

A comprehensive review of early gastric cancer research in traditional Chinese and western medicine

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Abstract. Gastric cancer has long held a prominent place among malignant tumors, with the highest mortality rate. The early stages of gastric cancer lack specific symptoms, making early detection challenging. Western medicine often relies on surgical intervention for a cure, but postoperative quality of life is often unsatisfactory. Traditional Chinese medicine (TCM) has shown promising results in the treatment and prognosis of gastric cancer. This article employs literature review and summarization methods to explore the clinical and research progress in the early stages of gastric cancer from both TCM and Western medicine perspectives. The aim is to discuss the necessity of combining TCM and Western medicine for treatment, with the goal of achieving higher cure rates and improved quality of life, thereby developing a more comprehensive treatment approach.

Keywords: Early Gastric Cancer, Malignant Tumor, Integration of Traditional Chinese and Western Medicine, Preventive Treatment

1. Introduction

Gastric cancer has long been one of the most common malignant tumors globally, especially in China, where both the incidence and mortality rates remain high. Despite advances in medical technology improving the treatment outcomes of early gastric cancer, current methods face the dual challenges of increasing cure rates and enhancing quality of life. The diagnosis and treatment of early gastric cancer are complicated due to the lack of specific clinical manifestations, making early detection difficult. In 2000, the age-standardized incidence and mortality rates of gastric cancer were 41.9/32.7 for males and 19.5/15 for females, respectively [1]. By 2005, these rates had decreased to 37.1/28.8 for males and 17.4/13.3 for females. Gastric cancer, which held the top position in tumor mortality rates at the end of the 20th century, had fallen to the third position by 2005 [2]. Research by Zuo Tingting [3] and others found that from 2000 to 2012, the incidence and mortality rates of gastric cancer in urban areas of China remained stable for males and females, while there was an increasing trend in rural areas for males, with little change in females. Adjusted for age, both incidence and mortality rates showed a decreasing trend. The 5-year relative survival rate for gastric cancer from 2003 to 2005 was 27.4% (95% CI: 26.7%–28.1%).

In China, the detection of early gastric cancer relies solely on opportunistic screening [4], with the ideal diagnosis data increasing gradually each year, reaching approximately 10% [5].

In traditional Western medical treatments, although surgical intervention is the main method for curing early gastric cancer, the postoperative quality of life is often suboptimal. Adjuvant treatments such as chemotherapy and radiotherapy come with varying degrees of side effects. Therefore, exploring more effective treatment methods, especially the combination of traditional Chinese and Western medicine, has become a focal point of current research.

Chinese medicine has demonstrated unique advantages in the treatment of early gastric cancer. TCM treatment emphasizes overall regulation and dialectical treatment, which can improve the physiological state and quality of life of patients to some extent. In addition, traditional Chinese medicine has shown potential advantages in reducing the side effects of Western medical treatments.

In conclusion, this article aims to comprehensively review the status of TCM and Western medicine in treating early gastric cancer through literature review and summarization methods. It analyzes the effective approaches to early gastric cancer from the perspective of combining TCM and Western medicine. The purpose is to discuss the necessity and feasibility of combining TCM and Western medicine for the treatment of early gastric cancer, intending to propose a more effective comprehensive treatment approach that leverages the strengths of both disciplines, ultimately improving cure rates and quality of life for patients with early gastric cancer.

2. Classification and Tumor Marker Research in Early Gastric Cancer

The definition of early gastric cancer is based on its distribution range and depth. If the cancer nests are limited to the superficial layers of tissues, such as mucosa or submucosa, or if there is simultaneous infiltration without restriction to its growth size, or the presence of metastasis [6].

2.1. General Classification and Histological Classification

Traditionally, early gastric cancer is generally classified into four types: Type I - tumor protruding growth, Type II - tumor shallow growth, Type III - tumor endogenous growth, and Type IV - tumor invasive growth with lateral spread. The Japan Gastroenterological Endoscopy Society further refined Type II into Type IIA (elevated type), IIB (flat type), and IIC (depressed type) [7]. Subsequently, the Paris classification further divided superficial tumors of the digestive tract into three categories: Type 0~I pedunculated growth (0~IP pedicled growth and 0~Is fixed growth) and 0~II non-polypoid growth type (including IIA mild growth, IIB flat growth, IIIC slight inward growth), and 0~III endogenous growth type [8].

The two most common histological types of early gastric cancer are tubular adenocarcinoma and papillary adenocarcinoma. Based on the major components of cancer tissue, the World Health Organization roughly classified gastric cancer histology into four types in 2010, including the above two types of early gastric cancer. Tubular adenocarcinoma is the most common histological type of early gastric cancer. Papillary adenoma is another pathological malignant transformation commonly found in this disease, often associated with liver and nearby lymph node metastasis.

