTROINTESTINAL HORMONES AND FC

Gastrointestinal motility is an extremely complex and highly coordinated neuromuscular activity, which is mainly stimulated by nerves and endocrine. the central nervous system (CNS), autonomic nervous system (ANS) and enteric nervous system (ENS) are all involved in the control of gastrointestinal motility. NS produces neurotransmitters and gastrointestinal hormones jointly regulate gastrointestinal motility. Gastrointestinal hormones are chemical substances released by gastrointestinal endocrine cells and nerve cells, which can effectively regulate the gastrointestinal physiological function of the body. They belong to peptides in chemical structure, so they are also called gastrointestinal peptides. According to the different effects of direct contraction and relaxation of gastrointestinal smooth muscle cells, gastrointestinal hormones can be divided into two

types: excitatory and inhibitory. Any kind of abnormality can affect colonic motor function and induce gastrointestinal functional diseases. Similarly, constipation can also lead to gastrointestinal dysfunction, mental anxiety, nutritional disorders and decreased immune function, affecting water and electrolyte balance and intestinal mucosal integrity, causing changes in gastrointestinal hormones and reducing the quality of life of patients.

So far, more than 60 kinds of gastrointestinal hormones have been found [4]. the gastrointestinal hormones that excite gastrointestinal motility mainly include motilin (MTL), gastrin (GAS), and substance P (SP). Among them, MTL is mainly secreted and synthesized by duodenal and jejunal mucosa. By reducing the level of extracellular Ca^{2+} , increasing the secretion of pepsin and increasing the concentration of acetylcholine, gastrointestinal motility is faster [5]. GAS is synthesized and secreted by the upper mucosa of the small intestine, which can stimulate the secretion of a large number of pepsin and gastric acid, stimulate intestinal peristalsis and gastric contraction, and its insufficient secretion may lead to gastric emptying disorder [6]. SP is also a brain-gut peptide, which has a specific neural pathway for gastrointestinal smooth muscle. In addition, Vasoactive intestinal peptide (VIP), cholecystokinin (CCK), glucagon-like peptide-1 (GLP-1), somatostatin (SS), neurotensin (NT) and corticotropin-releasing hormone (CRH) are all inhibitory gastrointestinal hormones, and the common point of their effects is to inhibit postprandial gastric emptying and extension. Among them, VIP is distributed in all layers of the gastrointestinal tract. the main physiological function is to relax the gastrointestinal smooth muscle, prevent gastrointestinal emptying and slow down gastrointestinal motility, and reduce the excitability of gastrointestinal nerves [8]. CCK is widely distributed in the pancreas, gallbladder and the whole intestine. It can not only stimulate the secretion of pancreas and bile, but also participate in the regulation of gastrointestinal motility and emptying through a variety of ways [9-10]. SS is mainly secreted by D cells in the pancreas, stomach, and intestinal mucosa, binds to the smooth muscle SS receptor, inhibits the release of acetylcholine, or participates as a neurotransmitter in the gastrointestinal descending inhibitory motor reflex, inhibits smooth muscle contraction, and inhibits the release of gastrin [11]. At present, the most studied gastrointestinal hormones are mainly: excitatory gastrointestinal hormones include MTL, GAS, SP; inhibitory gastrointestinal hormones have VIP and CCK [7].

2. WESTERN MEDICINE TREATMENT OF FC

On the basis of adjusting the diet structure, maintaining emotional comfort, developing regular defecation habits and adhering to physical exercise, modern western medicine treatment is mainly based on drug treatment. Including all kinds of laxatives,

gastrointestinal motility drugs; probiotics, secretagogue drugs, etc [13]. In addition, biofeedback therapy [14], gastrointestinal pacemaker [15], fecal microbiota transplantation [12] and so on have also been gradually applied in clinical practice. For refractory constipation, when the effect of conservative treatment is not good, surgical treatment can be considered according to the needs of the disease. There are various kinds of drugs in the treatment of FC in western medicine, mainly symptomatic treatment, which relieves symptoms quickly and has good short-term efficacy, but the long-term efficacy is not ideal, and it is easy to relapse after withdrawal, and the action link is single. For example, long-term use of irritant laxatives can lead to irreversible intestinal nerve damage and colon melanosis, and there is serious drug resistance, but it aggravates constipation after withdrawal. Microecological preparations can effectively improve constipation in patients, but the effects of different strains, different doses, different combined eating methods and time on the treatment of constipation still need further study [12]. Biofeedback therapy is a biological treatment method based on behavioral medicine. It can relax the spastic pelvic floor muscle tension and adjust the coordination of pelvic floor muscle defecation. However, the efficacy of different types of FC after biofeedback therapy is quite different, and the treatment time is long. Patients are prone to lose patience and confidence. It is necessary to communicate effectively with patients and give full play to patients' subjective initiative and compliance in order to achieve good results [14]. Surgical treatment is not easy for patients to accept, because of its high cost, large trauma, uncertain efficacy, and there is a certain incidence of complications and recurrence rate. It can be seen that although western medicine treatment can temporarily relieve constipation symptoms, it does not cure the symptoms, long-term application of adverse reactions, high drug resistance, and even disrupt the normal work of the intestine, thereby aggravating constipation, forming a vicious circle. Therefore, it is of great clinical significance to find a more effective treatment.

3. CHINESE MEDICINE TREATMENT OF FC

Traditional Chinese medicine focuses on regulating the balance of yin and yang, qi and blood of the viscera as a whole, seeking the root of the disease, and has unique advantages in treating chronic functional constipation. Relevant studies have shown that the expression of serum MTL, GAS and VIP in patients with functional constipation is abnormally low, and it is significantly related to the severity of the disease [16]. Similarly, TCM syndrome differentiation and treatment of functional constipation can regulate the level of gastrointestinal hormones to varying degrees and improve the symptoms of constipation.

3.1 Internal treatment of TCM

Traditional Chinese medicine has a long history in the treatment of FC. With the progress of the times, the

development of science and technology and the improvement of people's living standards, Chinese herbal medicine can not only be boiled into traditional Chinese medicine decoction, but also be condensed into traditional Chinese medicine granule preparation, Chinese patent medicine, traditional Chinese medicine ointment, etc. While ensuring the curative effect, the taste of oral administration of traditional Chinese medicine is constantly improved to meet the pursuit of "convenience" and "comfort" of patients. Relevant clinical observation studies have found that Wang Xiuzhen [17] used Bushen Tongjie Decoction to treat patients with functional constipation of spleen and kidney yang deficiency. After treatment, the serum VIP, NO and nNOS levels in the observation group were significantly lower than those in the control group. the results suggest that Bushen Tongjie Decoction in the treatment of functional constipation of spleen and kidney yang deficiency may promote the intestinal motility of the body by down-regulating the expression levels of intestinal neurotransmitters VIP, NO and nNOS in the body. Wu Fengchuan [8] found that the treatment of functional constipation with Buzhong Yiqi Decoction can regulate the levels of gastrointestinal hormones MTL and SP, relieve the symptoms of constipation and improve the ability of the body's metabolism. Pei Jingbo [18] used Xuanfei Tongbian Decoction to treat functional constipation. the study showed that the serum MTL, GAS and VIP in the treatment group were significantly higher than those in the control group, which may be related to the stimulation of gastrointestinal hormone secretion by different mechanisms of Xuanfei Tongbian Decoction. He Fenghua [19] research team used Jiawei Shenqi Dihuang Decoction to treat chronic functional constipation in the elderly with deficiency of both qi and yin. the results showed that Jiawei Shenqi Dihuang Decoction could significantly improve the serum SP and VIP levels of patients and alleviate the clinical symptoms of patients. Zhou [20] found that patients with chronic functional constipation of qi and yin deficiency can improve the therapeutic effect, relieve constipation symptoms, improve SP and MTL levels, reduce NO production, and improve colon transmission function. In addition, related animal experimental studies have found that Wang Yujin [21] established a functional constipation model in SD rats. the treatment group was given different doses of Xiaofu Tongjie Decoction by gavage. the general performance of the rats in each group was observed. the first black stool discharge time, Elisa method to detect SP, VIP, NO, 5-HT in rat serum. Research shows that Xiaofu Tongjie Decoction can improve the symptoms of constipation in rats with functional constipation, increase the level of SP in serum of rats with functional constipation, reduce the levels of NO and 5-HT, and increase the expression level of VIP mRNA in colon tissue. Through the research results, it

is speculated that the occurrence of constipation in rats may be related to the abnormal expression of intestinal neurotransmitters. the mechanism of Xiaofu Tongjie Decoction in the treatment of functional constipation may be achieved by changing the expression of related intestinal neurotransmitters SP, VIP, NO and 5-HT.

3.2 External treatment of TCM

In recent years, acupuncture, massage and acupoint application have been widely used in the treatment of FC. Acupuncture is a traditional treatment method of traditional Chinese medicine. It mainly stimulates the physiological regulation mechanism of the body by stimulating the acupoints, so as to achieve the purpose of treatment. Massage is to adjust yin and yang, dredge meridians and relieve symptoms through various techniques. Related studies have shown that abdominal massage can significantly increase intestinal peristalsis, enhance the regulation of defecation reflex by the lower central nervous system in the cerebral cortex and lumbosacral spinal cord, improve the tension of abdominal muscle, levator ani muscle and colonic smooth muscle, and accelerate intestinal excretion by gradually improving the movement disorder of intestinal smooth muscle [22]. Acupoint application is under the guidance of the theory of meridians and collaterals, on the basis of dialectical treatment, combined with the role of acupoints and drugs to create and develop a unique, acupoint combined with traditional Chinese medicine external treatment. TCM is prepared into a paste and applied directly to the acupoints, and the acupuncture points are pricked by the traditional Chinese medicine. Meng Xiaomeng [23] observed the effect of traditional Chinese medicine acupoint application on VIP and SP in colonic myenteric plexus of rats with functional constipation, and explored the mechanism of acupoint application of traditional Chinese medicine to improve functional constipation. In the experiment, it was observed that the positive expression of VIP and SP in the colonic myenteric plexus of rats increased after the application of traditional Chinese medicine on bilateral "Tianshu" acupoints, and their defecation function was improved.

3.3 Combined therapy

The combination of internal and external treatment of traditional Chinese medicine and the combination of traditional Chinese and Western medicine in the treatment of FC has the effect of strengthening the body resistance and eliminating the evil, increasing the efficiency and reducing the side effects. Lin [24] observed the effect of warm acupuncture combined with Tiaowei Chengqi Decoction on gastrointestinal hormones in patients with functional constipation. the control group was treated with Tiaowei Chengqi Decoction, and the observation group was treated with warm acupuncture combined with Tiaowei Chengqi Decoction. the results showed that warm acupuncture combined with Tiaowei Chengqi Decoction in the treatment of functional constipation could significantly

improve the curative effect compared with Tiaowei Chengqi Decoction alone, and its mechanism might be related to the regulation of gastrointestinal hormone levels. Zhang Yongxi [25] used abdominal acupuncture combined with Buzhong Yiqi Decoction to treat functional constipation of qi deficiency type. Buzhong Yiqi Decoction was used as the control group. the observation group was treated with abdominal acupuncture combined with Buzhong Yiqi Decoction. After treatment, it was found that the treatment effect of qi deficiency type FC combined with abdominal acupuncture and Buzhong Yiqi Decoction was ideal, which could promote the secretion of excitatory gastrointestinal hormones and achieve the purpose of treating diseases. It is speculated that the reason may be that abdominal acupuncture combined with traditional Chinese medicine in the treatment of qi deficiency type FC can effectively affect the neuro-endocrine network and brain-gut axis, change the secretion of gastrointestinal hormones, and alleviate clinical symptoms. Zhou Wei [26] observed that acupuncture [10] combined with auricular point sticking in the treatment of functional constipation. the results showed that the levels of serum SP, VIP and NO in the study group were better than those in the control group after treatment. It is speculated that acupuncture combined with auricular point sticking to control disease progression may be achieved by regulating the intestinal neurotransmitter pathway. Zhao Zirui [6] used massage combined with external application of Xiaoji powder at Shenque point to observe the defecation of children with functional constipation and its effect on gastrointestinal hormone levels. the control group was given routine treatment, and the observation group was given massage combined with external application of Xiaoji powder at Shenque point on the basis of routine treatment. After treatment, it was found that the levels of MLT, GAS and SP in the observation group and the control group were significantly higher than those before intervention, and the observation group was significantly higher than the control group, which indicated that massage combined with external application of Xiaoji powder at Shenque point could promote the secretion of gastrointestinal hormones, thus achieving the purpose of enhancing gastrointestinal motility. He Yuanyuan et al [27] used polyethylene glycol 4000 powder as the control group to observe the curative effect of Huaiqihuang granule combined with polyethylene glycol 4000 powder in the treatment of constipation in children and the effect of gastrointestinal hormones in children. the results showed that the serum SP, MTL and GAS levels in the observation group were significantly higher than those in the control group, and the SS level was significantly lower than that in the control group, indicating that Huaiqihuang granule combined with polyethylene glycol 4000 powder in the treatment of functional constipation in children can significantly alleviate the

symptoms of children, regulate gastrointestinal hormones, and have a significant clinical effect.

4 SUMMARY AND OUTLOOK

In summary, FC is a common clinical disease, with many causes and complex pathogenesis. In recent years, the incidence of FC is more and more serious. Syndrome differentiation and treatment is a key stage in the treatment of traditional Chinese medicine, and it is also the main feature of traditional Chinese medicine different from western medicine. According to the etiology and degree of constipation in patients, the corresponding treatment of FC was selected. These treatment methods have the advantages of economic safety, simple operation, and patients' willingness to accept. Clinically, a variety of methods can be used in combination to avoid adverse drug reactions and improve the therapeutic effect. At present, studies have shown that there is a clear correlation between the incidence of FC and gastrointestinal hormones. It is of great significance to regulate the level of related gastrointestinal hormones to improve the therapeutic effect of FC. TCM plays an important role in regulating gastrointestinal hormones, maintaining gastrointestinal barrier function, and promoting gastrointestinal motility. It provides a new choice for the treatment of FC, and also brings gospel to FC patients. Although the good efficacy of TCM in the treatment of FC has been widely recognized in clinical practice, the target of TCM in regulating gastrointestinal hormones is still unclear, and the mechanism of action in the treatment of FC still needs to be verified by a large number of objective data. If combined with modern research techniques, the relationship between TCM treatment of FC and gastrointestinal hormones is studied from multiple levels and aspects, it is more conducive to guiding clinical medication and providing new ideas for the treatment of FC.

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The Thinking and Method of Differentiation and Treatment of Gastroesophageal Reflux Disease Based on “excess of yang and deficiency of yin”

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Abstract: Gastroesophageal reflux disease is one of the refractory diseases of the digestive system, which has the characteristics of poor efficacy and easy to recur. “excess of yang and deficiency of yin” comes from the “Yellow Emperor's Internal Canon”, which highly summarizes the physiological function of the spleen and stomach and its pathological characteristics, Based on this theory, the pathogenesis of gastroesophageal reflux disease is summarized as virtual and real association, cold and heat are mixed, and the clinical effect is very good, which provides new ideas and methods for the treatment of GERD.

