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A Case Study of Acupoint Catgut Embedding Therapy for Epilepsy

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Abstract: *Epilepsy is a chronic brain disease caused by abnormal excessive discharge of brain neurons. The global incidence of epilepsy is high, and the prevalence of epilepsy in China is about 5%. At present, there are various treatment methods of western medicine, but the long-term prognosis is difficult to improve due to the heterogeneity of the clinical manifestations of the patients. Acupoint catgut embedding has many advantages in the treatment of epilepsy. The long-term stimulation effect of acupoint catgut embedding can stimulate acupoint function for a long time. The overall regulatory advantage can improve the functional state of the body from multiple systems. The green safety advantage is reflected in the use of absorbable materials, fewer side effects, and avoiding the risk of surgical trauma. The advantages of economy and convenience lie in low cost, simple operation, and reducing the medical cost of patients. A 15-year-old male patient with epilepsy was treated with electroacupuncture and acupoint catgut embedding for 8 weeks. The number of seizures was significantly reduced and the quality of life was improved. However, acupoint catgut embedding has limitations in the treatment of epilepsy. At present, it cannot replace the mainstream therapy, and most of them are used as an auxiliary means. In the future, it is necessary to expand the sample size to further verify its effectiveness, further explore the mechanism of action, and clarify the scope of application, so as to better apply it in the treatment of epilepsy.*

Keywords: *Epilepsy; Acupoint catgut embedding; TCM theory*

1. Introduction

Epilepsy is a group of brain abnormalities caused by repeated, excessive discharge of neurons, leading to the onset and transient dysfunction of the central nervous system. Epilepsy is a chronic brain disease with a persistent tendency [1,2]. Epidemiological studies have shown that epilepsy affects 10% of the world's population at some point in their lives, and about 1-2% of people worldwide suffer from epilepsy. According to surveys, the prevalence of epilepsy in China is about 5%, and the peak incidence occurs in childhood, with the highest incidence between 1-10 years old; it then gradually decreases with age. For other peaks, after 60 years of age, the disease is more common in developed countries. In our country, however, the situation is different [3]. At present, common Western medicine treatments include drug therapy, surgical treatment, neuromodulation, ketogenic diet therapy, etc.[4] However, the clinical manifestations of patients with epilepsy exhibit significant population heterogeneity; this not only reflects regional distribution but also involves cultural and educational background as well as socioeconomic status. These factors together affect both diagnosis accuracy and treatment effectiveness[5] for epilepsy. Therefore, the above treatments can control the condition of epilepsy patients but still struggle to change their long-term prognosis. In recent years, a lot of progress has been made in treating children with epilepsy. A series of external treatments such as acupuncture and moxibustion from traditional Chinese medicine and Catgut-embedding therapy have been developed which illuminate hope for families with children suffering from epilepsy while opening up new treatment paths [6].

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2. The theoretical basis of acupoint catgut embedding therapy for epilepsy

