

**SOUTH BAYLO UNIVERSITY**

**ACUPUNCTURE FOR FEMORAL NERVE INJURY AFTER GYNECOLOGIC  
SURGERY – A CASE STUDY**

**by**

**VICTORIA S CLAMOR**

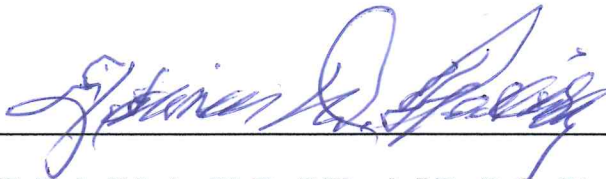
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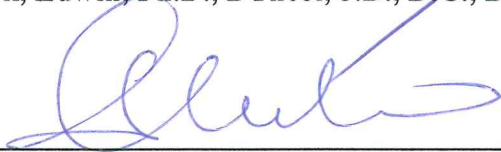
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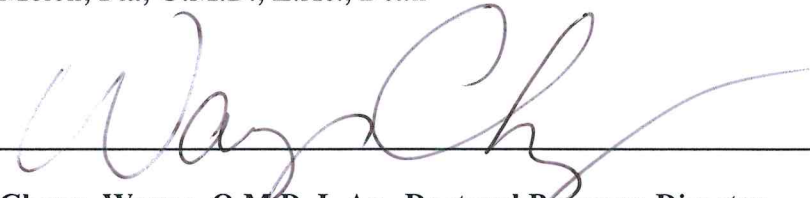
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**ABSTRACT**

This report describes the use of acupuncture treatments for a patient with prolonged pain, numbness, weakness and stiffness on her right leg. The condition started after undergoing gynecological surgery. The patient is suffering from stage 3 ovarian cancer. The patient received twice a week acupuncture treatments since March 2015. In the course of 5 months, the patient was able to regain her leg strength. She no longer experienced buckling while walking, was able to walk without the aid of a walker, could drive 48 miles, and was finally able to engage in relatively low impact exercises. Her overall well-being has improved but the right thigh muscles are relatively still weaker compared to the normal left leg. Although acupuncture appeared to have a promising therapeutic effect on femoral nerve injury after gynecological surgery in this particular patient, randomized control trials should be done using acupuncture treatment to provide more evidence for a more quantitative and qualitative analysis.

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## I. INTRODUCTION

Abdominopelvic operation is the most frequent cause of iatrogenic femoral nerve injury, particularly when self-retaining retractors are used (Maneschi, 2014). Transverse abdominal incisions and thin body habitus are significant risk factors. Patients typically have mild sensory and/or motor disturbances with diminished knee jerk reflexes. Most femoral nerve injuries that are associated with abdomino pelvic surgery can be prevented with a thorough understanding of the pelvic anatomy and proper placement of self-retaining retractors (Chan JK, 2002). It has been documented in the obstetrics/gynecology and urologic literature that injury after these procedures may be related to direct compression of the femoral nerve during surgical procedure, patients wrong positioning and most often direct compression of the nerve with the placement of self-retaining retractors (Cardosi RJ,2002).

A retractor is a medical tool that surgeons use to separate or hold back the ends of a surgical incision, mostly the abdomen and chest as the most common sites. This is done so that surgeons can gain much better access to the area that they intend to operate on. Retractors are generally manufactured as hand-held steel tools, with one end serving as the spreader and the other end being the handle. The Bookwalter Retractor is made of steel and designed as a curved blade (Moore, 2011).



Fig. 1. Bookwalter Retractor

Source: [www.teleflexurgicalcatalog.com](http://www.teleflexurgicalcatalog.com)



Fig. 2. Omni Retractor with two adjustable arms rather than a ring attached to a post.

Source: [sites.google.com](http://sites.google.com)



Femoral nerve injury during gynecologic cancer surgery, in this case, was associated with the Bookwalter retractor. Electromyography and nerve conduction tests revealed weakness of hip and thigh flexion, knee extension, and one side lower extremity impairment.

Acupuncture has been use in China for over 3,000 years. Acupuncture involves the gentle insertion and stimulation of thin, disposable sterile needles at strategic points near the surface of the body. Acupuncture has been used to reduce pain and improve function and movement among patients with acute and chronic pain and disabilities.