Keywords: Excess Of Yang And Deficiency Of Yin, Gastroesophageal Reflux Disease, Morbidity, Onset, Governance

Gastroesophageal Reflux Disease is a digestive system disease caused by reflux of gastric and duodenal contents into the esophagus and throat, resulting in esophageal manifestations such as acid reflux, heartburn, foreign body sensation in the throat, as well as extraesophageal manifestations such as poor appetite, fatigue, irregular bowel movements, and cough. According to the pathology observed under gastroscopy, it can be divided into three types: non erosive reflux disease (NERD), reflux esophagitis (RE), and Barrett's esophagus (BE)[1]. Recent data shows that the incidence rate of GERD is increasing year by year, and the prevalence of GERD typical symptoms in China is about 2.5%~7.8%[2]. As for the pathogenesis of gastroesophageal reflux disease, many scholars have different opinions. For example, Zhonghao Wang[3] believes that the junction area (GEJ) is the starting point of GERD, which is related to the low pressure of the lower esophageal sphincter (LES), and its dynamic characteristic is the low dynamic state of gastroesophageal; Linghong Chen[4] proposed that the occurrence of GERD is due to two reasons: esophageal motility disorders and impaired esophageal clearance of reflux substances; Xiong Yang[5] thought that the injury of esophageal sphincter function and esophageal mucosal function affect the pathogenesis of GERD.

There is no name for gastroesophageal reflux disease in traditional Chinese medicine. According to its pathological characteristics and clinical manifestations, GERD can be roughly classified as “acid vomiting” and “noisy” in traditional Chinese medicine[6]. It is believed that the onset of GERD is due to a loss of spleen and qi, a disharmony of stomach qi, and a conflict between the upper and lower parts of the esophagus. Due to the liver being the main source of relaxation and the circulation of the lung, hand, and Tai Yin meridians running through the stomach, the onset of this disease is based on the spleen and stomach, involving the liver and lungs. Kaijuan Liu believe that the occurrence of GERD is related to all five organs[7]. Clinical manifestations include acid reflux, heartburn, and discomfort in the throat. In terms of treatment, there are no specific drugs in western medicine at present, and most of them use antacids, gastrointestinal motility promoting drugs, gastric mucosa protection and other measures. Many patients are insensitive to single drug treatment, which can develop into refractory GERD[8], requiring combined medication or surgery. Traditional Chinese medicine treatment starts from the spleen and stomach, combined with the treatment of liver, lung, kidney and other organs, achieving considerable clinical efficacy.

1. ANALYSIS OF THE THEORETICAL MEANING OF “EXCESS OF YANG AND DEFICIENCY OF YIN”

The saying “Excess of yang and deficiency of yin” originated from the “Yellow Emperor's Internal Classic”; Qi Bo said: “Yang is excess, and the weather is also dominant outside; Deficiency of yin inside. Therefore, excess of yang and deficiency of yin”. This theory concisely discusses the basic connotation of Yin and Yang, that is, those who are upward and outward, full and overflowing mostly belong to Yang, while those who are downward and inward, weak and insufficient mostly belong to Yin. the theory proposed by Zhu Zhenheng that “there is excess of yang but insufficient of yin” is based on this, and uses the natural laws of the growth and decline of yin and yang in heaven and earth to analogy the changes in yin and

yang of human body qi. On the basis of this theory, Ma Shi also divided the qi of the meridians into six yang qi and six yin qi. As the saying goes, "Life's six yang qi is like the weather, mainly transported externally; life's six yin qi is like the earth's qi, mainly transported internally; those with yang transported externally are solid, while those with yin transported internally are void". In later generations, it is mainly developed from the aspects of visceral diseases, the nature of evil energy, and the pathology of the spleen and stomach. In summarizing spleen and stomach diseases, it is pointed out that the disease is caused by the middle energizer, with more yang deficiency and more tai yin deficiency. Taiyin disease is often manifested in weak spleen, insufficient circulation, slight loss of water and grain essence, insufficient spleen yang, inability to clear and warm up water and dampness, and other aspects; the main pathology of Yangming disease is the obstruction of excess pathogenic factors in the stomach and intestines caused by stomach deficiency. When treating spleen and stomach diseases, the spleen deficiency syndrome is replenished from the Tai Yin, while the stomach deficiency syndrome is pursued from the Yang Ming. If there are stomach disease deficiency syndrome and spleen disease excess syndrome, the treatment also starts from the spleen and supplements from the stomach and diarrhea. This article summarizes the physiological, pathological, and therapeutic characteristics of the spleen and stomach. In terms of physiology, the spleen and stomach belong to the earth in all five elements. Below the subdivision, the spleen belongs to the Tai Yin, which likes dryness but dislikes dampness. Its qi is suitable for ascending, while the stomach belongs to the Yang Ming, which likes to run but dislikes dryness. Its qi is mainly for descending. "The spleen often contains the essence of the stomach king, while the earth generates all things and follows the laws of heaven and earth", the water and valley included in the stomach are transmitted through the spleen to the whole body, where yin and yang are used interchangeably, and the ascending and descending are related to each other, and the exterior and interior are matched, jointly controlling the circulation and transformation. In terms of clinical pathology, the spleen belongs to the Taiyin region and is prone to damage due to endogenous yin pathogens. Diseases often start from dampness to coldness, and when suffering from yang deficiency, coldness is more common, hence the term "Deficiency of yin"; the stomach belongs to Yangming and is prone to external yang pathogenic factors. Diseases often turn from heat to dryness, and the excess of pathogenic factors should be considered as an injury. the excess of heat syndrome is common, hence the name " Excess of yang ". Therefore, there is a saying that "reality belongs to yangming, deficiency belongs to taiyin", which suggests that " Excess of yang and deficiency of yin" is related to the onset of spleen and stomach

diseases[9] , and is used to guide the diagnosis and treatment of spleen and stomach diseases[10] .

2. THE RELATIONSHIP BETWEEN "EXCESS OF YANG AND DEFICIENCY OF YIN" AND THE ONSET OF GERD

The first work to propose the pathogenesis of GERD is "Su Wen Zhi Zhen Yao Da Lun": "All kinds of vomiting acid, sudden injection and coercion, all belong to heat". In addition, the book "Zhang Shi Yi Tong·Tui Sour" also mentions that "if the dampness in the stomach accumulates due to stagnation, heat will be generated in the dampness, and it will turn from wood to acid vomiting". It is pointed out that the occurrence of GERD is related to dampness, heat, and other solid pathogenic factors. the evil energy accumulates in the stomach organs, and the stomach qi reverses the onset of GERD. Xiaolan Yin[11] pointed out that typical symptoms such as acid reflux and heartburn can occur when the stomach loses circulation and descends, carrying damp heat and turbid qi up to the chest. There is also the saying in "Shou Shi Bao Yuan·Swallowing Acid" that "those who are sour have a taste of liver wood, which is made of gold by fire. If the wood cannot be flattened, then the liver wood will become extremely sour, so it is also sour", indicating that the onset of acid vomiting is closely related to the liver and gallbladder. the liver qi is not sparse, which offends the stomach qi horizontally, and the upper part offends the esophagus; the evil of dampness and heat accumulates in the gallbladder, fumigating the stomach organs, and causing the loss of stomach qi to reduce the incidence of diseases. the book "Complete Records of the Integrated Medical Department of Ancient and Modern Books: Er Men" states: "Yang Ming received the valley qi, intending to reach the surface from the lungs, and the lung qi returned to the stomach, and the qi went against each other, returning to the stomach. Therefore, it is called pussy". It is pointed out that the inversion of lung and stomach qi can occur as pussy. the external cold, heat, and dampness enter the lungs and stomach through the mouth and nose, and combine with the food qi in the stomach, producing toxins and phlegm, and competing with the lung qi. the lung qi is stagnant and obstructed in the throat; Emotional imbalance harms the liver, causing stagnation of liver qi, which runs against the stomach, causing abnormal circulation of qi and blood in the stomach. Blood stops and becomes stasis, and qi, toxin, stasis, and phlegm are cemented in the stomach and esophagus. the qi in the organs is blocked and cannot be lowered when it is lowered. the qi in the liver and stomach that goes against the qi in the lungs also goes against the qi, resulting in the disease, manifested as acid reflux, belching, and obstruction in the pharynx. Whether invaded by external pathogens, or due to improper eating and drinking, or affected by emotions, solid pathogens such as qi, fire, dampness, and toxin are

obstructed in the stomach organs, disrupting the qi mechanism. Additionally, due to the excessive qi and blood in the stomach meridians of Foot Yangming, the blood vessels are also affected over time, ultimately manifested as acid reflux, bloating, upwelling, and stabbing pain. Internal and external solid pathogens damage the yang meridians and organs, and the sign of excessive evil is called "Excess of yang"

The Yellow Emperor's Internal Classic states that "when evil energy is abundant, it becomes solid, and when essence and energy are seized, it becomes void". It is believed that all diseases are caused by insufficient positive energy, and are also caused by the invasion of evil energy into the body. Li Dongyuan mentioned in his book "Spleen and Stomach Theory" that "all diseases are caused by spleen and stomach failure, and treating the spleen and stomach can pacify the five organs", indicating that no matter what disease occurs, it cannot be separated from the factor of spleen and stomach weakness, and diseases of all organs ultimately lead to spleen and stomach internal deficiency. In the onset of GERD, if it is initially insufficient, it will nourish the acquired weakness, and if its vitality is insufficient, it will lose its ability to maintain the soil; Secondly, the accumulation of external evil, diet, and emotions over time leads to the conflict between good and evil, damaging the source of qi and blood; Thirdly, the integration of yang and qi can lead to deficiency of both yang and yin due to qi deficiency, resulting in insufficient middle yang. In the end, all three can experience dull pain, vomiting of clear water, and fear of cold. The evil of cold and heat deficiency can damage the yin meridians of the yin organs over time, leading to the appearance of yin deficiency. This is called "Deficiency of yin".

The discussion on the etiology and pathogenesis of GERD has been mentioned in traditional Chinese medicine classics throughout history, the "Su Wen Zhi Zhen Yao Da Lun" states: "The victory of Shaoyang lies in the heat of the stomach.. vomiting acid and good hunger". It is believed that the evil energy of Shaoyang's liver and gallbladder is strong, and it invades the stomach and intestines to cause diseases; the Complete Book of Jingyue: Swallowing Acid "states": If the skin is exposed to wind cold, there are many people who swallow acid. "It suggests that external wind cold can also cause acid swallowing"; According to the book "Medical Heart Transmission Record: Pharyngeal Acidity Should Stop Eating", "Both those who swallow acid and those who vomit acid are due to spleen deficiency and cannot transform their diet", it is pointed out that the spleen and stomach are weak, the intake and circulation of food are abnormal, and the accumulation of food qi leads to acid vomiting; the book "Treatise on the Origin of Various Diseases and Etiology: Treatise on Vinegar" states: "Those who engage in vinegar experience cessation of phlegm from the upper energizer, and stagnation of cold in the spleen and stomach..." It is believed that

phlegm and drink stop internally, and there is cold in the middle energizer, and the diet cannot be fully transported and transformed, leading to upward inversion; In the "Summary of Baby Protection-Swallowing Acid": In the "Su Wen, it refers to the heat, so it refers to the end; in the Dongyuan, it refers to the cold, so it refers to the original.. If the heat is caused by thirst, it is easy to eat food, and the food is easy to digest, it is for the internal heat of the solid fire, and the stomach meridian heat is also.. If not thirsty, it is difficult to digest hot food, it is caused by the deficiency fire, and the stomach meridian cold is also" the statement points out that the pathogenesis of this disease is different from cold and heat, and there are differences between deficiency and reality. However, in summary, it belongs to the relationship between deficiency and reality, and the combination of cold and heat. Those who experience heat due to heat, phlegm, and stasis are affected by the stomach and yang meridians; Those who suffer from deficiency due to cold in deficiency fire are affected by the spleen and yin meridians, which conforms to the theory of "Excess of yang and deficiency of yin". Scholars such as Menghuan Xia[12] pointed out that the function of the spleen and stomach includes the entire digestive system, where the stomach is responsible for ripening, the spleen is responsible for transportation, and the essence of water and grain is distributed throughout the body. If the spleen and stomach fail to function properly, or if there is an imbalance in movement and upregulation, the disease will occur. If the long-term fine blood supply is insufficient, and the visceral nourishment is insufficient, GERD can further develop into refractory GERD, and even cause systemic symptoms beyond the digestive system.

3. "EXCESS OF YANG AND DEFICIENCY OF YIN" AND GERD TREATMENT

The diagnosis and treatment of this disease are highly praised by doctors and professors. After studying Liu Wansu's "Fire Heat Theory", Fang Shi et al. [13] discussed and treated it from five aspects: clearing heat and toxin, transforming dampness and heat, soothing liver qi, promoting lung qi, and nourishing yin liquid. Ling Yu[14] Differentiation and Treatment of GERD from the Imbalance of Qi Movement and Unbalanced Profit and Loss. In response to the pathological characteristics of the association between deficiency and excess, as well as the combination of cold and heat, in clinical syndrome differentiation and medication, it is necessary to first identify the specimens of deficiency and excess, and then identify the extreme cold and heat. the treatment can start from tonifying deficiency, reducing excess, and warming the stomach.

3.1 tonifying deficiency and reducing excess of "excess of yang and deficiency of yin"

Diseases of the Yangming stomach and viscera are often caused by external pathogenic factors, and the disease is characterized by excess evil energy, mostly resulting in excess. Therefore, "reality leads to

Yangming". Diseases of the Taiyin spleen are caused by internal pathogenic factors, and the disease is caused by insufficient positive energy, mostly resulting in deficiency syndrome. Therefore, "deficiency leads to Taiyin". Based on the comprehensive physiology and pathology of spleen and stomach deficiency and excess, the treatment should be based on the actual differentiation of symptoms, tonifying deficiency and reducing excess. Firstly, the stomach and intestines are often invaded by external cold and heat, diet, and other solid pathogens. Therefore, during treatment, it is necessary to adhere to the principle of purging excess qi, mainly by clearing the stomach, lowering the stomach, and opening the stomach. However, the stomach is plagued by excess pathogenic factors and has been damaged by the depletion of qi and yin over time. At this time, it is not advisable to simply clear diarrhea. Instead, it is necessary to replenish qi and yin, mainly by nourishing and supplementing, supplemented by clearing away excess pathogenic factors. Secondly, the yang qi of the spleen is prone to injury due to endogenous non pathogenic factors. If yin pathogens such as phlegm dampness and blood stasis persist for a long time and become chronic diseases, treatment should supplement the middle and strengthen the qi of the middle jiao by removing the pathogenic factors and strengthening the qi of the middle jiao. Thirdly, due to deficiency of spleen and stomach elements, deficiency of qi and blood biochemistry, weakness in warmth and agitation, and obstruction of water and blood due to obstruction. During treatment, it is necessary to supplement the spleen and stomach qi, and appropriate drugs for promoting qi, promoting blood circulation, and dampness should be added to ensure that the qi is replenished and the evil qi is expelled.