2.1. Understanding of Epilepsy in Traditional Chinese Medicine

2.1.1. Etiology and pathogenesis of epilepsy

Chinese medicine refers to epilepsy as "epileptic syndrome" or "epilepsy," which is characterized by abnormal onset of the disease, sudden falls, confusion, excessive salivation with foaming at the mouth, rolling eyes, and limb twitching. These symptoms are similar to those seen in sheep or pigs. The symptoms of epilepsy have been recorded as early as in Huangdi Neijing (Yellow Emperor's Internal Classic). For example, in Miraculous Shu · Madness, it is noted that "At the beginning of the seizure, the patient feels unhappy and experiences heaviness and pain in the head."When observed, he is found to raise his eyes and see things, and his eyes turn red. After the disease reaches its severe peak, symptoms of irritability immediately appear. These have been described, which laid the foundation [7] for the understanding of epilepsy in later generations. Sun Simiao, a doctor of the Tang Dynasty, divided epilepsy into six categories according to the zangfu classification: cardiac epilepsy, pulmonary epilepsy, hepatic epilepsy, and intestinal epilepsy.He believed that epilepsy was closely related to the heart, liver, and kidney. He also recorded many prescriptions and methods for the treatment of epilepsy in his book Bei Ji Qian Jin Yao Fang (Essential Prescriptions for Urgent Needs of a Thousand Gold), which further developed people's understanding and treatment of epilepsy. In the Ming and Qing Dynasties, Zhang Jingyue pointed out in Jingyue Quanshu · Madness and Dementia that the cause of epilepsy was "It is precisely due to the blockage of phlegm and saliva within the body that a person's pores and orifices become blinded, congested, and obstructed, thereby leading to impaired consciousness," emphasizing the important role of phlegm in the pathogenesis of epilepsy. The etiology of epilepsy can be summarized as congenital factors, endogenous phlegm, emotional disorders, and brain damage. Qi Bing Lun of Plain Questions said, "People are born with epilepsy... This condition is sometimes referred to as a congenital disease. This is because when the fetus is still in the mother's womb, if the mother experiences extreme fear, it can cause her qi to rise instead of descending. The mother's panicked and rebellious qi conflicts with fetal qi, leading to their interaction and aggregation. As a result, the child may be born with a predisposition to epilepsy." [8].It indicates that pregnant women who are frightened during pregnancy may experience abnormal development of the fetus, fetal air damage, and epilepsy after birth. The Song Dynasty Chan theory emphasizes the important role of phlegm in epilepsy, stating that "three poles correspond to a disease." During the Jinyuan period, it was proposed by Brook that "no phlegm means no epilepsy," enriching the understanding of the causes of epilepsy and advocating for treating phlegm first. In the book Epilepsy Narrative on Three Causes and One Disease Syndrome Prescription, it is stated: "Epilepsy is a kind of disease. Due to fear and stimulation, the qi, blood, Yin, and Yang in the zang-fu organs become unbalanced," indicating that emotional stimuli such as panic can cause an imbalance of qi in the human body, thus leading to epilepsy. In the Ming Dynasty, Lu Bosi mentioned in Ying Tong Baiwen · Jing Xian that "Blood stagnates in the hole; pathogenic wind invades the heart; long-term accumulation of panic eventually leads to epilepsy." [9]. He believed that blood stasis in the brain, coupled with the invasion of evil wind into the heart, could easily accumulate and lead to epilepsy, indicating that the onset of epilepsy was related to blood stagnation in the brain.

2.1.2. Treatment of epilepsy based on syndrome differentiation

(1) Syndrome differentiation based on phlegm.

Since ancient times, most doctors have believed that the occurrence of epilepsy is closely related to "phlegm." For example, in Danxi Xinfa · Epilepsy, it is stated: "Epilepsy is merely the accumulation of phlegm and saliva, which can obscure and agitate the mind." In works such as "Introduction to Medicine," whether epilepsy is classified as positive or negative, the critical factor lies in the presence of phlegm in the body. This clearly illustrates that phlegm is key to causing seizures; it blinds judgment and leads to madness. The book Xianbing Zheng Zhi Hui Fu mentions that "The situation involving phlegm and fire in epilepsy arises from dietary indiscretion, which impairs the spleen and stomach, leading to the accumulation of phlegm and fluid. Phlegm and fluid then rise upward with qi, obstructing the meridians and clouding the heart orifice."It elaborates on the process of improper diet damaging the spleen and stomach, leading to the formation of phlegm and fluid, which is reversed along with the qi, ultimately resulting in epileptic seizures. It details how an improper diet damages the spleen and stomach, leading to the accumulation of phlegm and fluid retention. This phlegm and fluid then rises with the qi, ultimately causing epileptic seizures. It emphasizes that phlegm and pathogenic factors induce epilepsy by obstructing the meridians, disturbing the mind, and blocking the clear orifices. Professor Liu Zuyi posits that epilepsy results from dysfunction of the zang-fu organs, impaired qi circulation, and abnormal

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distribution of body fluids, which in turn leads to endogenous phlegm-dampness obstructing the clear orifices. The deficiency of the spleen, liver, and kidney contributes to forming phlegm—a primary cause of epilepsy.Consequently, the accumulation of "phlegm" in the body blocks the meridians, thereby triggering epileptic seizures. Furthermore, prolonged stagnation of phlegm forms stubborn condensations that are difficult to resolve, resulting in persistent epilepsy over extended periods [10].