2.2. Diagnostic Research on Early Gastric Cancer Biomarkers

Currently, markers used for gastric cancer detection can be broadly categorized into serum, protein, urine, RNA, and other types, each with its own specificity for detecting a particular type of cancer and screening for potential precancerous lesions. The basis for this lies in the differential expression rates of relevant tumor markers in immunohistochemistry under different conditions, such as methylated Septin9, MG7, miRNA, etc. Studies, such as that by Kim et al. [9], show that CDX2 has significantly different expressions in low-grade intraepithelial neoplasia, high-grade intraepithelial neoplasia, and intestinal-type gastric cancer, but is not expressed in normal gastric mucosal tissue. In a clinical study on blood markers, miR-101-3p was identified as a potential diagnostic marker for atrophic gastritis (AG) and gastric cancer. The combination of miR-101-3p with gastric pepsinogen I (PG I), PG I/II (AUC = 0.856,

sensitivity of 80.23%, specificity of 77.05%) effectively distinguishes between AG and gastric cancer [10].

In terms of diagnosis, besides tumor markers, other examinations such as endoscopy, imaging, genetics, etc., are also used clinically as diagnostic criteria [11], with numerous research findings contributing to clinical practice.

3. Current Clinical Surgical Techniques for Early Gastric Cancer

The curative effects of early gastric cancer are remarkably significant, with a 5-year average survival rate of up to 90%. However, the major drawback of surgical radical procedures is their direct impact on the postoperative quality of life for patients, making it a recent research focus. Currently, endoscopic resection and modified radical surgery are the most standard solutions for curing early gastric cancer.

3.1. Endoscopic Resection

Endoscopic resection is the current standard treatment for early gastric cancer. Endoscopic mucosal resection (EMR) is indicated for well-differentiated mucosal cancer within 2 cm without ulceration. Endoscopic submucosal dissection (ESD) allows for the complete removal of lesions, with a larger range than EMR and applicable to patients with ulcers [12].

In a comparative study on the efficacy, recurrence, and complications of ESD and EMR [13], experimental data under conditions of randomly assigned variables showed that the ESD group had a higher rate of en-bloc resection than the EMR group. The ESD group also exhibited lower intraoperative bleeding, shorter surgical time, and shorter hospital stay compared to the EMR group. From a data perspective (overall complication rate, recurrence rate, total treatment effectiveness), the ESD group showed rates of 5.71%, 2.86%, and 100%, respectively, while the EMR group had rates of 22.22%, 19.44%, and 88.89%, respectively. The conclusion drawn is that, with statistically significant data ($p < 0.05$), ESD treatment is more significantly effective in treating early gastric cancer in young patients.

3.2. Laparoscopic Surgery

The application of laparoscopic surgery in the clinical treatment of early gastric cancer is increasingly significant. A prospective phase III clinical study demonstrated that laparoscopic surgery is superior to open surgery for early gastric cancer. Based on its safety and effectiveness, it has clear advantages in short-term benefits compared to open surgery [14]. In previous years, laparoscopic wedge resection of the stomach, distal gastrectomy with preservation of the pylorus, and gastrectomy with preservation of sympathetic nerves have been used for early gastric cancer patients without lymph node metastasis.

3.3. Functional Preservation Reduction Surgery

Functional preservation reduction surgery falls between gastrectomy, D2 dissection, and ESD, ensuring both oncological requirements and maximizing postoperative function preservation [15]. Specific methods commonly used in clinical practice include PPG, PG, SG, LR and sentinel lymph node navigation, etc.

4. Current Research Status in Traditional Chinese Medicine

4.1. Disease Naming Recognition

The term "stomach cancer" first appeared in the Qing Dynasty in Zhang Xichun's "Medical Record of Integrating Chinese and Western Medicine." In the section on esophageal obstruction, it states, "Westerners call it stomach cancer, which is like a rock protruding, convex in shape." (西人则名为胃癌,所谓癌者,如山石之岩,其形凸出也) Although the term "stomach cancer" appeared relatively late, many descriptions similar to symptoms and signs of stomach cancer are found in classical Chinese medical literature. Based on clinical symptoms, it is often classified into categories such as stomach pain, esophageal obstruction, subcardiac obstruction, regurgitation, accumulation, etc. [16]. Zhang Xu [17] broadly classifies it under the category of "stomach distension."