3.2 "excess of yang and deficiency of yin": dredge stomach and warming spleen

The organs of the Yangming stomach are fond of moistening and detest dryness, based on body fluids; Therefore, the disease of Yangming is susceptible to pathogenic factors and heats up, consuming fluids and fluids; the spleen of Taiyin likes dryness but dislikes dampness, using yang qi as its function. Therefore, the disease of Taiyin is prone to pathogenic factors and cold transformation, consuming qi and damaging yang. Liu Wansu believes that "if the stomach diaphragm is very hot, it is vomiting, and the phenomenon of fire and gas rising is also present", and "if the gas rushes back up, the phenomenon of fire and gas rising is also present". the mechanism and responsibility of GERD disease lies in the stomach, which belongs to the accumulation of qi and fire in the stomach. It can also be caused by stagnation of liver qi, prolonged stagnation of fire heat and qi, transformation of phlegm heat and blood stasis, mutual interference of qi, fire, phlegm and blood stasis, and disturbance of the water and valley in the stomach. To treat the excess

pathogenic factors in the stomach, one is to clear and lower the Qi mechanism. the Qi mechanism of ascending and descending can be reduced, the water and grains in the stomach can be stabilized, and acid reflux can be healed. Professor Bin Yu has achieved significant clinical efficacy in treating GERD with Chaihu Shugan Powder[15] ; the second is to relieve stomach heat, the evil of fire and heat can be released, and the qi and food heat can be relieved. Orange peel and bamboo mushroom soup can be added or reduced to clear the stomach and stop vomiting without damaging the stomach yin. the third is to clear the stomach (lung) and dissipate phlegm, while the stomach qi is unobstructed. the lung qi naturally decreases, and the pathogenic factors of phlegm heat can be released. Xuanfu Daizhe Tang can be used to clear and lower the lung and stomach[16] ; the fourth is to relieve stomach and promote blood circulation. If stomach heat is relieved and blood stasis is relieved, the pain will be relieved. On the basis of clearing stomach heat, appropriate medication such as Danshen, Danpi, and Sanqi can be added to dissipate blood stasis and unblock collaterals. the pathogenesis of GERD is specific to the spleen, which belongs to the spleen with excessive internal cold. Cold qi, cold dampness, cold stasis, and other injuries affect the middle earth. There are also cases of cold in the stomach, where the middle yang is not active. It is recommended to treat the disease by warming the middle and expelling pathogenic factors. Xiangsha Liuju Tang can be used to warm the stomach, and the cold pathogenic factors in the spleen and stomach can be transformed. If the yang qi in the middle jiao is restored, the disease will occur.

In summary, GERD should distinguish between deficiency and excess cold and heat, and after clarifying the mechanism of the syndrome, it should follow the principle of supplementing deficiency and reducing diarrhea, and treating cold as warm and heat as clearing.

3.3 Strengthening the spleen and stomach throughout the entire treatment process

Overall, the pathogenesis of GERD is a mixture of deficiency and excess, with both cold and heat coexisting. Whether it is stomach deficiency or stomach deficiency, it is based on spleen deficiency. Strengthening the spleen and stomach should run through the entire diagnosis and treatment process. the stomach is a yang organ, and the occurrence of diseases is mostly due to solid evil. If the evil energy is stagnant for a long time and turns into heat, then it will rot and swallow acid, causing noise and discomfort in the stomach; the spleen is a yin organ, and diseases often arise due to deficiency. Due to spleen deficiency, the transportation of water and grain essence is weak, and it stops in the middle energizer. If it accumulates for a long time and transforms into pathological products such as qi, dampness, and blood stasis, it will become

acidic or cause vomiting of clear water. the strength and weakness of the virtual and real mentioned here are relative terms. Only when all human functions reach a relatively stable state can Yin and Yang be calm, and mental health be maintained. If the stomach qi is relatively strong, or the temper is relatively weak, with an imbalance of yin and yang, the stomach is not in harmony with the spleen, and it is easy to experience discomfort such as swallowing and vomiting sour water, nausea and vomiting[17]. In terms of treatment, strengthening the spleen and harmonizing the stomach are combined, balancing deficiency, excess, cold, and heat, and treating yin and yang together. the spleen qi and stomach qi are balanced, resulting in orderly ascending and descending, smooth qi movement, and self healing of the disease.

In the process of inheriting Professor Shen Shuwen's research on spleen and stomach diseases, Professor Hui continuously explores and innovates, and has a deep understanding of the theory of "yang excess, yin deficiency". It is often integrated and applied in the diagnosis and treatment of clinical gastroesophageal reflux disease. According to Professor Shen's dialectical thinking, the pathogenesis of GERD should belong to the relationship between deficiency and reality, with a combination of stagnation and loss, and a mixture of cold and heat. Therefore, in treatment, it is important to emphasize the importance of purging excess without forgetting to protect the vital energy. When using the bitter and cold herbs of *Coptis chinensis* and *Scutellaria baicalensis*, it is appropriate to supplement them with herbs such as yam, ginseng, and *Ophiopogon japonicus* that can strengthen the spleen and stomach; Supplementing deficiency should prevent nourishment and obstruction of the stomach; When using herbs such as *Angelica sinensis*, *Ajiao*, and *Yitang* to strengthen the spleen and stomach, carefully consider the dosage; *Poria cocos* is a combination of *Shenqu*, malt, and other blood activating drugs such as *Sanleng* and *Zedoary turmeric*, which can regulate qi and eliminate accumulation without forgetting benefits and losses; When repairing damage, stagnation occurs in the body, and herbs such as *Codonopsis pilosula* and *Astragalus membranaceus* are also supplemented with herbs such as tangerine peel and bergamot to replenish qi; Clearing heat and supplementing with sweet and warm herbs, using gypsum for clearing the stomach and *anemarrhena*, supplemented with licorice, *atractylodes macrocephala*, etc; Supplemented with cool and moist ingredients, used together with dried ginger, *Wu Zhuyu*, and *Tian Dong Yu Zhu*. In this way of treatment, there are divisions in the combination, and there are divisions in the combination, balancing the deficiency, excess, cold, and heat of the spleen and stomach.

4. CONCLUSION

The theory of "excess of yang and deficiency of yin" briefly summarizes the physiological and pathological characteristics of excess of yang and stomach, easy

stagnation and heat transformation, and excess of spleen and deficiency from cold transformation in Taiyin. After being expanded from different perspectives by various medical experts in later generations, it has a broader and deeper meaning, which has guiding significance for the treatment of spleen and stomach diseases. Based on this theory, this article analyzes the pathogenesis and treatment of gastroesophageal reflux disease, a difficult to treat disease, and highlights the significance of "excess of yang and deficiency of yin" in the treatment of gastroesophageal reflux disease. For empirical studies mainly focused on the stomach, the principle of "Tongjiangxieshi" should be followed; the deficiency syndrome mainly characterized by the spleen should focus on strengthening the spleen and tonifying the deficiency.

In addition, there are still the following problems in the differentiation and treatment of gastroesophageal reflux disease: firstly, there is still a lack of unified standards for traditional Chinese medicine classification of gastroesophageal reflux disease, so it is difficult to achieve good results in treatment. Secondly, in modern society, there are still many people who are affected by gastroesophageal reflux disease and find it difficult to ensure their quality of life and healthy psychological state. Further exploration should be made on how to alleviate the pain of patients while maintaining their psychological and social health.

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Summary of TCM Treatment Experience of Rheumatoid Arthritis

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Abstract: Rheumatoid arthritis is a systemic autoimmune disease, and the lesions often involve the systemic joints and their surrounding tissues, with a high prevalence and disability rate. A large number of clinical experience shows that TCM treats RA in various forms, with significant efficacy and little toxic and side effects. the experience of RA TCM treatment is summarized for clinical use.

Key words: rheumatoid arthritis arthralgia disease treatment experience in traditional Chinese medicine

Rheumatoid arthritis (Rheumatoid Arthritis, RA) is a systemic autoimmune disease, lesions involve the systemic joints and their surrounding tissues, the number of women more than men, with a high prevalence and disability rate. Modern medical treatment of RA is mainly: non-steroidal anti-inflammatory drugs, glucocorticoids, disease-modifying drugs and biological agents. Modern medicine is effective in controlling the condition and improving the quality of life, but it has side effects [1] Large, it is difficult for patients to take it for a long time. A large number of clinical experience shows that TCM treats RA in various forms, with significant efficacy and little toxic and side effects. the treatment experience is summarized as follows:

1. KNOWLEDGE OF RHEUMATOID ARTHRITIS IN TRADITIONAL MEDICINE

Rheumatoid arthritis belongs to the name of western medicine, and traditional Chinese medicine belongs to the category of "bi disease". According to its clinical manifestations and characteristics, also known as the calendar section disease, crane knee wind. "Su Wen · Bi theory" cloud: " the so-called bi, each to the wind and cold. "According to the classification of evil disease:" wind cold and wet three qi mixed to, combined for bi, its ethos is full for bi, cold for pain, moisture for bi also. "" Su wen · On the adverse direction of four times "recorded that" Jue Yin has more disease Yin bi, and insufficient disease produces heat bi. "" Synopsis of the Golden Chamber "set up another" calendar section disease ", that" calendar section pain, can not be extended ", " its pain is like lightning ". "Medical Introduction · Bi Feng": " Bi is the wind cold and wet three qi invasion, but the external evil is not qi and blood deficiency and not into. "Four Holy Heart source" recorded: " Ying wei, the qi and blood of the meridians also. Camp pulse, to honor four, Wei pulse, warm meat, fat Cou reason. Camp wei

discord, cou reason is not solid, external evil take advantage of the empty, stagnation in the joint and into bi. "Wu Jutong in the Qing Dynasty" warm disease strip discrimination "believes that bi syndrome" mostly at both ends of the cold and hot, virtual and real different treatment. "

2. UNDERSTANDING OF ETIOLOGY AND PATHOGENESIS

Mr. Hu Xishu believes that the bi syndrome [21] At the beginning of the table, mostly for the solar disease, the human body healthy qi deficiency, can also be less Yin disease. Bi syndrome has the characteristics of "heavy limbs and sour", is wet evil, wet evil is too Yin.

Hu Bin thinks [2] the etiology of RA mainly include: rheumatism, cold and heat, combined with bi; RA as a chronic disease, the disease is easy to qi stagnation and blood stasis, and then phlegm stasis, closed meridians; the spleen and stomach is the source of qi and blood biochemistry, all diseases cannot do without qi and blood, qi and blood obstruction, long injury, resulting in rise and loss.

Jin Mingxiu [3] It is believed that the deficiency of liver and kidney is the root cause of RA, the evil of wind, cold and humidity is the standard of disease, phlegm turbidity and blood stasis are the key factors, and the common return of RA is the consumption of qi and blood.

Liu Bailing, a master of traditional Chinese medicine [4] Inherit "from the blood theory treatment", emphasize the injury disease " stasis, new, bone. "And combined with the Huangdi Neijing to establish the clinical thinking of" treating the kidney is treating the bone ".

Zhang Minghe [5] It is believed that RA has more "heat bi", wind, cold, dampness and evil long accumulate heat, heat, poison and wet stasis condensation, and block the meridians.

Professor Ying Lin [6] With "evil, deficiency, poison, blood stasis" as the key to RA pathogenesis, advocate cold and heat and adjustment, deficiency and reality.

Zhang Tiancheng from the perspective of six meridian syndrome differentiation, put forward the theory of the treatment of rheumatoid arthritis [7].

Li Candong [8] It is believed that the incidence of RA is based on liver and kidney deficiency, wind, cold, wet, heat, qi, phlegm and blood stasis as the meridians.

3. TREATMENT

3.1 Prescription medicine

Mr. Hu Xishu [9] the treatment of bi syndrome to "small sweat, good urination" as the method. Rheumatism with evil to "small sweat" as a clever method. According to the syndrome differentiation of six classics and eight classes, the initial sense of wind evil is the table evidence, and the onset is solar disease. In the deficiency of the cold syndrome is a lunar Yin disease. Bi has many wind, cold and dampness, which is the disease of the sun cream. With "small sweating" as the method, ephedra and surgery soup, ephedrine and almond coix licorice soup, and astragalus soup are used to dispel wind and dehumidification. Feeling damp evil should be beneficial to urine, if cold and wet should be added on the basis of warm Yang scattered old medicine, prescription certificate with aconite soup, Gan Jiang Ling soup. On the basis of distinguishing the six classics, the root causes of clinical efficacy is "relieving urine" to remove dampness, and "small sweating" to remove wind and dampness.

Xiong Jibai [10] Old man treat bi syndrome first cold and damp and heat, according to the parts, medicine, neck often choose root, qiang, turmeric, upper limb qiang, wind, spirit fairy, lower limb damp and heat bi Lord to flavor two wonderful scattered alone live, knee, mulberry parasitic, heel kidney deficiency wet with four jin pills two wonderful powder add Bi, chuan knee, mulberry, parasitic, waist meridian qi ventilation scattered Lord, damp and heat stagnation four wonderful scattered main, liver and kidney deficiency alone live parasitic soup, clear bi syndrome deficiency, stubborn bi heavy dredge, using insects and rattan drugs.

Professor Liu Duzhou [11] He has a unique understanding of the application of typhoid fever and has rich experience in clinical diagnosis and treatment of rheumatic immune diseases. His self-proposed nine method of bi treatment has been used in clinical practice for a long time. Damp and heat pain syndrome using heat clearing, dampness and flavor of the cypress powder, dampness and heat deficiency syndrome and tonifying qi and blood, angelica pain and pain soup Lord. Cold and dampness obstruction using warm meridian scattered cold, dehumidification and dredging of Wutou Guizhi soup. Rheumbi syndrome adopts qiang living wet soup to dispel wind and dehumidification, dredging collaterals and relieving pain. Heat poison obstruction with five taste disinfection drink, fairy side live to drink heat and detoxification, cool blood activation. Bi syndrome is mainly pain to search and pick meridians, dispel phlegm and promote blood circulation as the method, commonly used whole scorpion, turtle insects, ground dragon and so on. Liver loss and drainage, limb pain with wood Hu Guizhi soup with liver and gallbladder, qi and blood camp. Cold and heat mixed bi is cold and heat, the same, Liu Lao use "three yellow soup" effect is quite good. the deficiency of qi and blood syndrome

is filled by eight soup and perfect soup. Liver and kidney deficiency, deficiency and deficiency mixed bi syndrome with independent parasitic soup, attack and complement.

Professor Jin Mingxiu [12] In the treatment of RA liver and kidney deficiency, Liuwei Dihuang pill is mostly added and reduced. To cure the symptoms of the use of wind, qiang live, live alone, etc., cold wins in the kidney of the basis of the sun, joint acid and dampness of the disease, Poria, pig cocos with cassia branch warm Yang qi and urine clearing damp dampness. Hot sheng with more honeysuckle, dandelion and so on. Pay attention to reduce phlegm, remove blood stasis and pass collaterals, commonly used peach red four things soup to add and subtract. Healthy spleen and stomach zhengzhengqi with raw astragalus. Pay attention to the syndrome differentiation of meridian drugs.