(2) Syndrome differentiation from blood stasis

For an extended period, the theory of "blood stasis causing epilepsy" has been largely overlooked by physicians. In “Yixue Xinwu: Diankuang Xian,” it is explicitly stated that qi stagnation and blood stasis constitute one of the primary etiological factors of epilepsy. Furthermore, “Ying Tong Baiwen: Epilepsy” provides a theoretical foundation for treating epilepsy through promoting blood circulation and resolving blood stasis. According to contemporary medical research, the co-occurrence of phlegm accumulation and blood stasis is frequently observed in clinical settings. During epileptic seizures, the normal flow of qi and blood becomes disrupted, leading to qi stagnation and blood stasis. Consequently, the formation of "blood stasis" within the body may serve as a precipitating factor for seizures.

(3) Syndrome differentiation based on wind.

Wind, one of the six exogenous pathogens, can also lead to the occurrence of epilepsy. Wind is a Yang pathogen, and its inflammation occurs in the body. The site of epilepsy is in the head and brain, which are easily attacked by wind pathogens. In Taiping Shenghui Fang • Apoplexy, it is stated: "The invasion of the Yang meridian in the human body may lead to symptoms associated with madness, while the invasion of the Yin meridian can result in conditions related to epilepsy." The diseases caused by wind pathogens arise due to the loose and fragile texture of the skin, deficiency of Ying qi and defensive qi, impaired circulation of meridians, qi, and blood, as well as blockage of pores and orifices. This condition is referred to as an onset of epilepsy. Both emphasize that if bodily health is ignored, it becomes easy to be injured by wind pathogens and develop epilepsy. It is pointed out in Zheng Zhi Hui Bu that "The occurrence of epilepsy is due to obstruction from phlegm and water in the body, which causes fire to move wildly; this then leads to endogenous wind pathogens or results from weak qi where there’s insufficient qi and blood unable to control wind evil invasion." It clarifies that internal resistance from phlegm and fluid along with fire-induced production of wind are key pathogenesis factors for epilepsy while emphasizing wind's crucial role. Therefore, considering this basic pathogenesis caused by wind pathogens, primary treatment principles should focus on eliminating wind and stopping spasticity.

(4) Syndrome differentiation based on deficiency.

Many doctors believe that bodily deficiency and visceral weakness are the fundamental causes of epilepsy. Specifically, spleen and stomach weakness is considered the core pathogenesis of epilepsy, leading to seizures through the following mechanisms: First, qi and blood deficiency fails to nourish the brain, resulting in cerebral malnutrition. Simultaneously, this deficiency can leave the meridians vulnerable, allowing external pathogens such as wind to invade and generate internal wind. The interaction between internal and external pathogens disrupts mental clarity, thereby inducing epilepsy. Second, spleen and stomach weakness can obstruct the smooth flow of qi and blood, causing stasis. Third, as the spleen and stomach serve as a critical hub for transporting qi, blood, yin, and yang, their dysfunction leads to imbalances in ascending and descending movements; this results in turbidity obstructing clear yang from ascending to the brain, which contributes to epileptic episodes. Fourth, spleen and stomach weakness generates dampness that transforms into phlegm-dampness; this disturbs the mind and causes loss of spiritual control ultimately triggering epilepsy.