### **Clinical Manifestations of Femoral nerve injury**

The clinical symptoms of femoral nerve injury are loss of sensation or numbness of the anteromedial aspect of the thigh including dull aching pain and hyperesthesia because of the damaged nerves. There is weakness of ipsilateral hip flexion and knee extension. The leg feels weak, there is numbness and tingling sensation, and/or the patient feels like the leg is going to give up (knee buckling).

The femoral nerve is one of the largest nerves in the leg. It is located near the groin and controls the muscles that help straighten the legs and move the hips. It also provides feeling in the lower part of the leg and the front of the thigh. When this nerve is damaged, it affects the ability to walk and may cause problems with sensation in leg and foot (Health Grand Rapids, 2010).

## **What is the diagnosis and treatment for femoral nerve injury?**

MRI scan is the most frequently used procedure to find lesions and tumors in the femoral nerve. Femoral nerve damage is also diagnosed by using nerve conduction test and electromyography. Nerve conduction checks the speed of electrical impulses in nerves. An abnormal response, such as a slow time for electrical signals to travel through the nerves, usually indicates damage to the nerve in question. Electromyography (EMG) should be performed after the nerve conduction test to see how well the muscles and nerves are functioning and responding to stimulation. A needle electrode that is attached by wires to a recording machine is inserted into a muscle. When the electrodes are in place, the electrical activity in that muscle is recorded while the muscle is at rest. The doctor will ask the patient to tighten (contract) the muscle slowly and steadily. This electrical activity is recorded. Electrical activity in a muscle at rest shows that there may be a problem with the nerve supply to the muscle. Abnormal wave lines when a muscle contracts may mean a muscle or nerve problem (Maneschi F, 2014).