Chen Jifan, professor with Wuling powder dispel wind cold wet [13], Treatment of RA disease activity acute phase, joint swelling obvious wet winner. Add wind, dry ginger dispel wind cold, seven leaf lotus wet. Angelica nourishing blood dispel wind reflects Li Zhongzi "wind first blood, blood self-destruction".

Li Candong [14] Professor the acute period of wind, cold and wet resistance syndrome is astragalus cassia root soup, damp and heat obstruction syndrome is four wonderful powder and flavor, and cold and heat mixed syndrome is small Chaihu soup and flavor. In the remission period, blood stasis and poison were mixed with four vines, phlegm stagnation and qi stagnation with Chai peony warm bile soup, and liver and kidney deficiency.

3.2 Acupuncture

The treatment of Fang Jianqiao emphasizes syndrome differentiation [15], Bi desirable wind gate, wind pool, large vertebra with blood sea, three Yin intersection, bi moxibustion fenglong, pain bi should use electric acupuncture and local a acupoint moxibustion, heat bi take large vertebra, qu pool, bi syndrome long into phlegm stasis, deficiency syndrome take fenglong, diaphragm Yu, Baihui, Guan Yuan and other methods with cupping or moxibustion. the prescription emphasizes the use of acupuncture in the treatment of RA, including acupuncture and stabbing. "Ling Shu · official needle" contains: " Qi thorn, straight into one, side into two, to treat the cold small deep. Or said three thorns, three thorns, treat bi gas small deep also. "Can treat cold evil ji range small and deep bi syndrome acupuncture method. "Near the needle, straight stab, near the stab each, to treat the stay for a long time. "This method is used in obvious pain points, fixed, fixed over time. Is the first straight needle, and then in the near oblique needle, is with, bi syndrome slow. And to supplement the method, can regulate the qi and blood meridians.

Clinical efficacy of warm acupuncture in RA [16], 56 RA patients were randomly divided into the treatment

group and the reference group, and the total response rate was 96.43% in the treatment group and 71.43% in the reference group. the curative effect of warm acupuncture is obviously better than that of ordinary acupuncture.

Professor Tang Yuxiu treated bi syndrome [17] First of all, pay attention to the disease, to local acupoint. After determining the location of bi syndrome, local acupoints with meridian acupoints. According to the pathological obstruction, with certain acupoints, the wind pool, wind, diaphragm yu, blood sea, acupuncture in pain and cupping, so that the evil hidden. In addition to local acupoints, cold evil and elderly deficiency often moxibustion men, Guanyuan, wet evil sheng with Sanli, Yanglingquan and other points, and heat bi increases the vertebral and qu pool.

3.3 Needand drug combination

The curative effect of cassia branch peony decoction combined with tonifying kidney and removing stasis acupuncture [18], 100 RA patients were randomly divided into the control group and the observation group, and the treatment response rate of the observation group reached 98.00%, which was significantly better than that of the control group.

Acupuncture and xuanbi soup for the treatment of cold and dampness bi-type rheumatoid arthritis [19], 86 patients were randomly divided into 43 patients in the observation group and the control group, and the total response rate of the observation group was better than that of the control group.

coix seed decoction combined with acupuncture on pain in RA patients with wind-cold obstruction [20], 100 patients were randomly divided into control group and observation group, and concluded that coix decoction combined with acupuncture and moxibustion had a significant clinical effect, which could reduce the incidence of adverse reactions.

4. CONCLUSION

The course of rheumatoid arthritis is difficult to heal. A lot of clinical experience shows that the treatment of RA has little side effects and remarkable effects, which has strong clinical potential, and the effect of treatment with correct acupuncture and moxibustion syndrome differentiation is better. the summary of RA TCM treatment experience is beneficial to the clinical service.

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Research on The Supply Chain Project Management of Civil Aircraft Development

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Abstract: Due to the long industrial chain and wide geographical distribution, the supplier project control of the civil aircraft development process has been faced with a large number of problems and challenges. Under this premise, according to the characteristics of civil aircraft development stage and characteristics, combined with the project management requirements, make full use of the existing advanced information means, this paper introduces the concept of supplier project control based on hierarchical supplier control system, to ensure that the civil aircraft development stage of project management is effective.

Keyword: Civil Machine Development; Supply Chain Management; Project Management System

1. INTRODUCTION

The development of civil aircraft is a large-scale and technically difficult project, which requires the close cooperation of multiple disciplines and fields such as machinery, electronics, aviation, materials, and the suppliers or supply chains involved will be very diverse, including avionics, machinery manufacturing, material production, testing and certification and other aspects. For example, the C919 and ARJ 21 are two large civil aircraft independently developed by China, whose development involves a number of enterprises and fields. the development of the C919 involves hundreds of Chinese enterprises, covering engines, structural parts, power transmission, power system, ventilation and air conditioning, man-machine interface and other fields. the ARJ 21 involves 135 industrial manufacturers, including not only aviation manufacturers, but also many more component suppliers. the flight safety of civil aircraft is the primary consideration, which needs to go through strict testing and certification, and needs to meet various international standards and norms. Therefore, due to the high safety and reliability requirements of the development and production of civil aircraft, it is very careful when selecting and managing suppliers, requiring strict evaluation and cooperative negotiation, and ensuring the quality and delivery control of each supplier to ensure that the finished products meet the safety and quality standards.

Supplier management in the manufacturing process needs to build an efficient supply chain system, and ensure supplier quality and delivery control by

maintaining supplier cooperation, evaluating and selecting suppliers, managing quality suppliers, supplier delivery, quality and cost, reducing supplier delivery time and reducing cost. In the civil aircraft manufacturing process, the supplier management must also comply with the standards and regulations involved, such as ARP4761 and ARP4754A, etc. Supplier cooperation also requires strict contractual and legal guarantees to ensure the quality and reliability of civil machine manufacturing. For civil aircraft development enterprises or organizations, fine and efficient supplier management is also one of the important factors to improve competitiveness and enhance market advantages. Therefore, the supplier management in the development of civil aircraft needs overall planning, scientific planning, flexible deployment, comprehensive coordination and quality control to ensure that the whole project has an efficient and reliable supply chain system.

In recent years, the global civil aviation market has developed relatively fast, and the market competition for the development of civil aircraft is becoming more and more fierce. This requires enterprises to maintain or improve their competitiveness through innovation, cost reduction and quality improvement, and to put forward higher standards and requirements for the selection and management of suppliers. for instance The development of civil aircraft involves many suppliers and supply chains, which need to be strictly evaluated and managed to ensure the quality and safety of the products

Suppliers of civil aircraft development face high requirements and risks in terms of quality and delivery time. If the quality of the supplier is not up to standard and the delivery period is delayed, it will affect the overall process of the civil aircraft production and the quality level of the aircraft.

The development of civil aircraft needs a long period and a large amount of financial and technical support, which further increases the difficulty of supplier management, and puts forward higher requirements for the organization, management and technical capabilities of enterprises

The management of suppliers involves many factors such as exchange rate, transportation and logistics, market demand, and may change with the change of time and policies, requiring enterprises to adjust and

adapt to the situation at any time.

Due to the many problems and challenges faced by supplier management, enterprises need to have good project management experience and tools, and strengthen market monitoring, coordination, prediction and information exchange to optimize their supply chain performance and provide better manufacturing services.

The arrival of the digital information age, the trend of information development to supplier control problem hope: supply chain data information can realize comprehensive monitoring and tracking of supply chain, enables the enterprise to timely understand the situation of suppliers, inventory and delivery status, and tracking and management, in order to improve the transparency and accuracy of the supply chain. At the same time, in terms of finding and screening potential suppliers, enterprises can also manage the basic information, procurement history, materials and supplier performance records of existing suppliers. In the era of digital informatization, how to achieve fine control of multi-level suppliers in aviation has become a research hotspot in the industry and academic circles

2. RESEARCH STATUS BOTH AT HOME AND ABROAD

Supply chain management is the participation in the supply chain between organizations, departments of logistics, information flow and capital flow planning, coordination and control, etc., its purpose is to improve the speed of all related process and certainty, maximize the net added value of all related process, improve the operation efficiency and efficiency of the organization [1].

Supply chain management is also proposed by European and American enterprises in the face of the increasing competitiveness of Japanese and other East Asian enterprises in the international market. One of the main reasons for the success of East Asian companies, especially Japanese companies, is the coordination and integration of all links in the supply chain. For example, within the enterprise, TQM

comprehensive quality management and JIT on-time management are adopted, emphasizing the cooperation of various departments to reduce costs and improve quality. Outside the enterprise, adopt outsourcing system and reduce the number of component suppliers, and establish partnerships with them to jointly improve quality and reduce costs. In addition, the enterprise management system adopts flexible manufacturing system to improve the enterprise adaptability and service level. In order to cope with this international competition, European and American enterprises have introduced the concept of supply chain management in time, and a typical example is Chrysler Corporation (Chrysler Corporation). Chrysler is designing production lines for new models such as the Dodge Intrepid and Eagle Vision. Outsource at least 70% of components to a few suppliers and invites suppliers to participate in early critical research and development phases. RESULTS the new product development cycle, from component development to successful final assembly, is usually reduced from 5-6 years to 39 months of [2].

In the second half of the 1980s, papers on the relationship between Japanese companies and suppliers appeared extensively. Typical of these are: Clark discusses the process [3] of joint product development between Japanese companies and their suppliers. John Mc Mllan This paper discusses the contractual relationship between Japanese enterprises and suppliers under special circumstances, and further compares the advantages and disadvantages of the existing systems of Japanese and American enterprises [4-5]. One of the reasons for the strength of Japan's manufacturing sector is its unique component outsourcing system, the [6]. Similarly, in 1993 Jeffrey H. Dyer and Willian G. Ouchi summarized similar conclusions on the special relationship between enterprises and suppliers in related articles [7].

3. A HIERARCHICAL AND DECENTRALIZED SUPPLY CHAIN PROJECT CONTROL MECHANISM

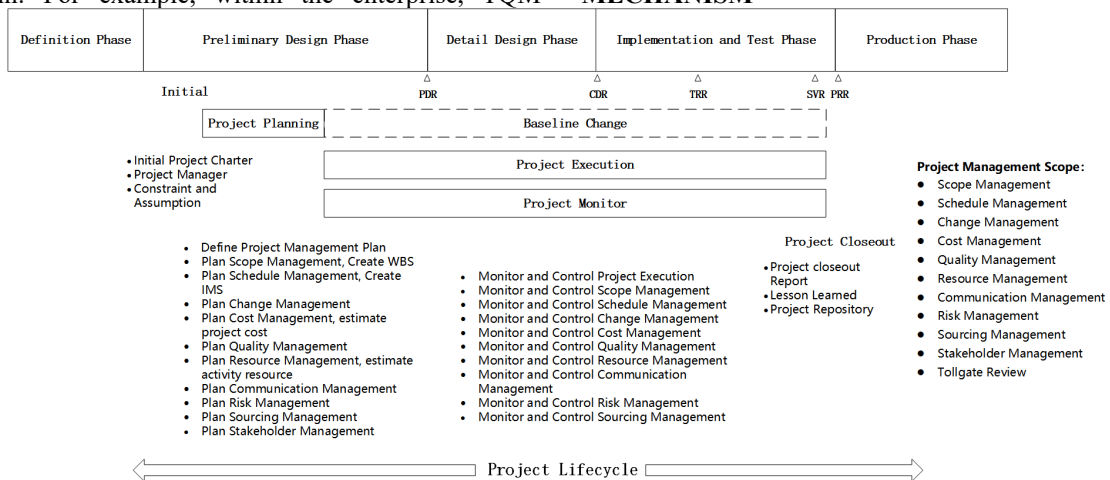


Figure 1 A Schematic diagram of the project lifecycle phase

According to the HB8525 civil aircraft development program, the development of civil aircraft products and

services is divided into five stages: demand and concept demonstration, preliminary design, detailed design, trial production and verification, and mass production (See Figure 1)[8].

Table 1 Comparison of extensive project management and refined project management

Extensive supplier project management	Fine grading decentralized supplier project management
Stage by profession, focusing only on tasks	Focus on deliverables
can not guarantee the integrity of the plan	100% coverage to ensure mission integrity
no estimate of work load effort, can not accurately estimate project costs	Estimate project cost based on estimated hours
deliverables delay will not be found until they are due	Real-time monitoring project supervision during R & D, timely deviation analysis, corrective action
Huge change costs impact	

For example, in the conceptual design stage, the designer will conduct in-depth research and analysis of the aircraft's requirements, performance requirements, market trends, etc., and determine the basic design scheme of the aircraft. In the detailed design stage: in the detailed design stage, the designers will conduct in-depth calculation, analysis and simulation of the scheme determined in the conceptual design stage, but also need a variety of complex, precise and detailed work to develop the detailed design scheme of the aircraft. Therefore, according to the characteristics of civil aircraft research and development, the traditional

extensive supplier project management cannot meet the complex and diverse requirements, and the refined hierarchical and decentralized project management has become the best choice.

At the same time, it is noted that hierarchical decentralized project management is a very effective project management method, which distributes the power and responsibility of projects to teams and leaders at different levels, in order to better manage projects and increase communication and collaboration among team members. In this project management model, the project is divided into multiple stages, each with different teams and leaders responsible. More specifically, this approach breaks down items into different levels, each with corresponding managers and independent decision-making powers. This approach ensures effective management and control of the project by subdividing the project tasks and assigning permissions. This hierarchical and decentralized project management mechanism is very suitable for the project control of multi-level suppliers, which can not only ensure the one-account control of the project, but also realize the fine management of the project.