2.2. Mechanism of acupoint catgut embedding therapy in the treatment of epilepsy

2.2.1. Meridian theory

Acupoints function as key nodes along the meridians. Catgut embedding therapy entails implanting absorbable threads into specific acupoints, delivering sustained stimulation to the meridians. This approach not only enhances the flow of qi and blood but also promotes the harmonization of the body's internal environment by dredging the meridians. Based on traditional Chinese medicine (TCM) theory, epilepsy is frequently linked to deficiencies in qi and blood, accumulation of endogenous phlegm, and dysfunction of the zang-fu organs.

Acupoint catgut embedding entails selecting acupoints along meridians associated with brain function, including the governor vessel, conception vessel, Yangming foot-stomach meridian, and Taiyang foot-bladder meridian [11]. This technique enhances the coordination of qi and blood in the zang-fu organs,

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promotes the smooth circulation of qi and blood, ensures sufficient nutritional support for the brain, sustains optimal brain function, and thereby decreases the incidence of seizure triggers.

Through the stimulation of specific acupoints, phlegm and heat can be resolved, blood stasis can be alleviated, cerebral circulation can be enhanced, mental clarity can be improved, and epilepsy can be effectively prevented and treated. The human meridian system is an interconnected and mutually influential network. Following catgut embedding and the stimulation of specific acupoints, the function of related zang-fu organs can be modulated via meridian conduction, thereby restoring the balance of qi, blood, yin, and yang within these organs. This process helps to optimize the internal environment for patients with epilepsy and significantly reduces both the frequency and severity of seizures.

2.2.2. Neuro-endocrine-immune network

The pathogenesis of epilepsy has been reported to be associated with the imbalance of the neuro-immune-endocrine (NEI) network[12]. Acupoint catgut embedding may have the potential to regulate the NEI network through the following mechanisms:

Stimulation of acupoints can modulate the neuroendocrine system, particularly the hypothalamic-pituitary-adrenal (HPA) axis, through nerve reflex arcs. This modulation plays a critical role in regulating the levels of key hormones, such as cortisol and adrenocorticotropic hormone (ACTH), which are essential for the body's stress response and maintenance of homeostasis. Dysregulation of these hormones may potentially influence the onset or progression of epilepsy.

Regulation of the immune system: It plays a pivotal role in modulating immune function, thereby strengthening the body's resilience and reducing the adverse effects of immune factors on the nervous system. Specifically, it can regulate the activation of immune cells and the secretion of cytokines, including interleukins and tumor necrosis factors, thus maintaining immune homeostasis and preventing immune dysregulation that may contribute to or worsen epilepsy.

Regulation of neurotransmitter balance: reduction in excitatory neurotransmitters. Studies have demonstrated that acupoint catgut embedding significantly reduces the levels of excitatory amino acids, such as glutamate (Glu) and aspartic acid (Asp), in the cerebral cortex of epileptic rats [13]. For example, the study titled "The Effect of Acupoint Catgut Embedding on Amino Acid Neurotransmitters in the Cerebral Cortex of Experimental Epileptic Rats" reported that catgut embedding not only decreases the concentration of excitatory amino acids in the cortex but also mitigates neuronal hyperexcitability, thereby reducing the frequency and severity of epileptic seizures.

Regulation of inhibitory neurotransmitters and balance: Acupoint catgut embedding not only enhances the ratio of gamma-aminobutyric acid (GABA) to glutamate (Glu), but also restores the equilibrium between excitation and inhibition in the cerebral cortex. As evidenced by previous studies , acupoint catgut embedding significantly increases the GABA/Glu ratio in the cerebral cortex of epileptic rats, normalizing it and thereby exerting an anti-epileptic effect[13].

Anti-neuronal apoptosis: Epileptic seizures are known to induce hippocampal neuronal damage and impair cognitive function. Several studies [14] have shown that acupoint catgut embedding activates the PI3K-AKT signaling pathway in epileptic rats, a mechanism critical for cell survival, proliferation, and differentiation. By enhancing PI3K-AKT signaling, acupoint catgut embedding not only reduces hippocampal neuronal apoptosis but also alleviates neuronal injury, thereby improving cognitive function in epileptic rats. These findings suggest potential therapeutic implications for epilepsy treatment and prognosis.

