

A Brief Overview of Professor Qingbatu's Academic Thoughts on Thyroid Nodules and Analysis of Radiofrequency Ablation Therapy

Yuehai MA^{1,2}, Qingbatu^{1*}

1. Affiliated Hospital of Inner Mongolia Minzu University, Tongliao 028000, China; 2. Inner Mongolia Minzu University, Tongliao 028000, China

Abstract Professor Qingbatu believes that thyroid nodules belong to the "essence undigested disease" of Mongolian medicine, which is caused by the imbalance of three roots and stagnation of qi and blood induced by excessive diet and emotional disorder. The core of treatment is to protect thyroid function, and to achieve "clearing the undigested, dispersing the gathered" by adjusting the three roots, reasonable diet and psychological counseling. As a minimally invasive technique, radiofrequency ablation utilizes local thermal effects to denature and induce apoptosis of nodule proteins, offering advantages such as minimal trauma, rapid recovery, and high safety. Clinical studies have shown significant reduction in nodule volume and effective rate, with a low incidence of complications. The combination of radiofrequency ablation and oral administration of Mongolian medicine is expected to achieve a synergistic effect of local nodule dispersal and systemic regulation, providing a new reference path for the treatment of thyroid nodules.

Key words Professor Qingbatu, Academic thought, Thyroid nodule, Radiofrequency ablation

1 Introduction

Professor Qingbatu is a highly experienced chief physician in the Department of Mongolian Medicine at the Affiliated Hospital of Inner Mongolia Minzu University. He is currently a member of the Inner Mongolia Mongolian Medical Association, a member of the Mongolian Medicine Branch of the National Ethnic Medicine Association, the first demonstration course teacher at Inner Mongolia Minzu University, and the fourth batch of national renowned Chinese (Mongolian) medical experience inheritors. In addition, he also participated in the compilation of the *Mongolian Medical Undergraduate Textbook* and the *Mongolian Medical Encyclopedia*, published more than 20 papers, edited 6 monographs, and joined in 5 scientific research projects. Since 1988, Professor Qingbatu has mainly engaged in surgical medical treatment, teaching, and scientific research. He has accumulated rich experience in the diagnosis and treatment of thyroid, breast, liver, gallbladder, pancreas, and gastrointestinal diseases, and has achieved significant results in the combination of Mongolian and Western medicine in the diagnosis and treatment of thyroid diseases.

The number of patients with thyroid nodules is increasing day by day, and the current clinical treatment trend has shifted from the traditional surgical mode to precise and minimally invasive treatment methods^[1]. Professor Qingbatu pointed out that the incidence rate of thyroid nodules continued to rise, about 90% of patients were accompanied by hypothyroidism, and nodules were mostly benign or low-risk micro papillary carcinoma. Mongolian medicine believes that thyroid nodules belong to the category of "essence undigested disease". Due to the imbalance of the three human roots (Heyi, Xila, Badagan), together with factors such as poor mood, improper diet, and invasion of external evils, the nodules are caused by stagnation of qi and blood. At present, the treatment methods for thyroid nodules include the combination of Mongolian and Western medicine, the combination of Mongolian,

Chinese and Western medicine, and psychosomatic treatment, all of which have certain therapeutic effects^[2–5].