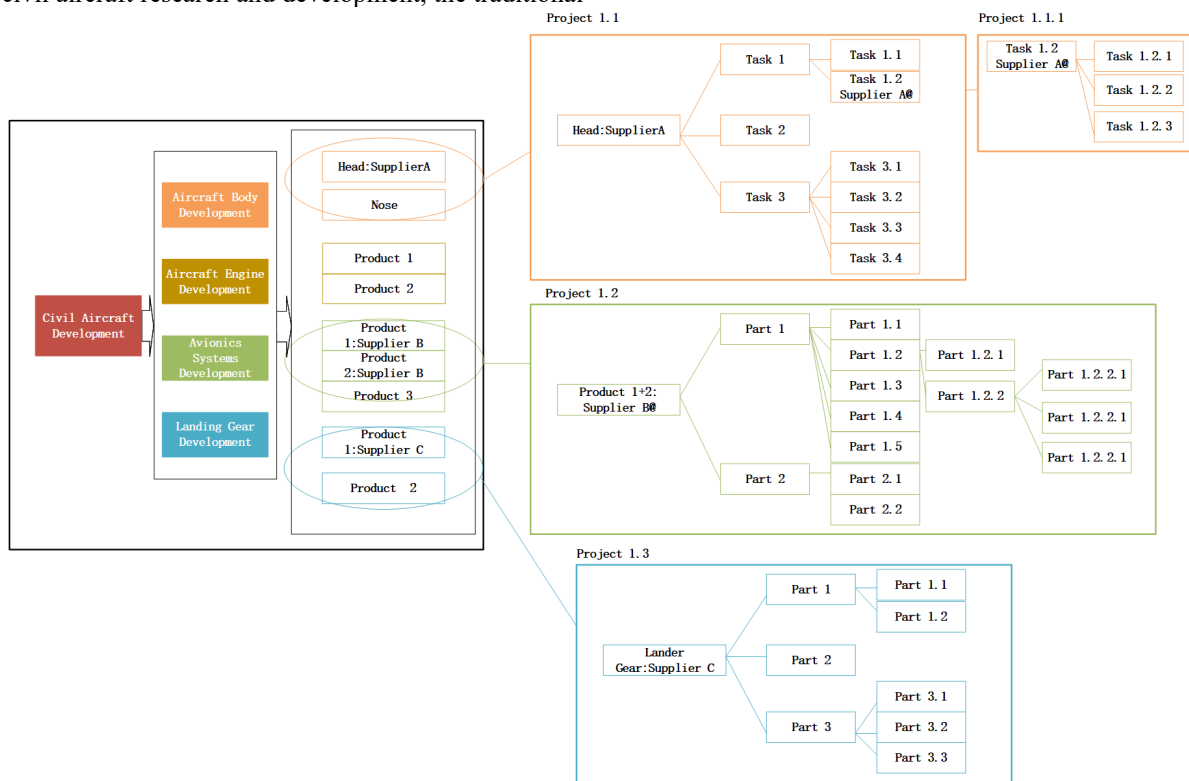


Figure 2 Multi-level supplier project control mechanism

The main principles of supplier project control mechanism are: 1) assign relevant tasks to the relevant supplier person in charge in a major project; 2) for a certain supplier, support selecting the tasks assigned in Project 1 and establish the team of Project 1.1 and Project 1.1; 3) Similarly, tasks in Project can also be assigned to relevant suppliers and support further decomposition; 4) Establish correlation between tasks

assigned to new projects and realize the consistency of status data.

Based on this multilevel supplier project control mechanism, we can:

3.1 Improve the efficiency of supplier cooperation

The success of the project also depends on the good cooperation with the suppliers. During the project development period, the supplier's capability has an

important impact on the project. Through supplier project management, the relationship with suppliers can be strengthened, and the cooperation efficiency of the project can be improved, and the possible misunderstandings and conflicts can be reduced.

3.2 Increase supply chain transparency

Supplier project management can help Party A (project management party) to establish a transparent information and communication mechanism between suppliers and suppliers, so that Party A can directly understand the project delivery time forecast and risk. This can reduce possible project stagnation and benefit all project members.

3.3 Improve project schedule management

through effective management and coordination of suppliers, the project schedule can be more timely, effective and reasonable, and more predictable, so as to comprehensively improve the progress, quality and feasibility of the progress of the project.

4. CONCLUSION

To sum up, with the gradual development of domestic civil aircraft and informatization, due to the characteristics of supply chain distribution, industrial chain long, the current civil aircraft development process of supplier control faces a lot of problems and challenges, and based on a single data source of multilevel supplier project management information system may be the most effective solution. Therefore, we carry out the study of supply chain project management system, put forward hierarchical decentralization of supply chain project control mechanism, given can guarantee the host

manufacturers of the project account control, and can realize the supplier project progress of fine management solutions, makes the civil aircraft development stage of project management more effective, so as to achieve the purpose of quality control, control progress, control cost

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Progress in Diagnosis and Treatment of Peptic Ulcer with Helicobacter Pylori Positive

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Abstract: the pathogenesis of peptic ulcer is complex, among which helicobacter pylori infection is an important pathogenic factor. In this paper, the pathogenesis, diagnosis and treatment of helicobacter pylori positive peptic ulcer were reviewed. the rise of antibiotic resistance of helicobacter pylori leads to the failure of radical treatment of Hp, which affects the recovery of peptic ulcer, and the problem that western medicine alone cannot effectively relieve the clinical symptoms of patients with peptic ulcer. A number of clinical observations and experiments have proved that integrated treatment of traditional Chinese and Western medicine can solve this problem.

Keywords: Helicobacter Pylori, Peptic Ulcer, Combination Of Traditional Chinese And Western Medicine

Peptic ulcer (PU) includes gastric and duodenal ulcers. It is caused by a reaction of stomach acid and pepsin to the stomach mucosa. This can lead to localized tissue defects, inflammation and necrosis, which can reach the muscular layer [1]. Helicobacter pylori (H. pylori) is associated with a variety of internal and external gastrointestinal diseases. Studies have shown that about 90% of duodenal ulcers and about 80% of gastric ulcers are related to H. pylori infection [2]. Therefore, in 1994, the first global consensus on the management of H. pylori infection recommended peptic ulcer as an indication of H. pylori eradication [3]. Eradication of H. pylori can promote ulcer healing and significantly reduce the rate of ulcer recurrence and complications [4]. This article reviews the pathogenesis of H. pylori in peptic ulcers and the progress in diagnosis and treatment of H. pylori positive peptic ulcers in recent years.

1. PATHOGENESIS OF H. PYLORI IN PEPTIC ULCER

Helicobacter pylori is an oxygen-philic gram-negative bacterium that colonizes the mucosal surface of human stomach. HP changes the physiological environment in the stomach, affects the secretion of pepsin and gastric acid, mediates immune inflammation, induces apoptosis, and destroys the immune defense mechanism of the host [5]. the helical structure of HP and its outer membrane protein adhere to gastric epithelial cells, and transfer toxic substances into gastric epithelial cells through the pathogenic island of *cagA*, inducing paracrine, causing cell vacuole, gastric

homeostasis disorder and local inflammation, and ultimately leading to the occurrence and progression of ulcers [6].

2. DIAGNOSIS OF H. PYLORI POSITIVE PEPTIC ULCER [7-9]

2.1 Clinical manifestations

2.1.1 Symptoms

The typical clinical manifestations of PU are chronic, periodic and rhythmic epigastric pain. Gastric ulcer and duodenal ulcer pain location and onset time are different. the pain site of gastric ulcer was left upper abdomen, duodenal ulcer was right upper abdomen. PU usually presents dull pain, burning pain or distending pain. Gastric ulcers are mostly painful after eating, and are relieved before the next meal. Duodenal ulcer is mostly empty abdominal pain, pain in the middle of the night, eating can alleviate. And often accompanied by acid reflux, belching, nausea, vomiting and other symptoms.

2.1.2 Physical Signs

The lack of specific signs of PU was mainly manifested as localized tenderness in the upper abdomen. the tenderness of gastric ulcer is in the middle or left of the upper abdomen, and the tenderness of duodenal ulcer is in the right of the upper abdomen.

2.1.3 Complications

The main complications of PU include upper digestive tract bleeding, perforation, pyloric obstruction and cancerization. Some PU patients have complications as the first diagnosis symptom.

2.2 Relevant Checks

2.2.1 Electronic gastroscopy

Electronic gastroscopy is the preferred method for diagnosing PU. Under gastroscopy, PU is usually round, oval or linear, with smooth edges or covered with moss film, and the surrounding mucosa can be seen with hyperemia and edema. According to the development process of ulcers and gastroscopy findings, ulcers can be divided into active stage (stage A), healing stage (stage H) and scar stage (stage S), and each stage is further divided into two stages, namely, A1 stage, A2 stage, H1 stage, H2 stage, S1 stage and S2 stage [10].

Stage A1: the center of the ulcer is covered with thick white fur, may be accompanied by bleeding or blood scab, congestion edema is obvious, the ulcer is round or oval;

Stage A2: Ulcer covered with yellow or white fur, no

bleeding, surrounding congestion, edema began to subside.

H1 stage: the ulcer becomes shallow, the ulcer surface shrinks, the ulcer coating becomes thin and fades, the surrounding congestion and edema disappear, accompanied by new capillaries;

H2 stage: the ulcer continues to become shallow and smaller, and the surrounding mucosal fold is concentrated towards the ulcer.

S1 stage: the ulcer white fur disappeared, the central hyperemia showed red new mucosa;

Stage S2: the newly formed mucosa of the ulcer changes from red to white.

2.2.2 X-ray barium meal examination

X-ray barium meal examination can provide an important basis for diagnosis for patients who have contraindications or do not want to accept gastroscopy. the main X-ray image of PU is the niche or niche, which is revealed by filling the ulcer with barium. the positive niche is rounded or oval, with neat edges and a circular clear area surrounding the ulcer due to mucosal edema.

2.2.3 H. Pylori detection

At present, H. pylori (Hp) tests include invasive and non-invasive tests.

Invasive tests rely on gastroscopy to biopsy gastric mucosa tissue and related tests, including: (1) rapid urine test (RUT): it has the advantages of high accuracy, simplicity and speed, with sensitivity and specificity of more than 90% [11], and is one of the common methods for clinical diagnosis of Hp. (2) Gastric mucosa biopsy staining microscopy: the advantage is that the pathological diagnosis of gastric mucosa can be carried out at the same time, with high sensitivity and specificity. (3) Bacterial culture: Hp culture is the most direct evidence for judging infection, with a specificity of 100%[12]. However, due to the limitations of equipment, cost and technology, this method is not recommended in clinical practice. (4) Endoscopy: the development and improvement of endoscopic technology has made it possible to diagnose Hp under endoscopy. Some scholars believe that gastric mucosal swelling, punctata erythema, plica swelling and other endoscopic manifestations can help diagnose Hp infection. However, as a detection method, the results of endoscopy are related to the experience and ability of endoscopists, and there are great differences in specificity and accuracy, so endoscopy is not recommended as a single diagnostic basis [13].

Non-invasive tests include: (1) 13C or 14C urea breath test (UBT): the sensitivity and specificity of 14C-UBT were more than 90%. UBT has the advantages of simple operation, low technical requirements, and good compliance of test personnel, so it is widely used in clinical work. UBT is the most accurate, popular and universal method for diagnosing Hp infection [14]. (2) Fecal antigen test (HpSAT): SAT is easy to operate, suitable for any age, and is the most beneficial test for

subjects with poor compliance. Studies have shown that its specificity is 93% and sensitivity is 91%, which shows no statistically significant difference from the detection results of UBT, and can be used as an alternative [15]. (3) Serum anti-H. Pylori antibody detection: This detection method is simple to operate, inexpensive, and not affected by drugs. Some studies have pointed out that the specificity and sensitivity of rapid colloidal gold detection of Hp are 88.9% and 94.1%[16], but because positive patients cannot be identified as active or previously infected, UBT is often combined for diagnosis.

It should be noted that in addition to serum anti-H. pylori antibody testing, proton pump inhibitors (PPI) must be stopped for at least 2 weeks, and antibiotics, bismuth and certain Chinese medicines with antibacterial effects must be stopped for at least 4 weeks before Hp testing. These drugs inhibit the growth of Hp and reduce its activity. In addition, PPIs and H2 blockers also inhibit gastric acid secretion and significantly increase the pH level in the stomach, thus affecting Hp urease activity. Since both UBT and RUT are based on the detection of urease activity, taking these drugs before Hp detection can significantly affect the detection of Hp in UBT and RUT, resulting in false negatives [17].

3. TREATMENT OF H. PYLORI POSITIVE PEPTIC ULCER

3.1 Treatment principles

The purpose of PU treatment is to relieve symptoms, promote ulcer healing, prevent complications and prevent ulcer recurrence, focusing on reducing the damage of various injury factors on mucosa and enhancing the protection of defense factors on mucosa. Hp should be eradicated regardless of whether the ulcer is active or not and whether there is a history of complications [13]. Therefore, Hp eradication therapy is the basic therapy for HP-positive PU.

3.2 Hp eradication therapy

China's fifth H. pylori Consensus [13] recommended seven bismuth quadruples (PPI+ bismuth +2 antibiotics) as the main empiric treatment to eradicate Hp. the resistance rate of Hp to fluoroquinolones such as clarithromycin, metronidazole and levofloxacin showed an increasing trend [18]. Studies have shown that adding bismuth agent on the basis of the original triple therapy can increase the eradication rate of HP-resistant strains by 30% to 40%[19]. Therefore, unless bismuth conjunctions are present or are known to be in areas with low resistance rates, bismuth quadruple regimens should be used as far as possible for empirical treatment to eradicate Hp.

The choice of bismuth quadruple regimen is actually the choice of two antibiotic regimens. the selection of antibiotic combinations in eradication programmes should be based on the monitored Hp resistance rate in the local population and the individual history of antibiotic use [20]. A retrospective analysis showed

that Hp resistance in East China was relatively significant, focusing on antimicrobial resistance such as clarithromycin, metronidazole, and amoxicillin [21]. Therefore, the characteristics of this region should also be taken as the basis for selection in the empirical treatment of Hp eradication in this region. For people who have used clarithromycin, metronidazole, and quinolones in the past, whether they were used to treat Hp or other diseases, their Hp infection is potentially resistant. In addition, factors such as efficacy, cost, potential adverse effects, and drug availability should be weighed to achieve individualized treatment.

In addition to the above-mentioned bismuth quadruple regimen, the modified quadruple therapy with Repapide has also recently been confirmed to improve the efficacy and eradication rate of Hp in patients with HP-positive gastric ulcer, and is significantly better than the traditional quadruple regimen in regulating serum gastrointestinal hormone and PG levels, with high safety [22], which is also worthy of clinical promotion and application.

3.3 Eliminate risk factors

Relevant studies have pointed out that the most common clinical risk factors for PU are drinking, smoking, Hp infection, taking NSAIDs, irregular diet, etc [23]. Eliminate risk factors, quit smoking, stop drinking NSAIDs, regular diet, can avoid its indirect or direct impact on gastric acid secretion and lead to gastric mucosal damage, resulting in further development or recurrence of ulcers.

3.4 Psychological Treatment

Previous studies on the etiology of PU have mostly focused on the physical aspect. With the deepening of research, it is believed that psychological factors and sleep quality are related to PU, which can lead to the occurrence of ulcers and hinder their healing [24]. Studies have shown that the incidence of anxiety and depression in PU patients is significantly higher than that in healthy groups [25]. For patients with PU accompanied by anxiety and depression, psychological intervention should also be taken into account while treating ulcers. Experiments have shown that combined treatment of PU with sleep intervention on the basis of routine quadruple radical treatment of Hp can effectively improve PU and improve the quality of life of patients [26]. To improve the psychological state of PU patients through sleep intervention and psychological counseling should be promoted in clinical practice.

3.5 Integrated treatment of Chinese and Western medicine

Many symptoms of PU patients are abdominal pain, nausea, vomiting, abdominal distension, belching and other gastrointestinal symptoms. PU has no corresponding disease name in Chinese medicine, according to its clinical symptoms can correspond to "stomach fullness", "stomach pain", "noisy", etc., on the basis of syndrome differentiation and treatment, combined with Western medicine treatment, can

effectively relieve symptoms. Through clinical observation, Li Shuhong et al [27] found that the curative effect of Xiangsha Liujunzi Decoction combined with quadruple therapy in the treatment of Hp infection-related PU with spleen and stomach weakness was comparable to that of simple quadruple therapy. Compared with simple Western medicine combined with quadruple therapy, the combined treatment of Chinese and Western medicine could improve the eradication rate of Hp and improve clinical symptoms. On the basis of conventional triple therapy for HP-related peptic ulcer, the addition of Banxia Xiexin Decoction can significantly improve the clinical symptoms of patients [28]. In addition, there are studies on the treatment of PU with Chinese medicine compound preparation combined with Western medicine, which also shows that the combined treatment has better curative effect [29].