2.2.3. Long-term Stimulatory Effects of Acupoint Catgut Embedding Therapy

Acupoint catgut embedding is a therapeutic technique that involves the insertion of absorbable gut threads into acupoints. Upon insertion, the gut thread undergoes a series of physiological processes, including softening, liquefaction, and absorption. Initially, as a foreign body, the gut thread induces mechanical stimulation to the acupoints. This stimulation causes minor tissue damage and triggers inflammatory responses, which in turn activate nerve endings at the acupoints and generate nerve impulses. As the gut thread progresses through liquefaction and absorption, its decomposition products provide sustained chemical stimulation to the acupoints, further enhancing and prolonging the overall stimulating effect. The combination of prolonged mechanical and chemical stimulation enables acupoint catgut embedding to maintain acupoint activation for an extended duration compared to conventional acupuncture. Consequently, this technique effectively regulates the flow of qi, blood, and meridians, as well as the functions of zang-fu organs in the human body.

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2.3. Explanation of the advantages of acupoint catgut embedding therapy for epilepsy

2.3.1. Advantages of long-term stimulation

Acupoint catgut embedding is a therapeutic technique that involves inserting absorbable catgut into acupoints. Within the body, the catgut undergoes a series of transformations, including softening, liquefaction, and eventual absorption, which collectively produce prolonged mechanical and chemical stimulation at the acupoints.

2.3.2. Overall regulatory advantages

According to traditional Chinese medicine (TCM) theory, the human body is viewed as an integrated organic whole, with the meridian system connecting the internal organs (zang-fu) to the body surface. Based on meridian theory, acupoints that are closely associated with the brain and related zang-fu organs and meridians are selected. By embedding catgut at these acupoints, the circulation of qi and blood can be regulated, thereby harmonizing qi and blood, providing sufficient nutrition to the brain, and maintaining its normal physiological function. From the perspective of modern medicine, acupoint catgut embedding can modulate the neuro-endocrine-immune network, improve the overall functional status of the body, and reduce seizure triggers.

2.3.3. Green and safety advantages

Most of the materials used in acupoint catgut embedding therapy are absorbable surgical sutures with excellent biocompatibility. Unlike antiepileptic drugs, which may cause long-term side effects such as liver and kidney damage, gastrointestinal discomfort, lethargy, and rashes, acupoint catgut embedding therapy generally does not produce significant systemic side effects. Temporary mild redness, swelling, and pain may occur at the embedding site but typically resolve spontaneously. Moreover, acupoint catgut embedding avoids the risks of trauma and postoperative infections associated with invasive surgical treatments. Therefore, acupoint catgut embedding ensures high safety while maintaining therapeutic efficacy, making it highly consistent with the principles of green treatment.

2.3.4. Advantages of economy and convenience

The long-term management of epilepsy entails significant costs. Surgical interventions are associated with high expenses, and the postoperative nursing and rehabilitation processes are complex and resource-intensive. Although the initial cost of antiepileptic drugs is relatively low, prolonged use can lead to substantial financial burdens over time. In contrast, the overall cost of acupoint catgut embedding therapy is comparatively low, and the procedure is simple. A single session of catgut embedding reduces the need for frequent medical visits, thereby alleviating both the time and economic burdens related to hospital travel for patients. This is especially beneficial for individuals in remote areas or those with limited financial resources, as acupoint catgut embedding provides an affordable and convenient therapeutic option. Furthermore, in some primary healthcare settings, physicians trained in this technique can perform acupoint catgut embedding therapy, offering hope for improved accessibility to treatment for more epilepsy patients.

Therefore, we present a case where a patient with epilepsy was effectively treated using acupoint catgut embedding therapy, leading to a substantial decrease in seizure frequency.

