

# Ultrasound Guided Acupuncture: A Case Series

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## ABSTRACT

Acupuncture is an ancient system of medicine which involves introduction of specific needles in described sites into prescribed depths. A few apprehensions about this technique are the close proximity of the needles with vital structures and possible injuries. In the present paper, an attempt was made to use ultrasound which is a non invasive technique of identifying vital structures in two cases and to find out its utility. First case is of a 35-year-old male, with history of alcoholism, presented with a wrist drop, was advised electroacupuncture where the needles were placed in the centre of the muscle bulk with ultrasound guidance to elicit good motor response. Another case, a 45-year-old female patient had tennis elbow where the superficial veins and nerves were avoided before pricking on selected sites. The response was as expected and normal. The first case had satisfactory motor recovery while the second one had adequate pain relief. There was neither bleeding from any site nor any other complications. A survey scan of the puncture site can be advised before inserting acupuncture needles. Ultrasound guided acupuncture is feasible without compromising the traditions. This concept becomes easier as ultrasound and acupuncture have been conveniently handled together by anaesthesiologists.

**Keywords:** Complementary, Medicine, Needle, Pain, Vision, Wrist drop

## INTRODUCTION

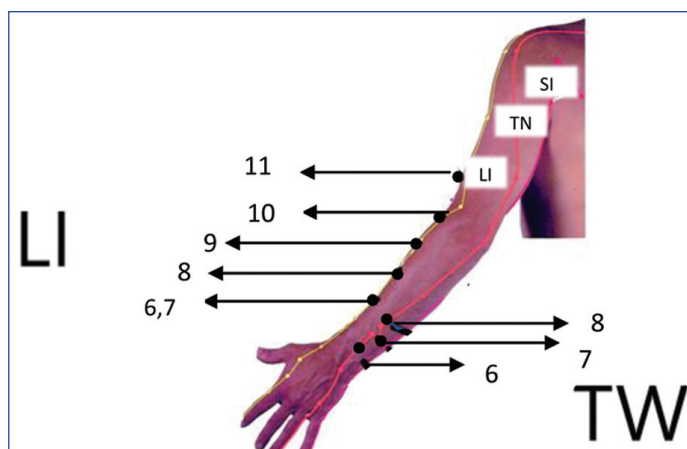
Acupuncture is an ancient method of treating certain diseases by inserting solid thin needles into various parts of the body at predicted and established depth. There are a variety of indications including muscle stimulation and different conditions with acute and chronic pain [1]. In few patients with motor weakness, the depth of insertion may not be precise to get adequate contraction. Even though an experienced doctor can do it, any instrument which helps in achieving the goal may be more effective. Bleeding from the site and nerve injuries are a few of the complications of acupuncture [2]. To decrease the incidence of side-effects [3], the author attempted to use ultrasound to guide the needle to the space and see the effects. Even though there are studies of ultrasound use in acupuncture, authors wanted to promote with an idea that acupuncture and ultrasound are in the armamentarium of a single speciality namely anaesthesiology.

## CASE SERIES

### Case 1

A 35-year-old male presented with the chief complaint of weakness of the left wrist for one day. There was history of alcohol consumption the day before. There was no other co-morbidity and patient was not on any other drugs. On examination there was no sensory loss with motor power of 1/5 of the extensors of the wrist. On clinical examination, the patient was diagnosed as left wrist drop and confirmed by a physician. The patient was not willing for further investigations and was advised about the pros and cons of electroacupuncture. An informed consent was obtained for Ultrasonography (USG) guided needling and was attempted in many prescribed points. DU20, Lithium (Li) 6,7,8 and Triple Warmer (TW) 6, 7 and 8 [Table/Fig-1]. As part of the brief explanation of the above said points, Baihui (DU20), is an acupuncture point in humans located on the top of the head where there is an intersection of middle sagittal line with connecting line of two ear apices. It is generally used as sedative and homeostatic point. The Li points like

