American College of Traditional Chinese Medicine @CIIS, DAOM Program

Samantha Hodges

Date: 12/19/2019

Case study: Externship

Fu's Subcutaneous Needling (FSN) Immediately Eliminates Chronic Pain Associated with Hip Arthritis: A Case Study

FU'S SUBCUTANEOUS NEEDLING (FSN) IMMEDIATELY ELIMINATES CHRONIC PAIN ASSOCIATED WITH HIP ARTHRITIS: A CASE STUDY

Abstract

Background: 83-year-old female with chronic hip pain due to arthritis.

Objective: This case study describes Fu's Subcutaneous Needling (FSN) method and how it improved pain and mobility in a patient with chronic hip pain due to arthritis.

Design, Setting, Patient: Patient was seen in an acupuncture office by an acupuncturist with over 25 years' experience.

Intervention: Fu's Subcutaneous Needling (FSN) was used to reduce the patient's pain.

Results: Patient's pain was significantly reduced in one treatment. She was able to walk without a cane in two treatments. The patient reduced the amount of pain medication she was taking and reported better quality of sleep.

Conclusion: FSN needling may be effective in the treatment of chronic hip pain associated with arthritis.

Keywords: acupuncture, hip pain, Fu's needling, FSN needling, Fu's acupuncture, Floating needling, floating acupuncture, myofascial pain, orthopedic acupuncture, pain, arthritis

FU'S SUBCUTANEOUS NEEDLING (FSN) IMMEDIATELY ELIMINATES CHRONIC PAIN ASSOCIATED WITH HIP ARTHRITIS: A CASE STUDY

Introduction

In an effort to better understand the frequency and intensity of pain experienced by U.S. Adults, the National Health Interview Survey (NHIS) was distributed to U.S. adult citizens (Nahin, 2015). Data included that of 8,781 adults who completed the Functioning and Disability Supplement of the 2012 NHIS, which asked participants about the frequency and intensity of pain experienced in the previous three months. Using this data, it is estimated that 126.1 million adults had pain, with 25.3 million adults (11.2%) suffering from daily (chronic) pain (Nahin, 2015).

Patients in pain are commonly prescribed pain medication, one of which are opioids. The U.S. Centers for Disease Control and Prevention reported that between 2006 and 2015, the amount of opioids prescribed in the United States reached a peak in 2010 then decreased steadily through 2015 (Schuchat, Houry, & Guy, 2017). Researchers reported prescribing rates of opioids increased between 2006 and 2010, flatlined 2010 and 2012, then began to dive from 2012 to 2015. However, opioids prescribed in 2015 remains more than three times higher than in 1999 and is quadruple that in Europe as of 2015 (Schuchat et al., 2017).

Given this data, there is a great need for noninvasive effective relief from chronic pain. One promising form of treatment for chronic pain is Fu's subcutaneous needling (FSN). This case study will explain FSN and give a report of a patient with chronic pain due to hip arthritis that had significant improvement immediately following a treatment with FSN.

Fu's Subcutaneous Needling (FSN)

Fu's subcutaneous needling (FSN), is a derivative of traditional Chinese acupuncture. This technique is most commonly used for musculoskeletal pain, however, has been noted to be effective for headaches and other localized diseases (Fu & Shepherd, 2013). The first published

article on the effectiveness of FSN was in the 1998 article "Introduction to Floating Acupuncture: Clinical Study on the Treatment of Lateral Epicondylitis" in the *American Journal of Acupuncture* (Huang, Fu, Xia, & Wu, 1998). FSN is performed using either a trocar needle or a wide gauge needle (24G is common) and is inserted superficially, directed at the area of injury, commonly a trigger point (TrP), but never directly on the site (Fu & Shepherd, 2013).

The meaning of FSN, pronounced "*Fu Zhen"* in Chinese, can be defined in two ways: one is from the surname of the inventor and secondly *Fu* is translated as floating or superficial and *Zhen* is translated as acupuncture or needling (Fu & Shepherd, 2013). However, Dr. Fu choose to not accept these translations as they did not accurately describe the technique. He determined the translation *subcutaneous* best described how the needle was to be employed (Fu & Shepherd, 2013).

How FSN is Different from Traditional Acupuncture (TA)

There are several significant differentiations that separates FSN from traditional acupuncture (TA). Location of FSN insertion does not follow the same meridian concepts of TCM and *deqi* is not to be obtained (Fu & Shepherd, 2013). Although the development of FSN was inspired from wrist ankle acupuncture (WAA), it is not the equivalent. Dr. Fu started the initial clinical trials based on the hypothesis that the same or similar technique used in WAA would be more effective closer to the site of injury (Fu & Shepherd, 2013).