4.2. *Understanding of Etiology and Pathogenesis*

Regarding the etiology of gastric cancer, Zhang Shuanhu [18] and Li Weiqiang [19] believe it is related to emotional factors, dietary factors, and infection with dampness and heat toxins. The article "Diagnostic and Therapeutic Ideas of Chinese Medicine for Precancerous Lesions of Gastric Cancer in the Context of Big Health" also adds the impact of external pathogens and regional climate, while Zhang Xu adds the factor of weakness in the spleen and stomach. In terms of pathogenesis, traditional Chinese medicine believes that the essence of gastric cancer is due to deficiency of vital energy, stagnation of toxic substances, belonging to the pattern of deficiency in essence and excess in manifestation. This is mentioned in articles by Ma Shanmei [20] and Lin Cuili [21], and they propose that deficiency in essence is due to weakness in the spleen and stomach, insufficient vital energy, and excess in manifestation is due to blood stasis, phlegm obstruction, and toxic heat. In addition, Professor Hu Bing [22] also proposes factors such as qi stagnation, food accumulation, and dampness.

The research article "Study on the Distribution and Changes of TCM Syndrome Types Before and After ESD in Patients with Early Gastric Cancer and Precancerous Lesions" suggests that external pathogenic factors, especially wind, cold, and dampness, play a major role. In addition, if the spleen and stomach are weakened due to overexertion, loss of body fluid and energy, leading to deficiency of qi and blood, or congenital and elderly weakness, resulting in impaired function, the smooth flow of qi is disturbed, and blood stasis and phlegm accumulation are easily formed, resulting in tumors. This is as explained by Wei Pinkang[23] in the research article "Theoretical and Mechanistic Study on the Relationship between Phlegm and Recurrence and Metastasis of Gastric Cancer": "Tumors are not formed by the solidification of Yin and Yang positive energy but by the stagnation of blood stasis, turbid qi, and phlegm in the five viscera." "From the accumulation of qi to the accumulation of phlegm, the phlegm carries stagnant blood, forming a cyst." (癌瘤者,非阴阳正气所结肿,乃五脏瘀血浊气痰滞而成);“自气成积,自积成痰,痰挟瘀血,遂成窠囊)

4.3. *Differentiation of Syndromes*

Research by Lei Tianhao [24] identified four common clinical symptoms in gastric malignant tumors, occurring frequently, even exceeding 100 occurrences: fatigue, poor sleep, sallow complexion, and poor appetite. Chen Tao [25] and others summarized over 200 articles, categorizing several common syndromes of gastric cancer, including Qi Stagnation and Stasis, Qi Stagnation and Blood Stasis, Disharmony between Liver and Stomach, Damp-Heat Toxin Accumulation, Stomach Heat Injuring Yin, Deficiency of Qi and Blood, Deficiency-Cold in Spleen and Stomach, and Deficiency of Spleen-Kidney Yang. Liu Jiaxiang [26] classified gastric cancer into six syndromes through years of clinical practice: Disharmony between Liver and Stomach, Blood Stasis and Toxin Obstruction, Spleen Deficiency and Phlegm-Dampness, Stomach Heat Injuring Yin, Deficiency of Qi and Blood, and Spleen-Stomach Deficiency-Cold. Yu Rencun [27] further divided gastric cancer into types commonly seen in stage I and II patients, such as Disharmony between Liver and Stomach; types more common in stage II and III patients, such as Spleen-Stomach Deficiency-Cold; types prevalent in stage II, III, and IV patients, such as Damp-Heat and Blood Stasis; and types observed in late-stage III and IV patients, such as Deficiency of Qi and Blood. Wu Wei [28] analyzed data from literature recorded over 8 years in China, summarizing seven common syndromes: Disharmony between Liver and Stomach, Phlegm-Dampness Obstruction, Blood Stasis and Toxin Blockage, Spleen-Stomach Qi Deficiency, Spleen-Stomach Yang Deficiency, Stomach Heat Injuring Yin, and Deficiency of Qi and Blood. Xue Weiwei [29], Dong Zhiping [30], and others, through data mining analysis, compiled seven TCM syndromes widely accepted by senior TCM practitioners nationwide: Spleen-Stomach Qi Deficiency, Phlegm-Dampness Obstruction, Blood Stasis and Toxin Blockage, Disharmony between Liver and Stomach, Stomach Heat Injuring Yin, Spleen-Stomach Deficiency-Cold, and Deficiency of Qi and Blood.