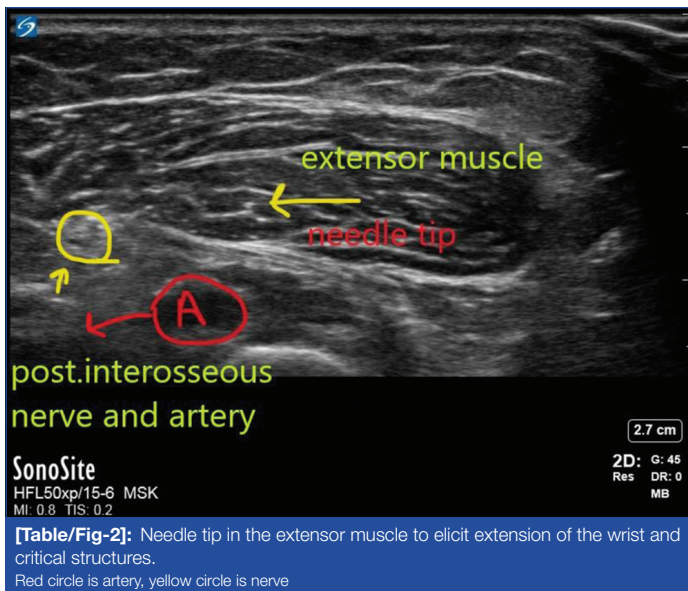
6 and 7 can be used to treat oedema and local inflammations. The classic Hegu or Li4 is the proven analgesic point in acupuncture.



**[Table/Fig-1]:** Different needle points.

TW: Triple warmer; SI: Small intestine; LI: Large intestine

Triple Warmer (TW) channel is the meridian which commands our fight, flight, or freeze response. The TW also has impact on the immune system. A survey ultrasound was done on the forearm points to detect any critical structures and if any, the introduction of needle was adjusted by a few mm to avoid damage [Table/Fig-2]. An electrical stimulation of the points was done by dense disperse type as the acupuncturist was familiar with this technique of stimulation. The tip of the needle was seen in the centre of the muscle. There were clear motor movement of the muscles. The extensor muscles of the wrist was targeted. The treatment schedule was continued for two weeks with anti-inflammatory drugs and vitamins. After this schedule of treatment ranging from 25-30 minutes daily, the power regained to 3/5 to 4/5 and was advised to continue physiotherapy at home. The needles were removed usually after Partha's acupuncture needle removal criterion [1]. The patient was almost able to do his work in one month's time with continued physiotherapy. There were no complications. This classification of motor power is well established for four decades.



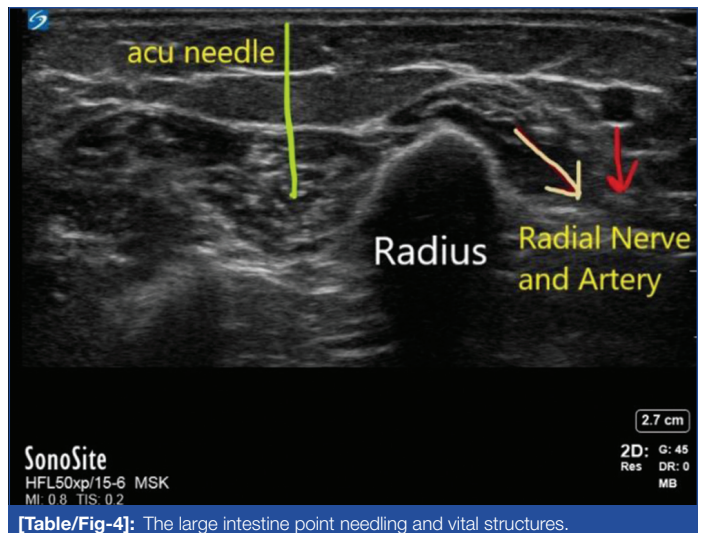
## Case 2

A 45-year-old female came with the complaints of left sided elbow pain for the past three months. The onset was insidious and the profile was progressive. There was no other medical history or drug intake. On clinical examination, the patient was diagnosed with (Lateral epicondylitis) tennis elbow. Informed consent was obtained by the patient. The diagnosis was confirmed by an Orthopaedic Surgeon. All routine investigations including renal function tests, complete blood count, Hepatitis B Surface Antigen test (HbsAg), Human Immunodeficiency Virus (HIV) and X-ray elbow were normal. The visual analogue scale reading was 7-8/10. The patient was counselled about acupuncture treatment. The points, Du20, Li 4, 10, 11, 12 and Ashi points were used [Table/Fig-1].