The technique used to administer FSN does coincide with the technique called *Zhizen Ci* (Fu & Shepherd, 2013). In this technique, the practitioner is to hold up the skin with the thumb and index finger of left hand; insert the filiform needle into the skin; and then go forward towards the painful spot. The difference between the two techniques is the swaying movement

done in FSN. The authors consider FSN to be a form of modern acupuncture, traditional theories are replaced with emphasis on neurophysiology and anatomy (Fu & Shepherd, 2013).

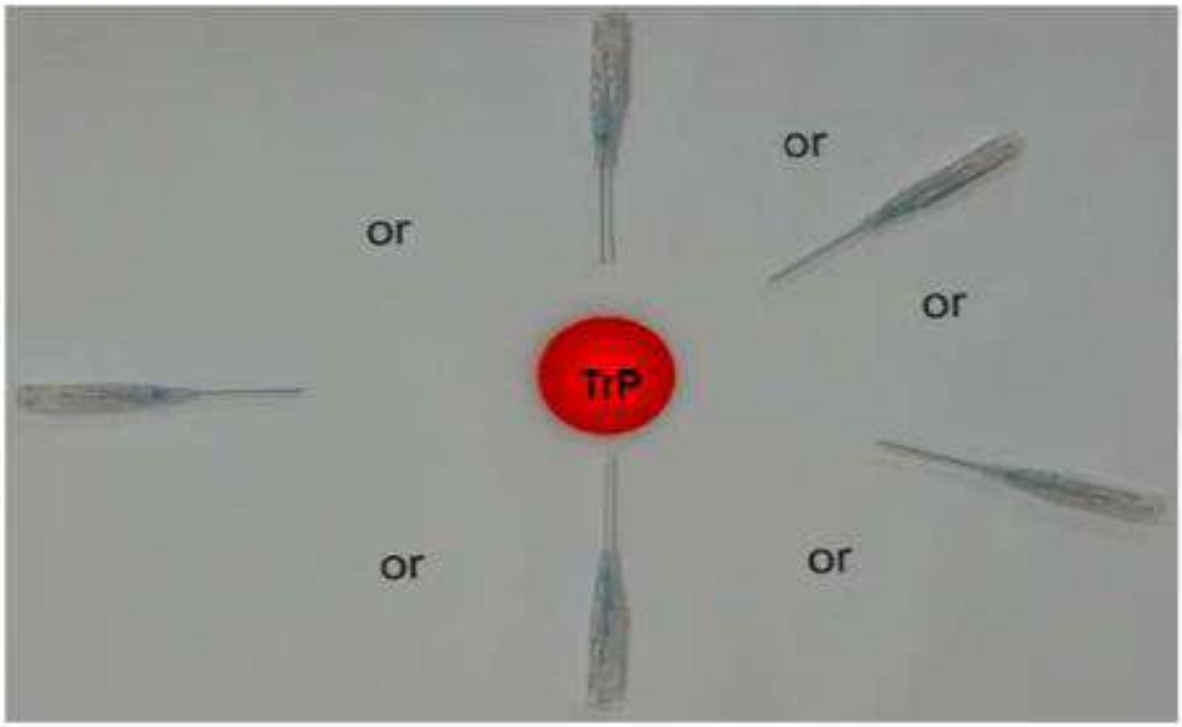

Figure 1. Positioning of FSN needles in relation to a TrP. From, "Fu's Subcutaneous Needling, a Modern Style of Ancient Acupuncture?" by Z. Fu and R. Shepherd, 2013, in *Acupuncture in Modern Medicine.* p.179. Copyright 2013 by InTech.

FSN Compared to Dry Needling (DN)

Despite similar emphasis on neurophysiology and anatomy, FSN is not to be confused with DN. The main differences being that FSN needles are inserted away from the myofascial trigger points (MTrPs) and there is only a subcutaneous insertion (Fu & Shepherd, 2013). The identification of MTrPs is done by palpating for a taut band in the muscle that is tender and accompanied by a specific pattern of referred pain (Simons, Travell, & Simons, 1999).