3. The Case

On December 12, 2022, a 15-year-old male patient was seen in our clinic. In December 2008, the patient's head and neck suddenly deviated to the left, his eyes stared to the left, his hands clenched, and he became unconscious. The seizures subsided after a few seconds, and they occurred more than 10 times a day. The patient was diagnosed with epilepsy and treated with sodium valproate oral solution. In December 2018, he had another seizure, manifested as facial flushing, screaming, involuntary movements of limbs, and loss of consciousness. It subsided in more than 10 seconds, and the seizure occurred 6-7 times a day. From February 2022 to the time of the visit, similar symptoms recurred, frequently occurring 8-10 times a day, each lasting tens of seconds. Oxcarbazepine tablets, levetiracetam tablets, sodium valproate sustained-release tablets, and other medications were being taken at the time of the visit.

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3.1. Acupoint catgut embedding therapy

Acupoint selection: Yintang (GV 29), Benshen (GV 20), Quchi (bilateral), Neiguan (PC 6), Jiuwei (GV 20), Zusanli (bilateral), Yanglingquan (bilateral), Sanyinjiao (bilateral), Dazhui (GV 14), Feishu (bilateral), Xinshu (bilateral), Ganshu (bilateral), Shenshu (bilateral).

In the catgut embedding procedure, the patient was placed in a supine position while the surgeon stood on the right side of the patient. The acupoints were palpated on the patient's body surface and marked with a marker pen. Following local disinfection of the acupoints and surrounding skin using iodophor swabs, the surgeon performed a seven-step hand disinfection protocol. Sterile gloves were then donned, and a piece of 4-0# collagen thread (1-2 cm in length, depending on the patient's body size) was grasped with sterile tweezers. Half of the thread was threaded into the front end of a disposable sterile injection needle, leaving part of it exposed outside the needle. The surgeon stabilized the acupoint with the thumb and index finger of the left hand and inserted the needle into the acupoint with the right hand to a depth of 0.8–1.0 inch. After slightly rotating the needle, it was withdrawn, leaving the thread embedded at the acupoint.

3.2. The basis of acupoint selection

In clinical treatment, the acupoints of the governor vessel are frequently selected for epilepsy management, and the spleen, heart, liver, kidney, and other meridians are also addressed through syndrome differentiation. The Yintang point is situated in the circulation region of the governor vessel, which connects to the brain via collaterals[15]. The stimulation of the governor vessel can awaken the mind, open the orifices, and calm the spirit. According to traditional Chinese medicine (TCM), seizures are associated with the concept of "loss of spirit," and the Yintang acupoint plays a role in regulating mental activity. Clinical observations have shown that thread embedding at the Yintang acupoint can inhibit epileptic discharge by regulating the levels of 5-HT and GABA. The "main decision" acupoint of the gallbladder meridian, Benshen, is adjacent to the brain and directly related to mental activity. The *Classic of Acupuncture and Moxibustion A and B* recorded that it was mainly used for epilepsy and vomiting. From the perspective of Western medicine, stimulating these two acupoints on the head may directly act on the cerebral cortex through nerve reflexes, regulate the neural electrical activity of the brain, affect the excitability of neurons, and thus inhibit the abnormal discharge of epileptic foci or improve the blood circulation of the brain, providing sufficient oxygen and nutrients for the brain and maintaining its normal physiological function. This reduces the likelihood of epileptic seizures. The Yangming meridian, being abundant in qi and blood, can clear liver and stomach heat excess, thereby alleviating the "phlegm-fire disturbing the mind" syndrome associated with epilepsy. Stimulation of the Quchi acupoint can modulate vagus nerve activity and suppress epileptic seizures. Neiguan (PC 6), as a confluent point of the Yin and Wei meridians, can calm the spirit, relieve chest tightness, regulate qi flow, and alleviate palpitations, which are common symptoms accompanying epilepsy.