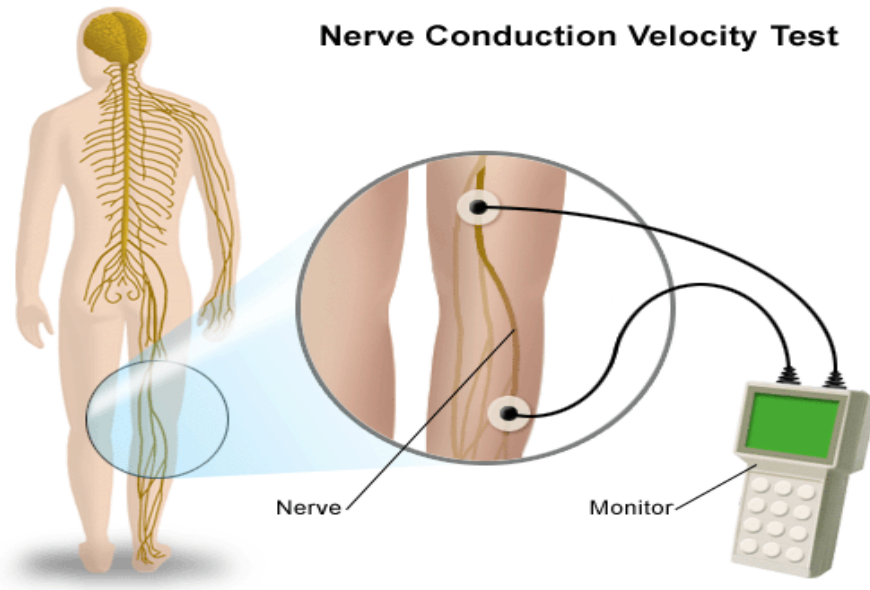


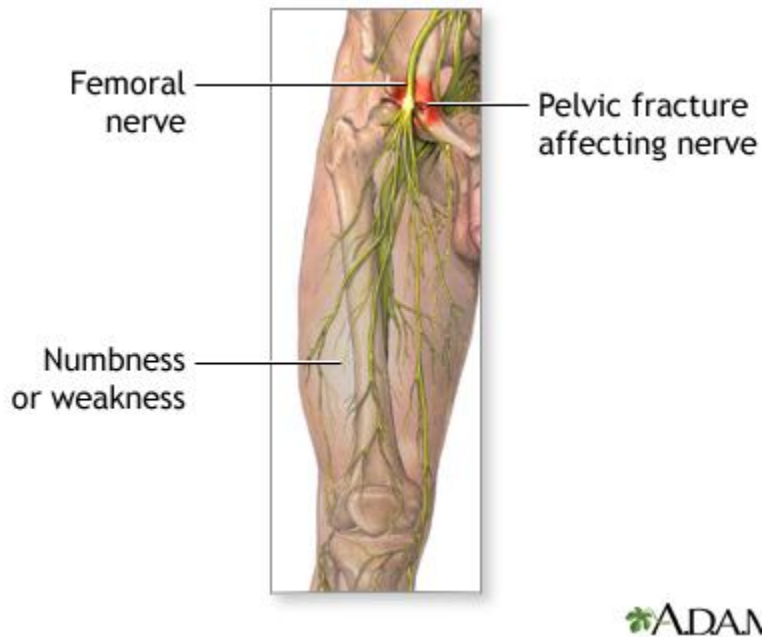
Fig.3 Femoral Nerve Conduction Test

Source: hopkinsmedicine.org

Nerve	Site	Latency (ms)	Amplitude (mV)	Velocity (m/s)
Rt common peroneal	Ankle	3.30	0.6	
	Fibular head	9.25	0.6	52.1
Lt common peroneal	Ankle	3.85	0.7	
	Fibular head	9.80	0.8	51.3
Rt tibial	Ankle	2.85	13.5	
	Knee	9.75	8.9	52.2
Lt tibial	Ankle	2.75	12.7	
	Knee	10.15	8.7	49.3
Rt femoral	Inguinal canal	5.10	6.5	
Lt femoral	Inguinal canal	5.15	9.1	

Fig. 4- Example of normal motor nerve conduction test results for femoral neuropathy after vaginal delivery. The latencies and amplitudes are in normal range.

Source: www.ekja.org



ADAM.

Fig. 5. Pelvic Fracture Affecting Femoral Nerve

Source: scripps.org (Scripps Health Nerve Conduction Velocity)