End plate noise (EPN) is highly correlated with the irritability of a MTrP (Kuan et al., 2007). The amplitude changes in EPN recorded in the MTrP region can be translated into the

level of irritability within the MTrP (Ge, Fernández-de-las-Peñas, & Yue, 2011; Kuan et al., 2007). In a study to compare location of administration of FSN and the correlation with reduction in EPN, the following variables were observed: FSN done proximally, distally, contralateral, and ipsilateral (Fu et al., 2012). The results showed that the most significant reduction in EPN resulted from proximal ipsilateral FSN (Fu et al., 2012). It is worth noting that dry needling has been also shown to have a significant reduction in EPN (Ge et al., 2011). FSN can be considered a less invasive and painful way to treat MTrP.

FSN: Needle Description

In order to accomplish the swaying needling technique, a strong needle is necessary. Dr. Fu attempted to create such a needle several times until finally inventing the trocar needle (Fu et al., 2012). The trocar needle is modeled from the i.v. catheter needle, only in a solid form. The needle is constructed into two parts: the solid stainless-steel filiform needle and a soft casting pipe. The needle is sharp enough to penetrate the skin easily and with minimal pain .The gauge of the needle is large enough so that the needle will not bend or break during the technique. The casting pipe is soft and nonirritating to the patient (Fu et al., 2012).

It is to be noted that a filiform 24 G needle may be used. In this case study, the Xue Clinic commonly used a 24 G Silver Star needle to administer the technique. The needle is retained in the patient only while the patient is in office.

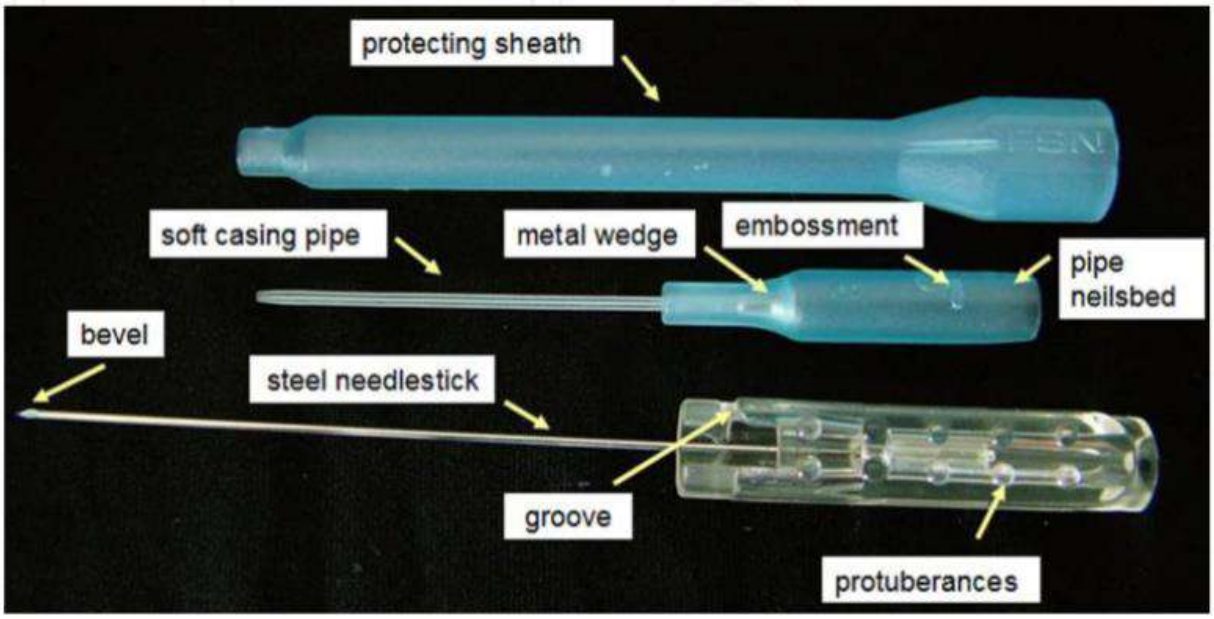

Figure 2. Parts of the FSN needle. From "Fu's Subcutaneous Needling, a Modern Style of Ancient Acupuncture?" by Z. Fu and R. Shepherd, 2013, in *Acupuncture in Modern Medicine,* p. 189. Copyright 2013 by InTech.

FSN: Needling Technique

Having the patient in the proper posture is the critical first step in administering FSN. In this case study of hip arthritis of the right hip, the patient was put in the lateral recumbent position with a pillow under her head, another pillow to support her right arm, and a third pillow placed between her legs. Once the patient is comfortable and the injured site is exposed, the practitioner palpates to be precise on the location of the pain or MTrPs. For small sized MTrPs, the needle is placed close to the MTrP, for larger areas, the needle is placed in the nearby limb (Fu & Shepherd, 2013). It is suggested the FSN effectiveness can be reduced if placed further away from the site, however, the coverage area is increase, this call the *flashlight* phenomenon (Fu & Shepherd, 2013).