Jiuwei, as the collateral point of the conception vessel, also serves as the origin of ointment. The conception vessel travels to the eye and connects with the brain, allowing the essence of Zang-fu to reach and nourish the brain through this pathway. The Jiuwei point exhibits therapeutic effects such as calming agitation, clearing phlegm, soothing the heart, regulating the mind, modulating the qi and blood of the conception vessel, eliminating phlegm, opening the orifices, nourishing the brain, and harmonizing the mind. These actions collectively contribute to its role in the treatment of epilepsy. Zusanli (ST 36), as the He-Sea point of the Stomach Meridian of Foot-Yangming, plays a crucial role in invigorating the spleen and stomach, tonifying qi, resolving phlegm, and dispelling dampness.The spleen and stomach are considered the foundation of acquired constitution and the source of qi and blood transformation. Spleen deficiency can lead to the accumulation of endogenous phlegm, which may predispose individuals to epilepsy.Stimulating Zusanli can enhance the function of the spleen and stomach, promote the generation of qi and blood, resolve phlegm and dampness, ensure sufficient qi and blood circulation while eliminating turbid phlegm, thereby reducing the pathological basis of seizures. Additionally, catgut embedding at Zusanli can modulate the gut microbiota-brain axis, inhibit the release of inflammatory factors, and alleviate the abnormal excitation of neurons.Yanglingquan (GB34) is the He-Sea point of the Foot-Shaoyang Gallbladder Meridian and the tendon convergence point among the Eight Converging (Influential) Points. It plays a crucial role in regulating Liver-Gallbladder Qi, subduing Liver Wind, alleviating muscle spasms, and effectively relieving convulsive symptoms during epileptic seizures. Sanyinjiao (SP6) is the convergence point of the Spleen Meridian of Foot-Taiyin, the Kidney Meridian of Foot-Shaoyin, and the Liver Meridian of Foot-Jueyin. As the liver, spleen, and kidney meridians intersect at this point, their functions are interrelated in regulation. Sanyinjiao can therefore be utilized

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to address the pathogenesis of epilepsy characterized by "liver-kidney yin deficiency, spleen deficiency, and phlegm accumulation." Back-Shu points (Feishu, Xinshu, Ganshu, and Shenshu) are utilized to balance Yin and Yang by modulating the functions of the internal organs. For instance, Ganshu can regulate liver function to suppress wind syndromes, while Shenshu nourishes the kidney essence to support water metabolism.From the perspective of Western medicine, stimulating Feishu may influence brain metabolism and function by enhancing respiratory system efficiency, thereby improving gas exchange and oxygen supply. The Shu points of Xinshu are intricately associated with cardiac function. Stimulating the Shu points of Xinshu can modulate the rhythm and contractile capacity of the heart, thereby ensuring adequate cerebral blood supply. Additionally, Ganshu and Shenshu may contribute to maintaining homeostasis within the internal environment by regulating hepatic and renal functions such as metabolism, detoxification, and excretion, thus providing a solid foundation for optimal brain function.

At the same time, Ganshu and Shenshu may influence brain nerve function and reduce seizure-inducing factors by modulating the neuroendocrine-immune network. Dazhui (GV 14), as the intersection of the governor vessel and the three Yang meridians of the hands and feet, plays a role in clearing heat and dispelling wind. The deep structure of Dazhui (GV 14) is rich in nerves and blood vessels. Stimulating Dazhui (GV 14) may modulate the neural function of the spinal cord and brain via reflex arcs, influence the release of neurotransmitters and nerve conduction pathways, and thereby regulate cerebral electrical activity. Furthermore, as a convergence point for Yang qi, stimulating Dazhui (GV 14) could potentially modulate the autonomic nervous system, enhance systemic blood circulation and metabolism, increase the body's stress resilience, and exert a certain inhibitory effect on epileptic seizures.

4. Clinical therapeutic effect

Patients were treated once a week for 8 weeks. After treatment, the number of seizures was significantly reduced, from 7 to 10 attacks per day to no attacks per day. At the same time, we recorded the comparison of EEG monitoring results before and after treatment (Table 1).