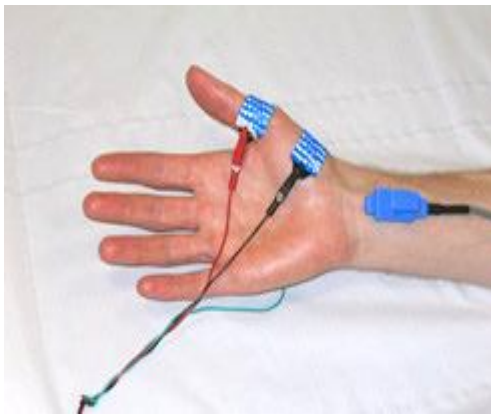


Fig. 6. NERVE CONDUCTION TEST FOR MEDIAN NERVE

Source: Median-Nerve.com

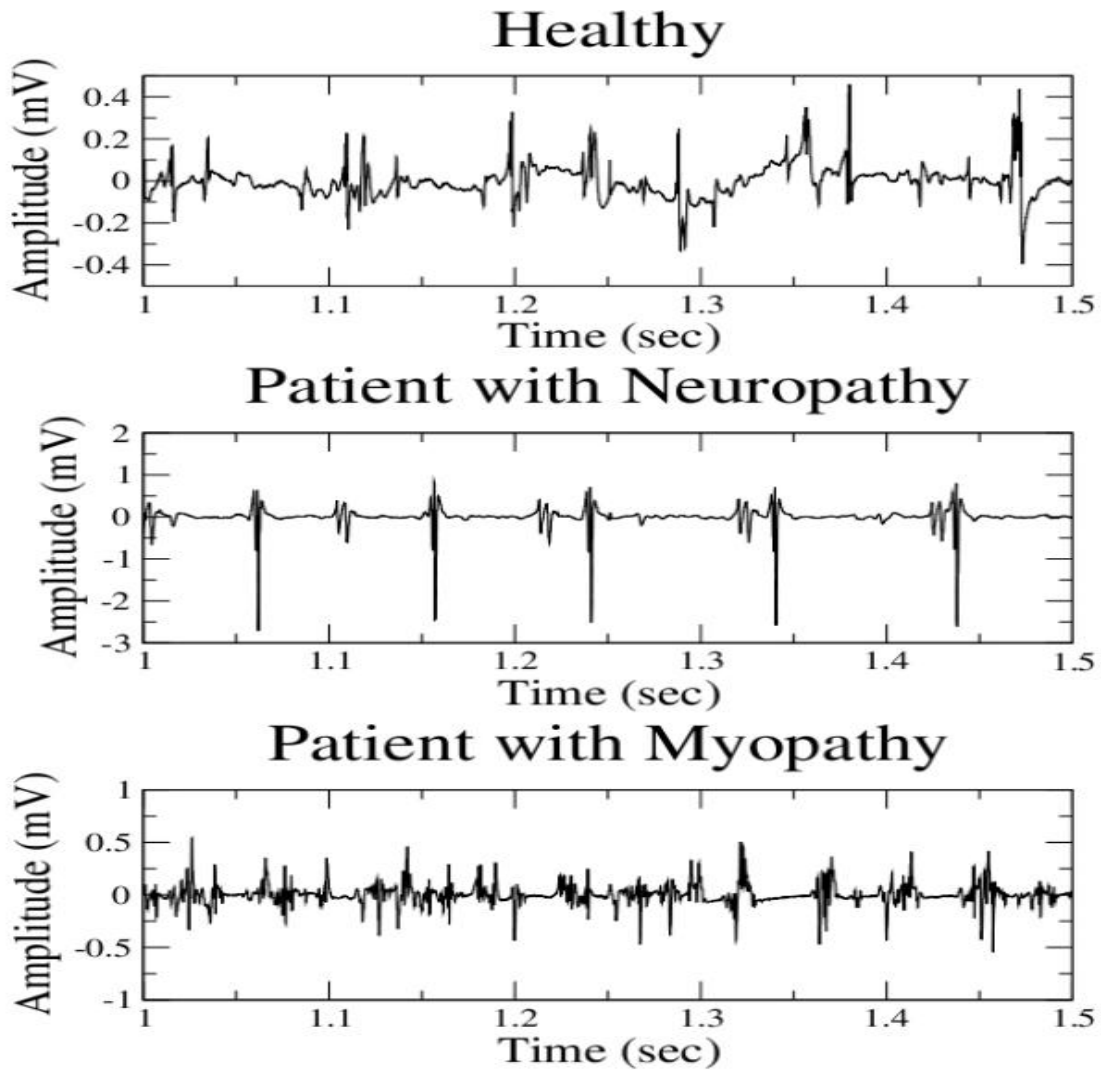


Fig. 7. EXAMPLE OF HEALTHY, NEUROGENIC AND MYOPATHIC EMG SIGNALS

Source: [www.intechopen.com](http://www.intechopen.com)

Additional tests can be done like blood test, CT scan to determine if there are any vascular bone growth. In extreme conditions, patients with the condition request additional assistance to increase their mobility. Corticosteroid injections are prescribed in treating inflammation and swelling, together with pain killers. Physio therapy and other alternative therapy such as acupuncture and massage can be done to help with the condition.

Significance:

“Acupuncture has been use to treat various pain conditions in many clinical trials and clinical settings. However, using acupuncture to treat post surgical femoral nerve injury is rarely reported”.

The PURPOSE of this study was to describe a case receiving acupuncture therapy for femoral nerve injury after gynecological surgery.

## II. MATERIALS & METHODS

**Case Description:** A 51 year old female patient was referred to the clinic, for femoral nerve lesion two months after she underwent a gynecological surgical operation for her ovarian cancer. The operations lasted for five hours. She was placed in a lithotomy position with her legs resting on a knee supports. She had no smoking history, no hypertension and no diabetes mellitus. After the surgery, the patient felt pain and numbness on her right thigh, and reduced sensation on her right knee down to her leg. The patient experienced knee buckling from time to time, muscle weakness and stiffness, and difficulty walking. She fell down several times due to loss of body balance. Nerve conduction velocity test (NCV) of medial femoral cutaneous nerve showed reduction of sensory action potential on the right side. The patient received physiotherapy including muscle strengthening exercise and ambulation training. Two months after the surgery, neurological examinations showed decrease pinprick sensation on the right medial thigh and the patient has mild paresthesia on the right thigh.