2 Etiology of thyroid nodules

Modern medicine believes that the main causes of thyroid nodules include iodine deficiency, long-term intake of goiter causing substances, genetic factors, gene mutations, age, etc^[6]. Mongolian medicine believes that thyroid nodules are due to the imbalance of yin and yang, liver function decline, and the balance of the three roots and seven elements damaged caused by diet, mood, work and rest, psychological disorders and other reasons, thus affecting the spleen and stomach circulation, causing indigestion, gradually forming "essence undigested", and finally gathering in the neck to form a disease^[7]. Mongolian medicine emphasizes that all internal medicine diseases are caused by "undigested" food, and the normal operation of the digestive process is closely related to the three fire, seven elements, lucidity and turbidity, and the breakdown of waste in the stomach. Therefore, it is the key to preventing diseases from developing into an "undigested" state by maintaining a balance between the three roots and seven elements, and promoting digestion and absorption. "Undigested" can be divided into undigested waste, lucidity and turbidity: undigested waste can be transformed into undigested lucidity and turbidity if not treated in a timely manner. Food can be decomposed into essence and waste after digestion. If the three fires in the stomach can not normally decompose essence, or essence is transported to the thyroid gland and "undigested", it can cause disease. Or because the liver and gallbladder are hot, and Qisu is out of balance with Xila, the hepatic blood metaplasia and the abnormal absorption of essence and waste are caused, the essence cannot be digested, and the amount of Xieriwusu generated from the decomposition of waste in the blood is increased, which accumulates in the thyroid gland and fights with evil blood, thus forming the disease. Traditional Chinese medicine believes that blood stasis and qi stagnation are the basis for the formation of thyroid nodules, and the treatment mainly uses methods to regulate qi and blood^[8]. By clearing stag-

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Yuehai MA, doctoral degree candidate, attending physician. * Corresponding author. Qingbatu, master's degree, chief physician, professor.

nation, improving qi and blood circulation, regulating spleen and kidney, and harmonizing yin and yang, and qi and blood, swelling can be reduced, and nodules can be dispersed^[9].

3 Professor Qingbatu's academic ideas on the treatment of thyroid nodules

Professor Qingbatu believes that thyroid nodules are caused by physiological dysfunction due to long-term overeating, excessive emotional fluctuations and other factors, which affect the digestion and distribution of essence, and then form nodules in the neck. This understanding is similar to the modern medical understanding of the etiology of thyroid nodules. Nodules are classified into toxic, non-toxic, severe, mild, and chronic types, with most of them being chronic in onset. The core of treatment is to prioritize the protection of thyroid function, and improve, regulate, and maintain the balance of Heyi, Xila, and Badagan. During the treatment and nursing process, appropriate psychological counseling should be provided, and it should guide patients to have a reasonable diet and promote the excretion of waste, in order to maintain the balance of qi and blood and achieve the effect of reducing nodules. This approach is highly consistent with the clinical treatment principles of modern Western medicine. In addition, treatment also needs to be administered based on individual differences of patients according to syndrome differentiation. At present, the clinical application of radiofrequency ablation for the treatment of thyroid nodules is mainly aimed at dispersing nodules, which is in line with the external treatment concept of Mongolian medicine of "clearing undigested and dispersing nodules". The combination of radiofrequency ablation technology and oral administration of Mongolian medicine is expected to achieve synergistic effects of local disintegration and systemic functional regulation. At the same time, attention should be paid to the potential negative effects of new therapies, and treatment methods should be selected reasonably based on the severity, urgency, and nature of thyroid nodules.

4 Research status of radiofrequency ablation for the treatment of thyroid nodules

Radiofrequency ablation is a minimally invasive surgical technique that directly targets nodules through local thermal stimulation to achieve therapeutic goals. The principle is to use high-frequency current to excite tissue ions to generate heat, causing denaturation or inducing apoptosis of cellular proteins^[10]. Previous studies have