Wang Zhendong et al [30] set up the Chinese medicine group, the Western medicine group and the Chinese and Western medicine group, and conducted a comprehensive efficacy score on its efficacy, Hp clearance rate and TCM symptom score through clinical observation. the results showed that the comprehensive curative effect of Chinese and Western medicine was better than that of simple use of Chinese or Western medicine. However, the clinical observation also showed that in the eradication of Hp, the simple treatment of traditional Chinese medicine was significantly lower than the simple use of Western medicine and the combination of traditional Chinese and Western medicine. the sole use of Chinese medicine in the treatment of H. pylori positive peptic ulcer is not aimed at eliminating Hp, but "comprehensive regulation" and "attenuating toxicity and enhancing effect" are mainly aimed at improving clinical symptoms, and the advantages of reducing drug resistance are also played [31].

Li Fenghua et al. [32] treated helicobacter pylori infection with Banxia Xiexin Decoction combined with Western medicine triple therapy, and the results showed that after 1 month of treatment, the positive rate of Hp in the combined Chinese and Western medicine group was lower than that in the Western medicine group alone ($P>0.05$). At the same time, after treatment, the main symptom score of the treatment group was lower than that of the control group ($P<0.05$). Studies on the in vitro antibacterial activity of single Chinese herbs such as Scutellaria baicalensis, honeysuckle and Fructus chinensis have also proved that multi-Chinese herbs have obvious antibacterial effect on Hp [33]. On the basis of regular anti-HP treatment combined with Chinese medicine in the treatment of helicobacter pylori positive peptic ulcer is worthy of clinical application.

At present, although the mechanism of TCM anti-HP is not very clear, relevant studies are emerging, especially those from the perspective of cytodynamics and molecular biology, and the problems of drug

resistance, single use or compatibility in the long-term application of TCM have been reported. Chinese medicine can not only eradicate Hp, but also enhance immunity, so as to achieve the purpose of prevention and control.

4. SUMMARY

As an infectious disease, the incidence of *H. pylori* is increasing in China. Studies have shown that the occurrence of PU is closely related to *H. pylori* infection. The diagnosis and treatment of helicobacter pylori positive peptic ulcer is based on the eradication of Hp. To improve the eradication rate of Hp, we should consider the characteristics of regional drug resistance and the actual situation of individuals, and determine the medication plan. In addition, TCM treatment has been effective in improving the eradication rate of Hp, alleviating the clinical symptoms of PU patients, and reducing the recurrence rate of PU. Although the Chinese medicine treatment of HP-positive peptic ulcer experience is still in the stage of small sample exploration, there is no unified standard for the syndrome type of HP-positive peptic ulcer in Chinese medicine, the lack of standardization, there is no consensus of the basic formula. In terms of research, there are few studies on different levels of tissues, cells, molecules, and genes, and there are still few clinical studies with unified efficacy standards and multi-center, randomized, double-blind clinical studies. However, the research on the mechanism of anti-HP of Chinese medicine is very popular in recent years, and the accumulation of experience in the treatment of HP-positive PU also proves the correctness of this research direction. With the further development of future research, it is bound to promote the treatment of integrated Chinese and Western medicine, so as to give full play to the advantages of traditional Chinese medicine.

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Fluent Numerical Simulation Study of Double Casing

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Abstract: This article uses FLUENT numerical simulation to simulate and study the key components of high output, long-distance conveying systems and double casing systems.

Keywords: FLUENT, Double casing systems, Multiphase turbulent flow.

1. INTRODUCTION

This project conducted numerical simulation research using commercial FLUENT software [1]. FLUENT software is currently one of the most popular CFD software in the market, with a market share of 60% in the United States. FLUENT's clients cover fields such as aerospace, rotating machinery, navigation, petrochemical, automotive, energy, computer/electronics, materials, metallurgy, biology, pharmaceuticals, etc. NASA, DOD, United States Department of Energy, ABB, Westinghouse, Boeing, Ford, Mitsubishi, IBM and DuPont are all representative users of FLUENT software [2-6]. In online surveys conducted in China, it was found that FLUENT is also the most widely used CFD software. FLUENT software can achieve the best Rate of convergence and solution accuracy because it adopts a variety of solution methods, grid division method combining Unstructured grid and adaptive grid, and multi grid accelerated convergence technology. At the same time, flexible unstructured grids, solution based adaptive grid technology, and mature physical models make FLUENT widely applicable in laminar and turbulent flow, heat transfer and phase change, chemical reactions and combustion, multiphase flow, rotating machinery, noise, material processing, fuel cells, and other fields.

Due to the extreme complexity of fluid motion, physical model experiments have limitations due to the complexity and measurement difficulties of the flow in complex boundary shapes that exist in practical engineering. Experiments often only provide parameters of the total flow, while numerical simulations can provide specific information about the relevant flow field. Because numerical simulation has many advantages, it has gradually become a powerful means to study Fluid mechanics..

2. GRID PARTITIONING

FLUENT software adopts the method of combining Unstructured grid and adaptive grid to divide the

grid. the meshes that FLUENT can generate include two-dimensional triangular and quadrilateral meshes, three-dimensional tetrahedral meshes, Hexahedron meshes, pyramid meshes, wedge meshes, and hybrid meshes composed of the above mesh types. the Unstructured grid generation program it provides is very effective for generating relatively complex geometric structured meshes. [7-8] Compared with structured grid and block structured grid, Unstructured grid generation is convenient for grid generation of complex shapes, while adaptive grid generation is convenient for computing the flow with sharp changes in flow field parameters and large gradients. At the same time, this generation method is also convenient for grid refinement and coarsening, making grid generation more flexible and simple.

This project utilized GAMBIT specialized grid division software to divide the area of the double casing structure. In order to make a significant comparison, we also performed the same grid division on the pipelines used for single pipe transportation, in order to achieve good comparison results in subsequent FLUENT software processing. As Shown in Figure 1.



Figure 1-1 Schematic diagram of calculation grid for double casing ash conveying pipeline

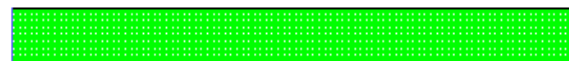


Figure 1-2 Schematic diagram of calculation grid for single pipe ash conveying pipeline

3. DESCRIPTION OF PHYSICAL MODELS

The calculation in this chapter is based on the material transportation model inside the pipeline. During the entire transportation process, the material laid flat at the bottom of the pipeline becomes loose under the pressure difference of the inlet and outlet airflow, and is ultimately blown away. the flow of materials in the pipeline is very complex, involving the initial stage, transition stage, and fully developed stage. [9-10] This article mainly studies the conveying performance under different double casing structures, in order to optimize the design of conveying pipelines. Therefore, it can be assumed that there is no heat exchange inside the pipe, that is, the pipe wall temperature is taken as a

fixed value (the first type of thermal boundary condition), which is the working environment temperature. Based on this, typical representative units can be selected for research in the calculation. For low-speed air flow, the following simplification can be introduced without a temperature difference:

- (1) Constant pressure gradient;
- (2) Neglecting the influence of gravity on airflow;
- (3) Air is incompressible fluid.

The physical parameters of air and materials are constants.

In the fully developed area, the flow parameters reach stability. If the accumulation of materials in the large pipe is still significant at this time, the double sleeve structure cannot be omitted. On the contrary, if the stacking is relatively light and the carrying airflow mainly flows through the main pipeline, the double sleeve structure can be simplified, or even a single pipe structure can be directly used. At present, there is no quantitative method to accurately define the fully developed section of double casing pneumatic transportation, and there is no method to measure the movement of materials in this section in detail. This project attempts to study the material operation status of this process through the use of FLUENT numerical simulation.

4. SELECTION OF MATHEMATICAL MODELS

The flow state of ash gas inside the double casing belongs to multiphase turbulent flow, which leads to the exchange of momentum, energy, and concentration between fluid media, and causes fluctuations in physical quantities. [11] Due to the small scale and high frequency of such fluctuations, direct simulation in actual engineering calculations requires high computer requirements. In this article, a double casing is selected for numerical simulation to complete a conveying cycle under a certain pressure gradient. And simulate single pipe transportation under the same working conditions, in order to summarize the advantages of double casing in large units and long-distance transportation, and obtain specific influencing factors.

4.1 BOUNDARY CONDITIONS

As shown in Figure 1-1, the double casing structure is periodic. For large units and long-distance transportation, high output can be achieved by increasing the material concentration in the pipeline. Long distance transportation can be achieved by setting the boundary condition as a cyclic boundary condition. the outlet boundary section parameter of the calculation domain is also used as the inlet interface parameter of the calculation domain. Furthermore, due to the unique periodic structure inside the double casing, although only one section of the double casing is calculated, But it reflects the entire long-distance pneumatic transport situation.

The maximum residual of quality continuity is calculated each time, so whether the calculation

converges mainly depends on the size of the residual of quality continuity. the continuity accuracy in FLUENT is set to 0.001, and the calculation of each time step is convergent at this accuracy. For the final convergence of the calculation, it can be judged based on whether the material delivery rate reaches stability or exhibits periodic changes, or whether the cross-sectional material volume fraction exhibits periodic changes.

4.2 EULERIAN MODEL

(1) Continuous equation

$$\frac{1}{\rho_{rq}} \left(\frac{\partial}{\partial t} (\alpha_q \rho_q) + \nabla \cdot (\alpha_q \rho_q \vec{v}_q) \right) = \sum_{p=1}^n (m_{pq} - m_{qp}) \quad (1)$$

Where α_q is the volume mass fraction,

$$\sum_{q=1}^n \alpha_q = 1, \quad \rho_{rq} \text{ is the volume density of } q^{th}.$$

(2) Momentum equation

The momentum equation in the Eulerian model includes the multiphase fluid fluid momentum equation and the fluid solid momentum equation. Here, the fly ash transported in the double casing can be approximated as a fluid composed of countless fine particles, with physical characteristics similar to water. Therefore, the momentum equation is chosen as follows:

$$\frac{\partial}{\partial t} (\alpha_q \rho_q \vec{v}_q) + \nabla \cdot (\alpha_q \rho_q \vec{v}_q \vec{v}_q) = -\alpha_q \nabla p + \nabla \cdot \vec{\tau}_q + \alpha_q \rho_q \vec{g} + \sum_{p=1}^N (K_{pq} (\vec{v}_p - \vec{v}_q) + m_{pq} \vec{v}_{pq} - m_{qp} \vec{v}_{qp}) + (\vec{F}_q + \vec{F}_{lift,q} + \vec{F}_{vm,q}) \quad (2)$$

Where \vec{g} is Gravitational acceleration, \vec{v}_{pq} is the interface speed.

Lift equation:

$$\vec{F}_{lift} = -0.5 \rho_q \alpha_p (\vec{v}_q - \vec{v}_p) \times (\nabla \times \vec{v}_q) \quad (3)$$

The lift equation is very important in calculating the transportation of materials in pipelines. As mentioned in previous experiments, when the airflow velocity in the pipeline is greater than or equal to the suspension velocity of the material, the animal material will flow towards the outlet.

(3) Energy equation

$$K_{pq} = \frac{\alpha_q \alpha_p \rho_p f}{\tau_p} \quad (4)$$

f means Drag function of fine particles, τ_p is the relaxation time of particles.

5. CONCLUSION

The gas-solid two-phase flow in a double casing pneumatic ash removal pipeline has the characteristics of low gas velocity, high concentration, and strong disturbance between gas and solid. Therefore, its flow state is different from general dilute phase transportation and belongs to

dense phase gas-solid two-phase flow. Especially with the addition and action of the inner tube, the gas phase flow inside has obvious turbulent flow characteristics. Therefore, the most important factor affecting high output and long-distance transportation is undoubtedly the structural mechanism of the double sleeve, and the addition and selection method of the inner tube are the technical core. Through numerical simulation of the transportation process, we have optimized factors such as the selection of the inner tube, the opening of the orifice plate, and the installation size of the orifice plate. For other key equipment that affects high output and long-distance transportation, this article has also conducted extensive simulation and optimization calculations, providing reference for engineering design and selection.

The inner pipe of the double casing ash conveying system is equipped with an opening system at regular intervals, and the distance between these openings will have a significant impact on the transportation of materials inside the pipe. In order to determine the design basis for the spacing of inner pipe openings in the design of double casing engineering, this paper successively established a numerical model for the spacing of inner pipe openings and conducted corresponding calculations. By simulating different spacing of openings, the optimal ratio was optimized. Based on experiments, we conducted simulation calculations on the spacing between openings of 300mm, 500mm, and 700mm. Large units and long-distance transportation mean that the amount of ash transported by the conveying pipeline per unit time is much larger than that of conventional conveying pipelines, and the diameter of the outer pipe of the ash conveying pipeline is determined based on the output borne by each pipeline. In this context of high output, how to determine the diameter of the inner pipe to achieve the best conveying effect requires our attention. In this article, based on the practice of selecting engineering equipment, we simulated several situations such as $d/D=0.25$, $d/D=0.35$, $d/D=0.4$, $d/D=0.5$, where d represents the inner pipe diameter and D represents the outer pipe diameter. Each opening structure of the inner tube is equipped with a throttling orifice plate, and the size of the orifice plate plays a very important role in airflow disturbance. We simulated three different opening diameter ratios $d/D=0.8$, $d/D=0.6$, and $d/D=0.3$ in numerical simulation to study their impact effects.

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Analysis of Endoscopic Treatment Methods for Colonic Polyps

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Abstract: Endoscopic treatment of colonic polyps stands as a reliable and effective method for managing these common gastrointestinal growths. This study delves into a comprehensive exploration of the various techniques employed in endoscopic treatment, shedding light on their individual and combined efficacy in addressing colonic polyps of varying sizes and morphologies. Researchers have tirelessly investigated the utilization of endoscopic approaches, such as polypectomy, endoscopic mucosal resection (EMR), and endoscopic submucosal dissection (ESD), all tailored to the specific characteristics of the polyp in question. These methods have exhibited their effectiveness in achieving complete polyp removal while minimizing the risk of recurrence. In conclusion, this investigation contributes valuable insights into the multifaceted realm of endoscopic treatment for colonic polyps. It reaffirms the safety and efficacy of these procedures while offering a nuanced understanding of their nuances and potential challenges, thereby aiding clinicians in making informed decisions regarding patient care.

Keywords: Colonoscopy, Colonic polyps, Endoscopic treatment complications.