**Physical Examination and investigation :** Upon examination of the thigh, muscle weakness was evident, there was difficulty in raising and straightening the right leg with mild tenderness on palpation, especially on muscles near the groin, buttocks and front of her thigh. Knee buckling was also evident when doing extension and hyperextension. Manual muscle testing revealed decreased muscle strength to 3+/5 on right hip flexors and 4+/5 on knee extension. There was mild response to stimulation on the right medial femoral cutaneous nerve. DTR (Deep tendon reflex) was tested if there is Hoover sign. The sign relies on the principle of synergistic contraction. This is done by placing one hand behind the heel of the patient's weak leg and asks her to push against it. Then the patient is asked to raise the other leg, with flexion at the contra-

lateral hip, the normal leg has more pressure than the weak leg and the patient involuntarily extends the weak hip.

**Methods/PROTOCOLS:** The patient was given an orientation and the protocols of the acupuncture treatment. The patient was advised to come to the clinic for twice a week acupuncture sessions for three months and then once a week thereafter. The treatment started in March 3, 2015 to August 1, 2015, with 15 minutes acupuncture on the back and 20 minutes on the front with electric stimulation, followed by tuina massage for another 10 minutes. The author used reference guidelines under [www.meridiansjaom.com](http://www.meridiansjaom.com).

The LEFS (lower extremity functional scale) was done to assess general outcome measures. This is performed by asking the patient to rate the difficulty of performing tasks on a 0-4 point scale. A score of 4 equates to “No Difficulty” while a score of 0 means “Extreme Difficulty or unable to perform”. The patient was also asked to walk to measure foot drop. Foot drop is an abnormal walk (gait), which is caused by a tendency of the front half of the foot to drop downwards as the person walks. The affected foot can catch on the floor as she swings her leg forward to take a step and the affected leg swings out to the side to avoid it catching on the floor. We measure foot drop on a scale of 3, where grade of 0 is the weakest and 5 the strongest. According to Physiopedia, (June 2014), the most simple VAS is a straight horizontal line of fixed length, usually 100 mm. The ends are defined as the extreme limits of the parameter to be measured. In some studies horizontal scales are orientated from right to left and many investigators use vertical VAS.



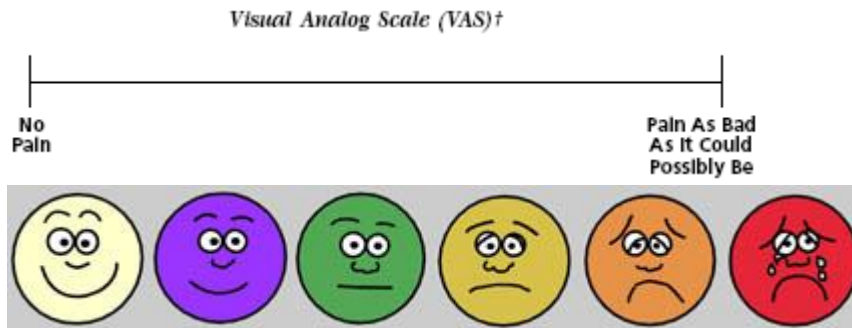


Fig. 8 -Visual Analog Scale after surgical operation where pain intensity is 0-10

Source: [www.physio-pedia.com](http://www.physio-pedia.com)

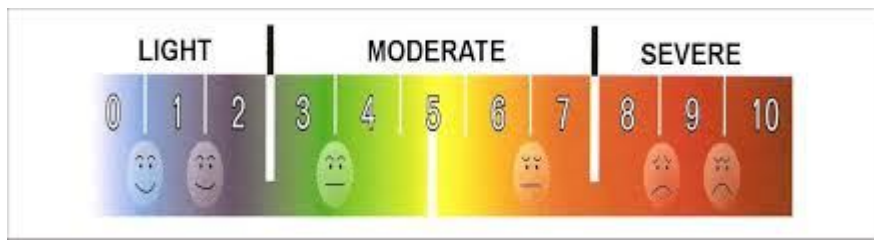


Fig. 9- Visual Analog Scale: Source: [www.scielo.br](http://www.scielo.br)

After three months of treatment, the patient was asked to fill in a form similar to SF-36 to determine health-related quality of life (HRQoL), and focus more on: quality of sleep, exercise, socializing, emotions, stress level, family life, developing hobbies, performing household chores, shopping, physical activity such as going upstairs, use of aid/walker, ability to self-clean/dressing etc. Rating the difficulty of performing task on a 0-10 point scale, where 10 is rated as the highest with no difficulty.