The relief began for the patient in terms of pain in the third sitting with a reduction in the pain scores to 2- 3/10 in 10 sittings. There was a significant improvement in joint movement as there was a significant decrease in pain. The needle insertions were done after a preliminary ultrasound survey of points to find out any vessel or critical neural element. The ultrasound machine was used to guide needle insertion [Table/Fig-3]. An electrical stimulation of the points were done by dense disperse type as the acupuncturist was familiar with this technique of stimulation. The needle tip was well visualised inside the centre of the extensor muscle of the wrist avoiding nearby vessels [Table/Fig-4]. All ultrasound scanning was done with the SonoSite X porte machine with High Frequency Linear (HFL) probe 6-15 MegaHertz. The needles were inserted with real time ultrasound guidance and deqi was elicited in all points.



**[Table/Fig-3]:** Ultrasound guided acupuncture.



## DISCUSSION

Headache, migraine, postoperative pain, osteoarthritis of the knee, postherpetic neuralgia, other types of neuralgia are some of the different indications in the field of algology. Complex pain syndromes and muscle weakness associated with it is usually corrected better with acupuncture [3]. In few patients with motor weakness, the depth of insertion may not be precise to get adequate contraction. Bleeding from the site of insertion and nerve injuries have been reported [4]. Hence, as the science moves, the needling can be made more scientific. In allopathic medicine, ultrasound has slowly become the sine qua non in regional anaesthesia and nerve blocks. It can also be used to assist biopsies. The location of blood vessels for easier cannulation in adults, infants and neonates has revolutionised the use of ultrasound [5]. With regard to acupuncture, there is a study which established a scientific introduction of needles for assessing the depth [6]. The soft tissue movement on rotation and the elicitation of deqi has been studied. A few studies have been done on the changes in blood vessel diameter and blood flow after acupuncture [7,8].

Park JJ et al., has described the sensation after needling in acupuncture is better with ultrasound guidance than assistance [9]. Even though it was a small volunteer study; it promoted the gadget use in the traditional art. As the present work was a simple case series of only two cases, authors did not find any comparative analyses but the passage of needles was uneventful. Cai HH and Wang LL has described, identifying the sacral points are difficult without the aid of acupuncture and they have proved that acupuncture can precisely locate such points [10]. The rate of complications can be decreased by knowing the anatomy and physiology of the points and moving the pricking site by a mm to avoid injuries of critical care areas. In a systematic review of 10 years the incidence of complications is as low as 1.8 per 1000 treatments. Infections formed the major group while the other organ injuries were rare [11]. Pneumothorax was also reported. Huisma F et al., has reported a case of pneumothorax after scapular acupuncture and they have insisted that such points close to chest need vigilance for respiratory signs after needling [12]. With ultrasound, the exact depth of the pleura can be identified and it can help to avoid organ injury.

The essence of using ultrasound prior to needling can be helpful to scan the possible sites of insertion and the structures deep to them. In authors experience, bleeding by inadvertent puncture of a superficial vein is very common in clinical practice especially in points like Li 10 and Li 11. On rare occasions, a superficial artery can be pricked and bleeding can be a little excessive. Other than bleeding, an inadvertent arterial injury can be thrombogenic

in atherosclerotic arteries. There are many nerves close to the skin and the superficial muscles. Acupuncture at P6 has been extensively studied and used for the control of postoperative nausea and vomiting but the insertion point is close to the path of the median nerve [13]. Kessler J and Streitberger K reported a rare case of median nerve injury with acupuncture [14]. Ultrasound can help avoiding nerves but it is essential to have the knowledge of both the techniques to decrease side-effects. Any electrical stimulation of the nerves can be injurious to them. This can also be uncomfortable to the patient depending upon the fibres they carry. Allen D in their study has noted that real time needle visualisation by guided than assisted techniques have been more precise with less complications [15].