4.4. *Treatment Methods and Medicinal Formulas*

Lin Cuili and others propose that the treatment approach in the context of overall health should focus on supplementing deficiencies and dispelling evils. In "Professor Feng Mingqing's Experience in

Treating Gastric Cancer," it is also emphasized that Professor Feng pays great attention to tonifying the spleen and stomach during clinical treatment. It is believed that tonifying the body's vital energy should be integrated throughout the entire treatment process. The article suggests that tonifying the body is not only beneficial for dispersing nodules but also facilitates the patient's acceptance of other modern medical treatments, improves the patient's constitution, promotes recovery, and prolongs survival [31]. Zhang Xu analyzed various schools' clinical summaries of TCM syndromes in early gastric cancer and concluded that for the spleen-stomach weakness type of gastric cancer, the treatment should mainly focus on tonifying the center and harmonizing the stomach; for the disharmony between the liver and stomach type, the treatment should be based on soothing the liver, regulating qi, and harmonizing the stomach; for the spleen-stomach damp-heat type, treatment should emphasize clearing heat, drying dampness, and harmonizing the stomach; for the stomach collateral stasis type, the treatment should mainly focus on resolving stasis, promoting blood circulation, and harmonizing the stomach; for gastric cancer patients with deficiency of stomach yin, the treatment should mainly focus on nourishing yin and invigorating the stomach.

4.5. Other Traditional Chinese Medicine Treatment Methods for Early Gastric Cancer

After surgery for early gastric cancer, patients inevitably experience symptoms such as loss of appetite and nausea. Lin Liubing [32] and others proposed that traditional Chinese dietary therapy and conventional dietary regulation gradually play a prominent role in addressing this phenomenon. They recommended medicated diets such as Coix Seed and Corn Gruel, Panax Notoginseng Porridge, Ginger and Orange Peel Water, Coix Seed, Lotus Seed, and Chinese Yam Congee, among others. In addition, the traditional Chinese medicine characteristic therapies mentioned in the research article "Study on the Distribution and Changes of TCM Syndrome Types Before and After ESD in Patients with Early Gastric Cancer and Precancerous Lesions" have made significant contributions to the treatment of early gastric cancer. Common methods include acupuncture therapy, ear acupoint pressure beads, and acupoint application.

Fan Ming [33] and others found through a series of research analyses that, compared to the control group, the treatment group showed significant improvement in clinical symptoms and histological efficacy based on clinical syndromes and histological efficacy. This proves that the combination of Chinese medicine and acupuncture can effectively improve the clinical symptoms of patients with precancerous lesions of gastric cancer. Deng Jianmei [34] and others conducted a randomized controlled trial of traditional Chinese medicine combined with ear acupoint pressure beads for the treatment of precancerous lesions of gastric cancer. They found that the treatment group using the oral administration of Shugan Tongluo Fang combined with ear acupoint beads had better clinical efficacy and pathological results than the control group using only oral Gaofuchun tablets, thus demonstrating the visible efficacy achieved through the combination of herbal medicine and ear acupoint pressure beads. Zheng Fengmin [35] and others conducted long-term observations of 128 patients with precancerous lesions of gastric cancer treated with traditional Chinese medicine combined with application and lifting needle embedding. The study found a high effective rate of 93.70%.

5. Conclusion

This section elaborates on the practice of integrating TCM and Western medicine and underscores its necessity. The conclusion drawn by Jing Wen Shan et al. [36] in "Research on TCM Syndromes in the Early Postoperative Period of Gastric Cancer and Its Related Factors" is that the distribution of TCM syndromes is not correlated with patient gender, tumor pathological type, pathological staging, or surgical methods ($P > 0.05$), but it does show correlation with patient age ($P < 0.05$). Currently, the key point of combined Chinese and Western medicine treatment is closely centered around surgery. Different treatment measures and effective herbal techniques are employed at various stages based on the patient's physiological status and needs, aiming to consolidate and maintain the treatment. During the perioperative period, the emphasis is on nourishing Qi and blood, replenishing the Qi of the spleen and stomach to enhance the patient's vital energy, and ensuring the smooth completion of surgery. Xiao

Juan et al. [37] implemented differentiated care for 130 patients undergoing gastric cancer surgery. The control group received routine nursing, while the observation group received additional Chinese nursing techniques, including foot baths, hot fomentation of the abdomen with fennel, massage of Zusanli acupoint, and transdermal ultrasound therapy. The results indicated that the Chinese medicine group had significantly lower scores for the first time of passing gas and the recovery of bowel sounds compared to the control group. This suggests that Chinese medicine intervention can effectively assist in the recovery of gastrointestinal function in gastric cancer surgery patients. In the postoperative and adjuvant chemotherapy periods, the focus is on harmonizing the spleen and stomach, nourishing bodily fluids and Qi to accelerate wound healing, prevent complications, and enhance immunity to alleviate adverse reactions to chemotherapy. This highlights the necessity of traditional Chinese medicine in the postoperative adjuvant treatment and the scientific and effective application of integrative Chinese and Western medicine to improve the cure rate and quality of life for patients with early gastric cancer.

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