Table 1: Comparison of EEG monitoring results before and after treatment

	Eeg video	Eeg diagnosis
Before treatment 2022.03.02	During the video monitoring, 9 clinical attacks occurred at 12:32, 14:46, 17:13, 19:22, 04:57, etc., in the awake or sleeping phases, while sitting or lying down. At 19:22, during the awake phase and while sitting, the patient exhibited symptoms including screaming, involuntary movement of the left-hand fingers, raising of the right hand to touch the head, body sliding, pulling of the quilt with hands, pedaling of lower limbs, turning, whole-body shaking, and unconsciousness. The episode lasted about 18 seconds before relief. Synchronous EEG showed the onset of spike waves from the right forehead and anterior temporal leads, followed by continuous discharge of spike wave rhythms, sharp wave rhythms, and irregular slow waves for approximately 20 seconds before returning to background rhythm (during which interference artifacts were caused by extensive movements).	Abnormal electroencephalogram. Onset: the right forehead, anterior temporal sharp wave onset, each followed by spike rhythm, sharp wave rhythm, and irregular slow waves that continued for about 20 seconds before restoring the background rhythm. Intermittent phase: slightly more low- to high-amplitude single spikes, continuous sharp waves, spikes, sharp-slow waves, and combined spikes and slow waves were observed in the bilateral forehead, frontal, anterior temporal, right middle temporal, and midline frontal channels during waking and sleeping periods.

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After treatment 2023.02.28	During the continuous video monitoring, no clinical seizure events were observed.	Abnormal adolescent electroencephalogram. Background activity: The occipital lead alpha rhythm during wakefulness was slower compared to age-matched peers. Intermittent period: Moderate to very high amplitude sharp waves, sharp slow waves, and sharp-slow complex waves were observed as isolated, continuous, or paroxysmal discharges, predominantly in the right frontal, midline frontal, and frontal leads.

Follow-up results: The patient underwent acupoint catgut embedding treatment once a month from 2023 to 2024, experienced no further seizures, and took no antiepileptic medications during this period.

5. Discussion

In this case, we observed that electroacupuncture combined with acupoint catgut embedding could effectively control seizure frequency and significantly enhance the quality of life for patients with epilepsy. The underlying mechanism of epilepsy is highly complex and remains incompletely understood. Currently, the widely accepted mechanism involves an imbalance between excitation and inhibition within the central nervous system, which is closely associated with ion channel dysfunction, neurotransmitter imbalances, genetic factors, and immune abnormalities. Electroacupuncture and acupoint catgut embedding have demonstrated remarkable therapeutic effects in managing epilepsy by improving the structure of the brain's nervous system, alleviating clinical symptoms, and reducing seizure frequency.

6. Summary, analysis and prospect

Our observations indicate that electroacupuncture combined with acupoint catgut embedding might be effective for treating epilepsy, controlling disease recurrence, and could serve as an alternative therapy. However, given that this is a single case, no definitive conclusions can be drawn. Further studies with sufficiently large sample sizes are required to validate the efficacy of acupoint catgut embedding and elucidate its potential mechanisms of action.

In addition, acupoint catgut embedding exhibits a restricted scope of application in epilepsy treatment. It demonstrates efficacy in managing idiopathic epilepsy or symptomatic epilepsy (e.g., post-encephalitis epilepsy), yet its effectiveness is limited for epilepsy induced by structural pathologies (e.g., brain tumors or cerebrovascular diseases). Due to individual variability, some patients may experience negligible therapeutic effects, necessitating the integration of additional treatment modalities. Notably, the current evidence base is suboptimal, as most existing studies are characterized by small sample sizes, single-center designs, and potential publication bias. There is a scarcity of high-quality randomized controlled trials (RCTs) and a lack of long-term follow-up data regarding the long-term efficacy and safety, which limits the generalizability of the conclusions. Moreover, acupoint catgut embedding therapy has not yet become a replacement for mainstream treatments. The management of epilepsy remains primarily reliant on antiepileptic drugs and surgery, with catgut embedding therapy serving mostly as an auxiliary approach. For refractory epilepsy, it should be cautiously applied only after standardized medication regimens have been established, and catgut embedding therapy should not be solely depended upon.

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