### Needling Details

During the course of treatment, acupuncture point on the back using UB25, UB28, GB30, using GB31, UB32, UB36, UB40, UB57, UB60. Front point consists of: St31, St.32, Sp10, xiyan, St36, St41, GB40. Needles were inserted 0.5 – 1.5 cun perpendicularly and oblique depending on the location. Tonifying technique and reducing manipulation were given on certain points with muscle weakness and severe pain. Back and front points were given with dense-dispersed wave electro acupuncture.

The author adopted STRICTA recommendations the acupuncture rationale that include a statement about the style of acupuncture being used, together with an explicit explanations for the chosen treatment, including diagnosis, point selection and treatment procedures.

Needling Details: Points selection on UB25, UB28, UB36 tonifying manipulation to relieve her lower back stiffness, muscular atrophy and motor impairment of the lower extremities and also to strengthen her lumbar vertebra. UB40 was used for lower back pain, impairment of the hip point, constriction of tendon in the popliteal fossa, motor impairment of the lower extremities and muscular atrophy.

St.36 for lower leg function and for strengthening her immune system. St.40 and UB60 is for her pain in ankle and lower extremities. Other local points such as Sp10, St.31, xiyan, are used not only for pain but to improve the range of motions on her knee, thigh and legs. Stainless steel needles were used, gauge 36.

### **Acupuncturist's Credentials and Background:**

The acupuncturist who administered the acupuncture treatment has at least 23 years of experience in China and the Philippines and 4 years in the United States. She has edited two acupuncture books and was a part-time lecturer at the University of the Philippines, University of the East and the Department of Health in Manila, Philippines. She was the Associate Director of the Philippine-China Development Resource Center and the founding Director of the Philippine Center for Traditional and Asian Medicine (PCTAM).

### **III. RESULTS**

After the first three months of treatment, the numbness and pain in the right thigh of the patient was reduced from 8/10 to 3/10. The patient was encouraged to do minor exercises such as walking and swimming. She was able to raise her leg and can walk without the aid of a walker. Muscle stiffness is still present after long walk exercise or when the patient climbs the stairs. She drives short distances (35 miles) and became more independent at home.

After the 5<sup>th</sup> month, the patient's pain level was reduced to 2/10 and there were times that pain and muscle stiffness were completely absent. The patient can walk straight without limping. EMG test results gave mild radiculopathy without range of motion limitation. Also on the 5<sup>th</sup> month of therapy, her doctor informed her, that her cancer has relapsed and she needs to undergo series of chemotherapy again. The patient continues to come for acupuncture treatment in the clinic up to this date.

## IV. DISCUSSION

Femoral nerve lesion includes a thorough and comprehensive assessment and review by a medical practitioner. This injury is attributed to the use of self-retaining retractor directly compressing the nerve in the region of the psoas muscle near the inguinal ligament that results in compression injury of the nerve. Comorbid conditions and smoking of the patients may predispose patients to nerve injuries. Also, patients with previous peripheral neuropathies, diabetes or alcohol abuse can aggravate postoperative neuropathy. Acupuncture may be considered as an option to relieve the symptoms caused by femoral nerve injury. Acupuncture is a safe and less invasive therapy and may be helpful in reducing pain, spasm and rigidity of the affected nerves and muscles.

Acupuncture seem to help in improving range of motion in this particular patient with hip flexion of 120 degrees and knee flexion of 135, using the American Academy of Orthopedic Surgeons standard range of motions for lower extremities. Muscle strength varies from day to day with a scale of 4+/5 to 4.5+/5.