1. INTRODUCTION

Colonic polyps are localized protrusions of mucosal tissue into the colon's lumen. They can take various forms and are collectively referred to as colonic polyps until their pathological nature is determined. Their incidence increases with age, with a higher prevalence in males. Polyps are mainly classified into two types: inflammatory and adenomatous. They tend to appear more frequently in middle age, with an occurrence rate ranging from 25% to 80%. Due to their often-asymptomatic nature, colonic polyps can be overlooked or misdiagnosed. As the condition progresses, patients may experience symptoms such as abdominal bloating, diarrhea, rectal bleeding, and mucous discharge. Without timely medical attention, colonic polyps can escalate to colorectal cancer, posing a serious threat to patient safety.

Inflammatory polyps can disappear on their own after the inflammation resolves, whereas adenomatous polyps typically do not regress and have a tendency to become malignant. The most effective method for detecting polyps and determining their nature is regular full colonoscopic examinations, including pathological analysis, and intervening under endoscopy [1]. Polyps

can occur as singular growths or as multiple, sometimes numbering in the dozen or more. Their incidence increases with age, and they are often discovered during routine colonoscopy screenings when there are no specific symptoms.

Under endoscopy, Yamada's protruding lesions are classified into four types based on their morphologies, irrespective of their nature: Type I (broad-based flat polyps) – dome-shaped with a smoothly elevated base and indistinct borders; Type II (sessile polyps) – semi-spherical with a clearly defined base; Type III (pedunculated polyps) – having a stalk, with a slightly smaller elevated base forming a peduncle; and Type IV (pedunculated polyps) – having a stalk, with a distinctly elongated base. [2]

2. LANDSCAPES OF COLONIC POLYPS

Based on the morphology of the polyps, the following treatment methods are employed: 1) Cold polypectomy, 2) Argon plasma coagulation (APC), 3) High-frequency loop snare resection, and 4) Endoscopic mucosal resection (EMR).

Cold polypectomy is a non-electrocautery method for removing polyps and can be divided into two approaches: Cold snare polypectomy (CSP) using a snare and Cold forceps polypectomy (CFP) using forceps. CSP with a snare is a safe and effective technique for removing small polyps (<10mm) under endoscopy. It is particularly suited for polyps without stalks and in the size range of 4mm to 6mm. Compared to electrocautery, it carries no risk of potential perforation. It is recommended to extend the snare's range to encompass the surrounding normal mucosa. CFP with forceps is the most commonly used method for removing tiny polyps (≤ 5 mm). However, incomplete removal rates are reported to be relatively high. Recent randomized studies suggest that CSP is most suitable for polyps sized 1-3mm, and complete removal can be achieved through 1 or 2 consecutive snaring attempts. In summary, CSP is indicated for polyps smaller than 10mm and adenomas diagnosed before the procedure. Emphasizing pre-procedural imaging and magnification for accurate diagnosis is recommended after ruling out cancer. In addition to snare-based CSP, CFP using forceps is also part of cold polypectomy options. In two randomized controlled trials (RCTs) comparing CSP and CFP for polyps smaller than 5mm and 7mm, CSP exhibits a higher complete removal rate than CFP, making CSP the recommended choice. On the other hand, a single-

center prospective trial involving CFP for adenomatous polyps below 3mm showed a 100% complete removal rate. Considering the simplicity of the technique and specimen retrieval, CFP is allowed for polyps below 3mm. [3-4] In such cases, larger forceps with a diameter greater than that of standard biopsy forceps are recommended.

APC Procedure: Argon Plasma Coagulation (APC) is a treatment method that uses a high-frequency electric current conducted through a stream of argon gas ions to thermally coagulate tissue without direct contact. Under the influence of high-frequency and high-pressure conditions, argon gas is ionized into argon gas ions, which possess excellent electrical conductivity, enabling the continuous transmission of electric current. Argon gas itself is inert and can lower the temperature at the surgical site, reducing oxidative and charring damage to tissues and minimizing the production of smoke and eschar during surgery. APC also offers non-contact usage, avoiding probe adhesion, shortening treatment time, maintaining a relatively constant coagulation depth, enhancing treatment safety, and reducing the likelihood of complications such as perforation. It provides rapid hemostasis, allowing for extensive hemostasis in a short period, resulting in uniform scab formation. [5] Importantly, APC does not damage metal stents and can be used for treatment even after stent implantation. It is suitable for polyps with a diameter less than 0.5 cm that have a broad base or are flat in shape.

High-Frequency Loop Snare Resection: This method is suitable for several scenarios: For pedunculated or sessile polyps, direct snaring and high-frequency electrocautery can be used. For pedunculated polyps or larger polyps with a broad base, submucosal injection is performed first, followed by snaring and resection. For polyps with a thick stalk, nylon ligation can be used before snaring and resection. After resection, the wound is sealed with metal clips, and the specimen is retrieved.

Endoscopic Mucosal Resection (EMR) is a surgical procedure performed under endoscopy to completely remove the affected mucosa. It is a treatment method that has developed from a combination of endoscopic polypectomy and endoscopic submucosal injection, and it falls under the category of elective diagnostic or curative surgery. The surgery aims to diagnose and treat mucosal lesions by removing a large piece of the mucosa, including submucosal tissue if necessary. EMR is suitable for polyps with a diameter greater than 2.0 cm and those with a broad base or a thick stalk. Initially, a hypertonic solution is injected into the base of the polyp, causing it to lift, and then a snare is used to perform electrocautery resection. For larger polyps that cannot be completely snared in one attempt, they are removed in sections starting from the top until the base of the polyp is exposed, and then complete removal is performed.

3. POSTOPERATIVE MANAGEMENT AND COMPLICATIONS

Once the initial period of observation passes without any abnormal occurrences, a gradual re-introduction of nourishment is recommended. However, this re-entry into the world of sustenance should be marked by caution, with a preference for easily digestible and bland foods. This gentle approach acknowledges the sensitized state of the gastrointestinal system post-procedure and seeks to alleviate any undue stress on it. This delicate balance of nurturing the body back to equilibrium while steering clear of exacerbating complications embodies the essence of post-procedural care.

For patients harboring larger polyps, the story extends beyond mere nutritional considerations. The management of these cases involves an additional layer of complexity due to the risk of post-procedural bleeding. Bleeding takes center stage as the most prevalent complication. Its manifestation unfolds temporally, with immediate bleeding occurring either during the procedure or immediately after polyp removal. Root causes trace back to procedural intricacies, encompassing factors such as snare tightness, force exertion, coagulation adequacy, and current intensity. The recourse to address this issue involves immediate endoscopic hemostasis, a strategic maneuver that is integral to curbing bleeding and safeguarding patient well-being.

Delayed bleeding, on the other hand, unfurls within 24 hours of the procedure and typically transpires around 3-7 days post-procedure. This delay may be attributed to a multitude of factors, ranging from excessive coagulation depth or area to untimely scab shedding due to inadequate dietary measures or physical activity. Pre-existing conditions such as hypertension, arterial sclerosis, or coagulation disorders can also influence the onset of delayed bleeding. In such instances, the therapeutic toolkit includes both conservative measures and endoscopic hemostasis, each serving as a line of defense against this complication.

Perforation emerges as a formidable adversary in the realm of complications, underscoring the gravity of meticulous procedural execution. Although the risk can be mitigated through careful operation, the specter of perforation persists. While Endoscopic Mucosal Resection (EMR) is relatively sparing in this regard, Endoscopic Submucosal Dissection (ESD) can wield a perforation rate as high as 10%. The triggers for this complication include snaring proximity to the intestinal wall, intensified coagulation, and prolonged electrical current application. A symphony of measures, including adherence to proper technique, circumspection in snaring and coagulation, appropriate cutting point selection, and duration of application, culminate in the avoidance of perforation risks. Moreover, meticulous verification of snare tightness plays a pivotal role in precluding this complication.

In the intricate landscape of post-procedural complications, serosa tear and serositis present as challenging adversaries. These complications are a testament to the delicate interplay between procedural intricacies and patient responses. High-heat damage during electrocautery and submucosal injection-induced mucosal injury underpin these complications, requiring immediate action. A multi-pronged approach encompassing fasting, fluid supplementation, and the strategic administration of antibiotics serves as the therapeutic cornerstone in tackling these complexities. Submucosal emphysema, an intriguing yet transient complication, makes an appearance in the realm of argon plasma coagulation. It arises from repeated coagulation or excessive gas pressure, creating pockets of trapped gas beneath the mucosa. This intriguing phenomenon typically unfurls within 3-5 days and tends to self-resolve, underscoring the body's innate ability to heal.

4. RISING INCIDENCE OF COLORECTAL CANCER

A substantial portion of these cases finds their origins in the transformation of seemingly innocuous entities: colonic polyps. These small, localized protrusions of mucosal tissue into the colonic lumen have garnered increasing attention due to their potential to evolve into malignant tumors, ultimately contributing to the alarming rise in colorectal cancer cases.

The transformation from a benign polyp to a malignant tumor is a crucial point of concern, warranting focused exploration. Among the myriad forms that colonic polyps can assume, those surpassing a diameter of 2.0cm emerge as particularly noteworthy. Their larger dimensions appear to correlate with an escalated propensity for malignancy. This connection between size and malignancy underscores the importance of vigilance when it comes to polyps of larger dimensions. Histology emerges as another pivotal aspect in the predictive calculus of malignant transformation. Colonic polyps exhibiting villous histology, characterized by finger-like projections of cells, seem to be intrinsically predisposed to malignant changes. This histological characteristic serves as a harbinger of the transformation journey, flagging the need for enhanced surveillance and proactive measures.

Within the realm of colonic polyps, certain growth patterns and structural attributes stand out as potential indicators of impending malignancy. The presence of atypical growth, characterized by deviations from the norm in terms of size, shape, or appearance, raises a red flag in terms of malignant potential. Furthermore, broad-based adenomas, where the polyp's attachment to the mucosa spans a wider area, have been correlated with heightened malignancy rates. These nuances in growth and structure emphasize the intricate interplay between morphological characteristics and underlying pathology, shedding light on the complexities that govern malignant transformations.

Against this backdrop of escalating colorectal cancer incidence, a crucial realization emerges: proactive management of colonic polyps is not just prudent but paramount. The specter of malignancy looms large, and the journey from polyp to tumor demands focused attention and strategic intervention.

The pivotal role of proactive management is underscored by the fact that colonic polyps, if identified and addressed at an early stage, can be effectively managed before they assume malignant proportions. Regular screenings and comprehensive colonoscopic examinations emerge as the cornerstones of this approach. By delving into the depths of the colonic mucosa and scrutinizing polyps at their inception, healthcare professionals gain invaluable insights into their nature and potential trajectory. This allows for informed decision-making and tailored interventions that can mitigate the risk of malignancy. The importance of proactive management is further accentuated by the intricate relationship between polyps and age. The prevalence of these growths increases with advancing age, making timely intervention all the more critical. As individuals journey through the various stages of life, the proactive management of colonic polyps becomes a powerful tool in the arsenal against colorectal cancer. Furthermore, the pivotal role of patient awareness and education cannot be overstated. Empowered patients who understand the significance of regular screenings and the potential implications of colonic polyps are more likely to engage actively in their healthcare journey.

5. CONCLUSIONS

In conclusion, the surge in colorectal cancer incidence demands a paradigm shift in how we perceive and manage colonic polyps. These seemingly innocuous growths possess the potential to evolve into malignant tumors, creating a pressing need for proactive management.

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Research on Android process working principle

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Abstract: We call traditional applications process-oriented development, so in Android, we do component-oriented development. As can be seen from the previous content, the jump and communication between Android components are carried out under the premise of third-party intervention. This article explains how Android processes work.

Keywords: Android, Process, Thread

1. PROCESS OVERVIEW

In the development of most other platforms, each developer has a very clear understanding of the process model of their application. For example, a console program, you can imagine that it starts a process from the main function, and at the end of the main function, the process finishes execution and exits; In UI programs, there is usually a message loop running, and when you receive the Exit message, exit the message loop to end the process. In the process of running the program, what process is started, and third-party processes for communication and so on, each developer is as clear as a mirror account. Process boundaries, here, are like national boundaries, and each crossing leaves a deep imprint. [1]

In Android applications, developers can directly perceive tasks. What is clear is the component boundary, and the process boundary becomes elusive, and there is even process hosting. Android not only deprives the power of manual forging memory, but also the power and responsibility of manual handling process, and does not hesitate to monopolize. the two components of the Android process are generally not directly connected (the communication of the Service does not require the intervention of a third party, so Android assumes that it all crosses the process boundary and uniformly communicates based on RPC, which is also to hide the process details...). [2] In which whether the process boundary is crossed becomes unimportant. Therefore, if at this time, developers also need to pay attention to the process, it will become very strange, very inexplicable, simply, Android will host all the process together, the upper layer does not need to know the process of life and death and communication details.

2. FEATURES OF THE UNDERLYING ANDROID PROCESS

At the bottom of Android, the process constructs a running pool at the bottom. Not only the Activity

components in the Task, but also the other three components, Service, Content Provider, and Broadcast Receiver, are all housed in a process at the bottom for operation. Here, the process is more like a resource pool (the concept is like a thread pool, the upper layer takes one out when it wants to use it, and doesn't care which one it takes...). Only to carry the operation of each component, and the direct logical relationship of each component, they do not care about. But we can imagine that in order to ensure integrity, Android will definitely prefer to throw the components of the same Task and the same application into the same process by default, but of course, for efficiency reasons, Android also allows developers to configure. [3]

In Android, the overall (will affect the individual components of it...) And the following components, you can set properties, the same properties of the components will be thrown into the same process to run. the most common use case is to cram different related applications into a process through the configured process attribute so that they can live and die together. There is also the component that often communicates with a Service component, into the same process, because communication with Service is an intensive operation, go RPC, the overhead is not small, through configuration, can become a direct reference in the process, the consumption is quite small. In addition to properties, different components also have special configuration items, such as Content providers (configuration through items...). the default value of the mutiprocess attribute is false, which means that the Content Provider only constructs an instance in the process of the application that provides the component, and third parties need to transfer the data through RPC if they want to use it. This mode is very suitable for cases where the construction cost is high and the data transmission cost is low, and may improve the caching effect. However, if the data transfer is large, or if you want to improve the efficiency of the transfer here, you need to set mutiprocess to true, so that the Content Provider constructs an instance in each process that calls it, avoiding the overhead of process communication.

3. HOW THE ANDROID PROCESS WORKS

The Android system helps developers to host the process, so there is a complex set of algorithms to perform the recycling logic. the life and death of each process in Android is closely related to the various

components running in it, and the processes are placed into a priority system according to the characteristics of their components, and when they need to be recycled, they are recycled from low priority to high priority. Android processes are divided into five priorities: Foreground Process, Visible Process, Service Process, Background Process, and Empty Process. As the name suggests, it is not difficult to see that this shows that the more closely connected with the user's operation, the more it is interacting with the user, the higher the priority, the more difficult to be recycled.

With priority, there also needs to be a good recycling time. Recycle too early, the cache hit probability is low may cause the continuous creation process to destroy the process, the advantages of the pool are gone; Recycling too late, the overall cost is large, the system operation efficiency is reduced, and the good Ferrari may be ruined into a QQ classic car. Android process recycling, the most important thing is to consider the memory cost, as well as power and other resources, in addition to the number of components carried by each process, the number of processes opened by a single application and other quantitative indicators, is also an important sign as a measurement. In addition, some runtime time overhead is also strictly monitored, and starting slow processes will be forced to kill. Android periodically checks the above parameters, and also attempts to recycle at points in time when process recycling is likely to occur, such as after a component has completed execution.