Table 1. Insertion areas corresponding to the diseased region . From "Fu's Subcutaneous Needling, a Modern Style of Ancient Acupuncture?" by Z. Fu and R. Shepherd, 2013, in *Acupuncture in Modern Medicine,* p. 189. Copyright 2013 by InTech.

Diseased Region	**Insertion Area**
Head, face, upper back	Thumb side of the forearm, outside of the upper arm
Chest, epigastric zone	Inner side of the forearm and upper arm
Hypogastrium	Middle part of the inner side of the leg, anteromedial part of the thigh
Low Back	Rear or outside part of the leg, outside of the thigh
Genital, anus	Middle part of the inner side of the lower limb

NOTE: FSN needling is never placed on scars, hollow or prominent areas, olecranon, patella, styloid process of the radius and ulna, malleolus lateralis, or malleolus medialis.

In the state of California, acupuncturists are not required to use alcohol to swab the area before needling insertion as long as the area is clean (Brett, 2017). With FSN, it is highly advised to use iodine, or in the very least, alcohol to clean the area prior to insertion(Fu et al., 2012).

The essential part of FSN needling is the swaying movement of the needle and needling distal from the site and on the ipsilateral side (Fu et al., 2012). These swaying movements are done in a smooth fashion, back and forth, keeping the thumb on the fulcrum and the index, middle, and ring finger in a straight line (Fu & Shepherd, 2013). The middle finger and thumb hold the needle in such a way that they are directly across from each other. The swaying is done at a rate of 100 times per minute for a duration of two minutes. While the swaying is being done, the patient is to move the relevant joint first actively then with resistance from the practitioner. This method is known as the *reperfusion approach* (RA). Once the patient no longer feels pain, the swaying can be stopped (Fu & Shepherd, 2013). In this case study, the needle was then left while the patient rested for approximately 20 minutes. The recommended course of treatment is to leave in the soft plastic and have the patient move around for around an hour. This is not feasible in the U.S. In this case study, leaving the patient for 20 minutes was effective.

Possible Mechanisms of the Subcutaneous Area Needling

Subcutaneous tissue is composed of lax connective tissue spread throughout the body including fasciae and interstitial connective tissue (Langevin, Bouffard, Badger, Churchill, & Howe, 2006). Yang et al. (2015) suggest that fascia is innervated mostly by proprioceptive nerves and is composed mostly of collagen and is capable of transmitting electrical signals all throughout the body. They suggest that the placement of the acupuncture needle anywhere in the body stimulates cellular changes that proliferate along connective tissue planes (Langevin & Yandow, 2002)

Case Description

Case History

The patient was an 83-year-old female with chronic pain in the right hip, low back and sciatica on the right side. The patient reported that she had hip arthritis in the left hip. She had been to the clinic one year prior and received one treatment. She discontinued treatments at that time and have since reported treating her pain with Norco and Advil.

Diagnostic Assessment

The patient arrived at the clinic screaming in pain. The most important first step was to get her comfortable on the treatment table and reduce her pain. Palpation identified extreme sensitivity at and around the right hip at and around the greater trochanter. Other sensitive areas included the tensor fascia latae, gluteus medius, gluteus minimums, gluteus max, quadradus lumborum, and illiacus. The pain and sensitivity where correlated with the patient's chronic case of arthritis in the hip. Due to the extreme discomfort the patient was in, once the most sensitive area was identified through palpation, treatment began immediately.

Treatment

Needle Location (right side)	Reperfusion Approach
Ashi point superior to *Huan Tiao* (GB30)	abduct the right leg three times, followed by repeating the motion against resistance
superior and posterior to *jian kua*	external rotation of the hip followed by repeating the motion against resistance.
Lateral side of leg	abduction of the leg with resistance
Swaying motion of a 24G Silver Star 40mm needle for approximately 30 seconds followed by active range of motion then active range of motion against resistance for a total of 2 minutes for each needle. After the finial needle, all three where retained for 20 minutes while the patient rested.	

Outcomes and Prognosis

Immediately after the first treatment, the patient felt relief. She was able to walk out of the office without screaming in pain. At the time of the second appointment, she reported that she was walking better, sleeping better, and reduced the amount of pain medication she was taking. It was not until the sixth day that she felt the pain was starting to increase. After the second treatment, she felt better and was able to walk without her cane out of the office. Seeing how well she responded, the continuation of treatments may be able to significantly reduce the patient's use of medication and provide a better quality of life.