Although there were quite a few literature of femoral nerve injury after gynecologic surgery, most of the topic pertains to the general discussions on the effect of using retractors. The author found no particular literature on using acupuncture for femoral nerve injury.

Guang-he-he (2015, Jan.10) compared the efficacy of using GV/LM (governor vessel and local meridian points) in the treatments of patients with peripheral nerve injury by using *Baihui* (GV20), *Fengfu* (GV16), *Dazhui* (GV14), and *Shenzhu* (GV12), selected to treat nerve injury of the upper limb and *Jizhong* (GV6), *Jingmen* (GV4), *Yaoyangguan* (GV3), and *Yaoshu*(GV2) to treat nerve injury of the lower limb. In the LM group, only meridian acupuncture points along the injured nerve were selected. Both groups had electro acupuncture

treatment for 30 minutes, once a day, 5 times per week, for 6 weeks. Two cases dropped out of the LM group.

A good or excellent clinical response was obtained in 80% of the patients in the GV/LM group and 38.5% of the LM group. Electromyographic nerve conduction tests were performed before and after acupuncture to explore the mechanism of action of the treatment. An effective response was observed in 80.0% of the patients, with greater motor nerve conduction velocity and amplitude after treatment, indicating that electro acupuncture on specific Governor vessel acupuncture points promotes functional motor nerve repair after peripheral nerve injury. In addition, electromyography was performed before, during and after electro acupuncture in one patient with radial nerve injury. After a single session, the patient's motor nerve conduction velocity increased by 23.2%, indicating that electro acupuncture at Governor vessel acupuncture points has an immediate therapeutic effect on peripheral nerve injury (Guang-he-he, 2015).

Li SC, et al (2013, Nov.) observed the difference in the efficacy of the treatment of traumatic nerve injury using electro acupuncture, warm needling therapy and both electro acupuncture and warm needling. 93 cases using a single blind randomization principle. They divided the group into two, one using warm needling only and the second group using electro acupuncture and warm needling, 31 cases in each group. The main acupuncture points were selected from Yangming (ST) Meridian and Shaoyang (GB/SJ) Meridian corresponding to the distribution of damaged nerves.

The treatment was given once every day, 15 treatments made one session. After 3 sessions of treatment (45 treatments in total), EMG and ENG were re-checked and the results were analyzed statistically. Results showed an effective rate of 96. 8% in the EA plus WN group, while 77. 4%

in the WN group alone. It concluded that combining EA and WN is a better therapy of acupuncture and moxibustion in the treatment of traumatic nerve injury.

Hao J, et al (1995, June 15) did a study on the use of electric acupuncture in the treatment of peripheral nerve injury. 54 cases of peripheral nerve injury were treated by electric acupuncture and compared with 54 control cases treated with supportive medication. The changes after treatment were observed chiefly by electromyography while sensory and motor improvement were also recorded as auxiliary indicators. The therapeutic results in the acupuncture group were 5 cases cured, 26 markedly effective, 19 improved, and 4 cases failed, a total effective rate of 92.6% in contrast to the 55.6% for the controls.

Analysis of the therapeutic results showed that, first, those in the acupuncture group were significantly better than in the control group; second, nerve injuries should be treated as early as possible; third, the radial nerve and the common peroneal nerve recovered faster than others; fourth, cases not surgically explored recovered faster than those that were, and fifth, patients with prompt propagation of the needling sensation recovered significantly faster than those with slow propagation (Hao J, et. al, 1995)

The two literatures described the use of electro acupuncture in the treatment of nerve injury, not particularly the femoral nerve injury. The case that I am presenting showed promising results. However, the efficacy of acupuncture in the treatment of femoral nerve lesion after gynecological surgery needs further studies and more cases to reaffirm and consolidate the validity and importance of the treatment.

## **V. CONCLUSION**

In conclusion, results from this case study have provided basic information about the treatment efficacy of using acupuncture for femoral nerve injury. This case study showed promising results and options for clinicians to use acupuncture as adjuvant therapy in treating postoperative pain.

Further studies with a much larger number of subjects and rigorous study design are needed to confirm and properly evaluate the effectiveness and potential use of acupuncture in the treatment of acupuncture for femoral nerve injury after gynecological surgery.



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