From the user experience point of view, the Android process mechanism, there will be a very gratifying side, some procedures start slowly, but under the premise of abundant resources, you repeatedly quit and use, then the start becomes extremely fast (the process is not dead, just from the background to the foreground), which is thanks to the process hosting. Of course, the other side of the happy is sad, Android's hosting algorithm, but also from time to time to show its naive side, clearly the user has obviously felt the operating system running speed down, open the task manager to see, a number of applications are still alive and jumping, must manually help them end their lives to find the grave, This makes Task Manager a virtual must-have for Android.

From a development point of view, the Android process mechanism has liberated the hands and feet of developers. Developers do not need to carefully construct a background process secretly and silently monitor a certain time, and try to use a variety of guardian means to forge their own process as if not dead birds in general, the problem of process life and death has been in principle within the scope of ordinary developers need to manage. But at the same time, as with the GC and human memory management controversies, all developers don't believe that algorithms can do anything more efficiently or better than they can. But I have always believed that all efficiency advantages will disappear with the

continuous improvement of algorithms and hardware, only the simplicity of the development model will not change over time.

In the development of most other platforms, each developer has a very clear understanding of the process model of their application. For example, a console program, you can imagine that it starts a process from the main function, and at the end of the main function, the process finishes execution and exits; In UI programs, there is usually a message loop running, and when you receive the Exit message, exit the message loop to end the process. In the process of running the program, what process is started, and third-party processes for communication and so on, each developer is as clear as a mirror account. Process boundaries, here, are like national boundaries, and each crossing leaves a deep imprint.

In Android applications, developers can directly perceive tasks. What is clear is the component boundary, and the process boundary becomes elusive, and there is even process hosting. Android not only deprives the power of manual forging memory, but also the power and responsibility of manual handling process, and does not hesitate to monopolize.

Of course, Android hides process details, not deliberately, but naturally. If we call traditional applications process-oriented development, then in Android we do component-oriented development. As can be seen from the previous content, the jump and communication between Android components are carried out under the premise of third-party intervention, and because of this intervention, the two components generally do not have direct contact (communication with Service does not require third-party intervention, so Android assumes that it is all through the process boundary. Unified RPC based communication, so, but also to hide the process details...) In which whether the process boundary is crossed becomes unimportant. Therefore, if at this time, developers also need to pay attention to the process, it will become very strange, very inexplicable, simply, Android will host all the process together, the upper layer does not need to know the process of life and death and communication details.

At the bottom of Android, the process constructs a running pool at the bottom. Not only the Activity components in the Task, but also the other three components, Service, Content Provider, and Broadcast Receiver, are all housed in a process at the bottom for operation. Here, the process is more like a resource pool (the concept is like a thread pool, the upper layer takes one out when it wants to use it, and doesn't care which one it takes...). Only to carry the operation of each component, and the direct logical relationship of each component, they do not care about. But we can imagine that in order to ensure integrity, Android will definitely prefer to throw the components of the same Task and the same application into the same process by

default, but of course, for efficiency reasons, Android also allows developers to configure.

In Android, the overall (will affect the individual components of it...) And the following components, you can set properties, the same properties of the components will be thrown into the same process to run. the most common use case is to cram different related applications into a process through the configured process attribute so that they can live and die together. There is also the component that often communicates with a Service component, into the same process, because communication with Service is an intensive operation, go RPC, the overhead is not small, through configuration, can become a direct reference in the process, the consumption is quite small. In addition to properties, different components also have special configuration items, such as Content providers (configuration through items...). the default value of the mutiprocess attribute is false, which means that the Content Provider only constructs an instance in the process of the application that provides the component, and third parties need to transfer the data through RPC if they want to use it. This mode is very suitable for cases where the construction cost is high and the data transmission cost is low, and may improve the caching effect. However, if the data transfer is large, or if you want to improve the efficiency of the transfer here, you need to set mutiprocess to true, so that the Content Provider constructs an instance in each process that calls it, avoiding the overhead of process communication.

Since the Android system helps the developer host the process, there needs to be a complex set of algorithms to perform the recycling logic. the life and death of each process in Android is closely related to the various components running in it, and the processes are placed into a priority system according to the characteristics of their components, and when they need to be recycled, they are recycled from low priority to high priority. Android processes are divided into five priorities: Foreground Process, Visible Process, Service Process, Background Process, and Empty Process. As the name suggests, it is not difficult to see that this shows that the more closely connected with the user's operation, the more it is interacting with the user, the higher the priority, the more difficult to be recycled. Specific details, see: [guide/switchable-viewer/fundamentals.html#proclife](#).

With priority, there also needs to be a good recycling time. Recycle too early, the cache hit probability is low may cause the continuous creation process to destroy the process, the advantages of the pool are gone; Recycling too late, the overall cost is large, the system operation efficiency is reduced, and the good Ferrari may be ruined into a QQ classic car. Android process recycling, the most important thing is to consider the memory cost, as well as power and other resources, in addition to the number of components carried by each

process, the number of processes opened by a single application and other quantitative indicators, is also an important sign as a measurement. In addition, some runtime time overhead is also strictly monitored, and starting slow processes will be forced to kill. Android periodically checks the above parameters, and also attempts to recycle at points in time when process recycling is likely to occur, such as after a component has completed execution.

4. CONCLUSIONS

From the user experience point of view, the Android process mechanism, there will be a very gratifying side, some procedures start slowly, but under the premise of abundant resources, you repeatedly quit and use, then the start becomes extremely fast (the process is not dead, just from the background to the foreground), which is thanks to the process hosting. Of course, the other side of the happy is sad, Android's hosting algorithm, but also from time to time to show its naive side, clearly the user has obviously felt the operating system running speed down, open the task manager to see, a number of applications are still alive and jumping, must manually help them end their lives to find the grave, This makes Task Manager a virtual must-have for Android.

From a development point of view, the Android process mechanism has liberated the hands and feet of developers. Developers do not need to carefully construct a background process secretly and silently monitor a certain time, and try to use a variety of guardian means to forge their own process as if not dead birds in general, the problem of process life and death has been in principle within the scope of ordinary developers need to manage. But at the same time, as with the GC and human memory management controversies, all developers don't believe that algorithms can do anything more efficiently or better than they can. But I have always believed that all efficiency advantages will disappear with the continuous improvement of algorithms and hardware, only the simplicity of the development model will not change over time.

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Development and Application of New Composite Materials Based on Straw

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Abstract: With the increasing global focus on sustainable development, the need for environmentally friendly materials is becoming more and more urgent. As a kind of agricultural waste, the potential utilization value of straw has attracted much attention. The conversion of straw into new composite materials with high added value has become one of the hot spots in current research. This paper aims to discuss the development and application of new straw-based composites. Designed to provide an environmentally friendly and economically viable material option.

Keywords: straw; new composite materials; Exploitation; apply

1. INTRODUCTION

With the increase of global population and the continuous advancement of industrialization and urbanization, traditional material resources are facing increasing tensions, and the urgent need for renewable and sustainable materials has become more and more obvious. Straw is a by-product of agricultural production, which is produced in large quantities and is often incinerated, resulting in environmental pollution and waste of resources.

2. RESOURCE UTILIZATION AND CHARACTERISTICS OF STRAW

2.1 Straw resource utilization methods

Straw is the residue left behind after harvesting crops and is currently mainly disposed of by incineration or composting. However, with the improvement of environmental awareness and the requirements of sustainable development, the resource utilization of straw has become the focus of people's attention.

(1) Biomass energy utilization

The utilization of straw as a biomass energy raw material can be converted through gasification, fermentation and other technologies. Among them, gasification is the reaction of straw with oxygen or steam at high temperature conditions to produce synthetic gas, which is then used for power generation or heating. Fermentation is the microbial decomposition of straw to produce combustible gases such as methane for energy use [1]. In addition, straw can also be made into biomass pellets or biomass fuel oil through processing methods such as compression and granulation, which can be used to replace traditional fuels and reduce dependence on fossil fuels.

(2) Utilization of chemical raw materials

Chemical components such as cellulose, hemicellulose and lignin in straw can be used to extract cellulosic ethanol and other chemicals. Cellulosic ethanol is an important biofuel with a wide range of applications in automotive fuels, solvents and chemical feedstocks. In addition, straw can also extract propylene glycol, acetic acid and other chemicals, which are widely used in the chemical field.

(3) Manufacturing industry utilization

After crushing and processing, straw can be used to manufacture pulp, paper, plate, building materials and other products. The straw fiber is slender and has a high cellulose content, which is suitable for manufacturing high-quality paper and pulp. In addition, straw can be processed and used to make boards such as cardboard and joinery, as well as ecological building materials.

(4) Utilization of soil amendments

Straw can be obtained by composting as an organic fertilizer or soil amendment. Straw is composted by mixing with other organic wastes and decomposing under the action of microorganisms to produce organic fertilizer. Organic fertilizers are rich in organic matter and nutrients, which can improve soil fertility, improve soil structure and permeability, promote crop growth and soil conservation. At the same time, straw as a soil amendment can improve pH, maintain soil moisture, reduce soil erosion and other problems.

2.2 Characteristics and potential of straw

(1) Abundant resources

Straw is a by-product of crops that is produced in large quantities each year, with a wide range of sources and abundant supply potential. The effective use of straw resources can give full play to its economic and social benefits.

(2) Renewability

Straw is a renewable resource, and proper disposal can make it recyclable, reducing dependence on traditional energy sources and materials. Compared to non-renewable resources, the use of straw is conducive to sustainable development and resource recycling [2].

(3) Environmental friendliness

The recycling of straw can reduce environmental pollution caused by incineration and landfill, and reduce greenhouse gas emissions. Compared with the use of traditional energy, straw utilization is more environmentally friendly and helps to improve environmental quality.

(4) Diverse ingredients

Straw is rich in cellulose, hemicellulose, lignin and other components, and valuable chemicals or manufacturing materials can be extracted through different processing techniques. These components can be applied to biofuels, chemical raw materials, pulp and paper, building materials and other fields, expanding the comprehensive utilization value of straw.

(5) Substitutability

New straw-based composites can replace traditional materials such as wood and plastic. These new materials have good characteristics and potential market demand, which can meet people's demand for environmentally friendly and high-performance materials and drive the development of related industries.

2.3 Preparation process of new composite materials based on straw

(1) Raw material ratio

Raw material ratio refers to the reasonable determination of the proportion of various raw materials in the mixing process according to the design requirements of composite materials. For the preparation of composite materials, the ratio of raw materials is very important, which directly affects the performance and quality of the final product. Raw material ratio is a key link in the composite material preparation process, which needs to consider the design requirements and characteristics of different raw materials, and determine the optimal ratio through testing and adjustment to meet the requirements of product performance and quality.

(2) Molding treatment

Hot pressing, hot molding, and extrusion are common processes used to prepare composite materials, where mixed raw materials are molded to form the desired composite structure [3]. These process methods can effectively mold the mixed raw materials into the desired composite structure, which has the advantages of fast molding speed, high shape complexity, and can achieve mass production.

(3) Curing treatment

Molded composites can be cured to improve their mechanical properties and durability, and common curing methods include heat curing and adding curing agents. Through curing, the internal molecular structure of the composite can be rearranged and crosslinked, so that the mechanical properties of the material such as strength, stiffness and heat resistance are improved.

(4) Surface treatment

As needed, the surface of the composite material is treated, such as sanding, spraying, etc., to improve the finish and aesthetics of the material. When performing surface treatment, material properties, usage environment and actual needs need to be considered, and correct operating procedures and safety precautions are followed to ensure the desired surface treatment.

3. PERFORMANCE CHARACTERISTICS OF NEW COMPOSITE MATERIALS BASED ON STRAW

3.1 Strength and stiffness

The new straw-based composite material has high strength and good stiffness. As a plant fiber, straw has high tensile strength and compressive strength, and it is also a natural fiber with good toughness. By compounding the straw with a suitable resin, the overall strength and stiffness of the material can be effectively increased, making it suitable for a variety of structural applications.

3.2 Thermal conductivity and electrical conductivity

The new straw-based composite material has low thermal and electrical conductivity. Due to the good thermal insulation performance of the straw itself, the conduction speed of heat and current can be effectively reduced by introducing insulating materials into the composite material [4]. This feature makes straw-based composites have a good advantage in some applications that require thermal insulation and insulation.

3.3 Moisture resistance

The new straw-based composite material has good moisture resistance. The surface of straw fiber has a certain hydrophilicity and can absorb moisture, but through surface treatment or suitable resin modification, the water absorption performance of straw material can be effectively reduced, and its stability and durability can be improved. Therefore, straw-based composites can maintain good performance in humid environments.

3.4 Degradability

The new straw-based composite material has good degradable properties. As a natural fiber, straw has good biodegradability, can be decomposed by microorganisms under certain conditions and returned to nature, without causing pollution to the environment. This characteristic makes straw-based composite materials have great advantages in sustainable development and environmental protection, can replace traditional non-degradable materials, and have potential wide application prospects in some application fields.

4. APPLICATION FIELDS OF NEW COMPOSITE MATERIALS BASED ON STRAW

4.1 Construction field

New straw-based composites have a wide range of applications in the construction sector. It can be used as a wall, roof, floor and other structural materials, with good strength and rigidity, while having good thermal insulation and thermal insulation performance, can effectively reduce energy consumption, and improve the energy efficiency of buildings.

4.2 Automotive industry

New straw-based composites also have a wide range of application potential in the automotive industry. It can prepare automotive parts, such as body, interior parts

and door panels, which have good strength, weight and sound absorption performance. This not only reduces the overall weight of the car and improves fuel efficiency, but also reduces noise and vibration and improves driving comfort.

4.3 Packaging Materials

New straw-based composites can be widely used in the field of packaging materials. It can make cartons, paper bags, packaging boxes, etc., with certain pressure resistance and tear resistance, and has good degradable performance, which can effectively reduce the impact on the environment. In addition, straw materials can also be made into fresh-keeping packaging materials, which is conducive to maintaining the freshness of food.

4.4 Biomedical field

New straw-based composite materials also have certain application potential in the field of biomedicine. It can be prepared as medical dressings, drug sustained release systems, etc. Straw materials have good degradability and hydrophilicity, can adapt to the needs of human tissues, and reduce environmental impact. In addition, straw materials also have a lower cost and a wide range of sources, which helps to reduce the manufacturing cost of biomedical products.

5 CONCLUDING REMARKS

The new straw-based composite material is a material with broad application prospects and environmentally friendly characteristics. Through the full use of straw, agricultural waste can be recycled, environmental pollution can be reduced, and sustainable development

can be promoted. However, in the process of technology development and application promotion, there are still a series of challenges, such as production costs, process improvement, etc. Therefore, further strengthening research, exploring new synthetic technologies and material application fields, and striving to improve the performance and feasibility of new straw-based composites are of great significance for achieving resource recycling and sustainable development.

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