Discussion

FSN proved to be very effective and relatively painless approach to treating chronic hip pain for this 83-year-old female. It is suspected that these results are due to a physiological process within the subcutaneous tissue.

The findings from the literature suggest that FSN, dry needling, and acupuncture may have the same mechanism. Dry needling and FSN have been shown to reduce endplate noise associated with MTrP irritability and pain (Fu et al., 2012; Ge et al., 2011). Dry needling, TA, and FSN work on the facia in a similar manner and hence may have the same mechanisms (Langevin & Yandow, 2001). The benefit of FSN over DN and TA appears to be the simplicity of the technique and the level of comfort the patient experiences with FSN. It would be beneficial for all acupuncturists to know this approach so that they may safely, quickly, and effectively treat a patient in significant pain.

Conclusion

FSN proved to be rapidly effective yet relatively painless approach to treating chronic hip pain. The literature reviewed in this case study have supplied evidence that supports the outcome of this case study. FSN is likely to continue to grow in popularity given the ease and effectiveness of the technique. As further research is done into the physiological components of the subcutaneous tissue, it is likely that the mechanism of FSN needling will be described.

References

Bret, Jennifer. (2015). *Clean Needle Technique: 7th Edition.* United States. Council of Colleges of Acupuncture and Oriental Medicine.

Fu, Z. and Shepherd, R. (2013). Fu's Subcutaneous Needling, a Modern Style of Ancient Acupuncture? *Acupuncture in Modern Medicine.* Croatia. InTech. 179-203. Doi: http://dx.doi.org/10.5772/53970

Fu, Z., Hsieh, Y.-L., Hong, C.-Z., Kao, M.-J., Lin, J.-G., & Chou, L.-W. (2012). Remote Subcutaneous needling to suppress the irritability of myofascial trigger spots: An experimental study in rabbits. *Evidence-Based Complementary and Alternative Medicine. 2012,* 1-8. https://doi.org/10.1155/2012/353916

Ge, H.-Y., Fernández-de-las-Peñas, C., & Yue, S.-W. (2011). Myofascial trigger points: Spontaneous electrical activity and its consequences for pain induction and propagation. *Chinese Medicine*, *6*(1), 1–7. https://doi.org/10.1186/1749-8546-6-13

Huang, Y., Fu., ZH. Xia, DB., Wu, RK. (1998). Introduction to floating acupuncture: Clinical Study on the treatment of lateral epicondylitis. *American Journal of Acupuncture. 26.* 27-31.

Kuan, T.-S., Hsieh, Y.-L., Chen, S.-M., Chen, J.-T., Yen, W.-C., & Hong, C.-Z. (2007). The myofascial trigger point region: correlation between the degree of irritability and the prevalence of endplate noise. *American Journal of Physical Medicine and Rehabilitation. 86*(3), 183–189. https://doi.org/10.1097/PHM.0b013e3180320ea7

Langevin, H. M., Bouffard, N. A., Badger, G. J., Churchill, D. L., & Howe, A. K. (2006) Subcutaneous tissue fibroblast cytoskeletal remodeling induced by acupuncture: evidence for a mechanotransduction-based mechanism. *Journal Cell Physiology. 207*.76-774. https://doi.org/10.1002/jcp.20623

Langevin, H.M. and Yandow, J.A. (2001). Relationship of Acupuncture Points and Meridians to Connective Tissue Planes. *The Anatomical Record, 269*. 257-265. https://doi.org/10.1002/ar.10185

Nahin, R. L. (2015). Estimates of pain prevalence and severity in adults: United States, 2012. *The Journal of Pain, 16(8), 769–780.* doi:10.1016/j.jpain.2015.05.002

Schuchat, A., Houry, D., & Guy, G. P. (2017). New data on opioid use and prescribing in the United States. *JAMA, 318*(5), E1-E2. doi:10.1001/jama.2017.8913

Simons, D. G., Travell, J. G., & Simons, L. S. (1999). *Travell & Simons' myofascial pain and dysfunction: The trigger point manual, Vol. 1*(2nd ed). Baltimore: Williams & Wilkins.

Yang, C., Du, Y. K., Wu, J. Bin, Wang, J., Luan, P., Yang, Q. L., & Yuan, L. (2015). Fascia and primo vascular system. *Evidence-Based Complementary and Alternative Medicine*, *2015*, 1-6. https://doi.org/10.1155/2015/303769