Hence, an attempt was made to guide with real time visualisation. From this small case series, it was justified that ultrasound may be helpful in the coming years to guide acupuncture needling. The technique and points are not going to change. The elicitation of deqi is going to be similar. Deqi refers to the participant's subjective feelings and the body responses. It also includes the acupuncturist's perceptions while the acupuncturist needles certain points. Even though the presently described complications are less, it can be possibly further be decreased by using gadgets. It is important to study the aspect in larger multicentric samples.

## CONCLUSION(S)

In this case series, ultrasound guidance was used for needling acupuncture needles for the desired effect and to avoid critical injuries to important anatomical structures. Ultrasound assistance can be helpful in detecting the depth of needles in acupuncture. The real time visualisation can possibly decrease injuries to vital structures during the procedure. The concept assumes significance in the fact that acupuncture is handled by anaesthesiologists who have reasonable knowledge in ultrasound scanning to detect vital structures.

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## REFERENCES

- [1] Parthasarathy S, Mohamed H. Efficacy of electro acupuncture in Bell's Palsy– A clinical interventional pilot trial in Indian patients. *International Journal of Contemporary Medical Research*. 2019;6(6):F15-18.
- [2] Ravishankar M, Parthasarathy S. Acupuncture: Does it need a real relook? *J Basic Clin Appl Health Sci*. 2019;2(3):87-88.
- [3] Parthasarathy S, Thirlogasundary M. Use of electro acupuncture in the treatment of complex regional pain syndrome– A case series study. *European Journal of Biomedical and Pharmaceutical Sciences*. 2015;2:179-81.
- [4] Xu S, Wang L, Cooper E, Zhang M, Manheimer E, Berman B, et al. Adverse events of acupuncture: A systematic review of case reports. *Evid Based Complement Alternat Med*. 2013;2013:581203. Doi: 10.1155/2013/581203.
- [5] Madhula P, Priya H, Parthasarathy S. Are gadgets saviours in salvaging sick cases– ultrasound for both nerve blocks and vascular access in a case of septic shock. *Asian Journal of Pharmaceutical and Clinical Research*. 2021;14(2):04-05. Doi: <https://doi.org/10.22159/ajpcr.2021.v14i2.40064>.
- [6] Chou PC, Chu HY, Lin JG Safe needling depth of acupuncture points. *J Altern Complement Med*. 2011;17:199-206.
- [7] Konofagou EE, Langevin HM. Using ultrasound to understand acupuncture. *Eng Med Biol Mag IEEE*. 2005;24:41-46.
- [8] Leow MQH, Cui SL, Mohamed Shah MTB, Cao T, Tay SC, Tay PKC, et al. Ultrasonography in acupuncture: Potential uses for education and research. 2017;10(3):216-19.
- [9] Park JJ, Akazawa M, Ahn J, Beckman-Harned S, Lin FC, Lee K, et al. Acupuncture sensation during ultrasound guided acupuncture needling. *Acupunct Med*. 2011;29(4):257-65. Doi: 10.1136/aim.2010.003616.
- [10] Cai HH, Wang LL. Deep acupuncture at Baliao points (eight sacral foramina) by Professor WANG Ling-Ling and its clinical application. *Zhongguo Zhen Jiu*. 2014;34:285-88.
- [11] Lao L, Hamilton GR, Fu J, Berman BM. Is acupuncture safe? A systematic review of case reports. *Alternative Therapies in Health and Medicine*. 2003;9(1):72-83.
- [12] Huisma F, Konrad G, Thomas S. Pneumothorax after acupuncture. *Can Fam Physician*. 2015;61(12):1071-73.
- [13] Lee A, Fan LT. Stimulation of the wrist acupuncture point P6 for preventing postoperative nausea and vomiting. *Cochrane Database Syst Rev*. 2009;(2):CD003281. Apr 15. Doi: 10.1002/14651858.CD003281.
- [14] Kessler J, Streitberger K. Perforation of the median nerve with an acupuncture needle guided by ultrasound. *Acupunct Med*. 2008;26:231-33.
- [15] Allen D. Precision of acupuncture placement using diagnostic ultrasound. *Int Musculoskelet Med*. 2014;36:64-74.

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