reported for the first time the good effect of radiofrequency ablation technology in treating benign thyroid nodules. As a thermal ablation method, this technology has gradually become a safe alternative therapy for treating benign thyroid nodules and malignant thyroid nodules that are not suitable for surgery^[11]. Compared with traditional surgery, thermal ablation has the advantages of less trauma, shorter time, and higher safety^[12]. For example, there was a study using microwave ablation to treat benign thyroid nodules, and the efficacy was evaluated through ultrasound. 92 patients were divided into two groups, and the results showed that the observation group had a significantly higher rate of thyroid nodule volume reduction than the control group ($P < 0.05$). After treatment, the incidence of complications in the observation group was 8.7%, significantly lower than the 26.09% in the control group ($P < 0.05$)^[13]. Another study was conducted on 144 patients with Bethesda type V and VI low-risk thyroid nodules. The patients were divided into a paratracheal nodule group and a tracheal distal nodule group according to the location of the lesion. The preoperative and postoperative nodule absorption rates and disease progression were evaluated. The results showed that the paratracheal nodule group had a higher postoperative nodule absorption rate than the control group ($P < 0.05$), and the reduction rate was 1.8 times that of the control group^[14]. In terms of recurrence risk factors, studies have explored the recurrence factors of thyroid nodules after radiofrequency ablation. During the follow-up period, 16 of 120 patients recurred, with a recurrence rate of 13.33%, suggesting that leukopenia, diabetes, retinopathy, *etc.* are risk factors for recurrence, and corresponding preventive measures should be taken^[15]. Another study divided 60 patients with thyroid nodules into two groups and compared indicators such as nodule healing, improvement degree, size, and diameter. The results showed that both groups had significant improvements, but the effective rate of the radiofrequency ablation group was 90.0%, which was higher than the 73.3% of the drug treatment group^[16]. In summary, existing studies have shown that radiofrequency ablation is effective in treating thyroid nodules and can be used as an adjuvant or alternative therapy.

5 Theoretical correlation between radiofrequency ablation and Mongolian medicine therapy

Based on Professor Qingbatu's academic ideas in Mongolian medicine and the research progress of radiofrequency ablation, the theoretical correlation between the two can be summarized in Table 1.

Table 1 Theoretical correlation between radiofrequency ablation and Mongolian medicine therapy

Correlation dimension	Radiofrequency ablation	Mongolian medicine	Integration potential
Cause awareness	Nodule formation is associated with cell proliferation and abnormal local microenvironment	Imbalance of three roots, qi stagnation and blood stasis, phlegm coagulation	Explaining local microcirculation disorders with "qi stagnation and blood stasis" to improve abnormal deposition of extracellular matrix
Treatment objectives	Nodule volume reduction, symptom relief, minimal side effects, and reduced recurrence rate	Regulating overall balance and improving qi and blood circulation	Ablation achieving local lesion clearance, Mongolian medicine improving the "soil" environment for nodule formation
Efficacy evaluation	Imaging indicators, volume reduction rate	Improvement in symptoms, reduction in volume, or decrease in recurrence rate	A comprehensive evaluation system combining objective imaging indicators and subjective symptom improvement

6 Conclusions

At present, radiofrequency ablation technology has achieved good therapeutic effects in the treatment of organ tumors such as liver, kidney, and breast, and also has significant therapeutic effects on thyroid nodules^[17]. With the development of technology and the accumulation of clinical experience, radiofrequency ablation has played an important role in the field of thyroid surgery, providing patients with a new low-cost treatment option and significantly improving their treatment acceptance and quality of life. Compared with traditional surgical treatment, radiofrequency ablation is considered to have the advantages of less trauma, faster recovery, and lower recurrence rate, but its negative effects and recurrence risk still need to be considered^[18]. Some patients refuse the surgery due to concerns about radiation or complications^[19]. Clinical data shows that the effective rate of radiofrequency ablation is over 90%. However, there is currently a lack of high-quality research comparing or combining adjuvant therapy with Chinese, Mongolian, and Western medicine. Some researchers believe that psychotherapy has an impact on thyroid nodules, but the effect is not yet clear^[20–21]. Currently, there are still shortcomings in the radiofrequency ablation treatment of thyroid nodules in terms of multi sample studies, psychological interventions, standardized clinical diagnosis, biological mechanisms, and traditional medical adjuvant therapy. In the future, it will become an important goal of modern clinical diagnosis and treatment by developing standards and clinical guidelines for radiofrequency ablation treatment.

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