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Original Contribution

TOPOGRAPHOANATOMICAL CHARACTERISTIC of the ACUPUNCTURE POINT LI4 (Hegu) and IRRADIATION of the FEELINGS DURING MANIPULATION

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ABSTRACT

The main goal of this study is to explain the specific feelings that accrue during acupuncture stimulation of Hegu (U_4). The main data about the topographic anatomical structure of the area of the hand was collected, systematized and analyzed. The anatomical area of the point was studied layer by layer in details during dissections and in literature and all information was used to explain the classical formulation of the traditional Chinese medicine (TCM). As results we established that there is correspondence between the anatomical structures in the area that and the irradiation that has not been taken under attention so far.

Key words: GI_4, LI_4, TCM, anatomy, acupuncture.

INTRODUCTION

The acupuncture as a method of treatment is becoming more and more popular and its role in every day practice is growing. The responsibility is growing as well, and all questions that are not absolutely clear need to be examined.

The Hegu point GL (LI_4) is one of the most important and most frequently used, however there is not enough information about the topography and the anatomical structures involved in the formation of the feelings, and the healing effect as well. According to TCM the point Hegu belongs to the canal of the large intestine and is one of the four main points of the human body. Generally the feelings during stimulation of an acupuncture point go along the canal that the point is from. The large intestine canal is situated on the external site of the upper extremities and has external and internal course. The external course starts from the radial nail edge of the index finger goes on the radial edge of the finger, passes trough LI_4 point, continues on the anterior-lateral side of the upper extremities and reaches the supraclavicular fossa. From here the external course continues up on the lateral side of the neck crosses the lower jaw goes around the upper lip and ends next to the contra lateral of the nose in the LI_2o point. From supraclavicular fossa the internal course of the canal is started. It goes through the lung, the diaphragm and reaches the colon [2]. Fig. 1, Fig-2.

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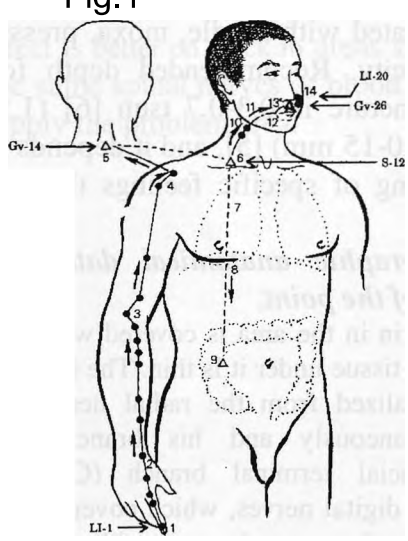
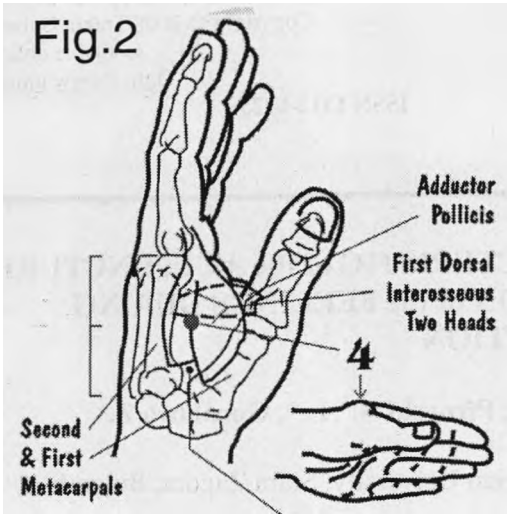
Fig.1

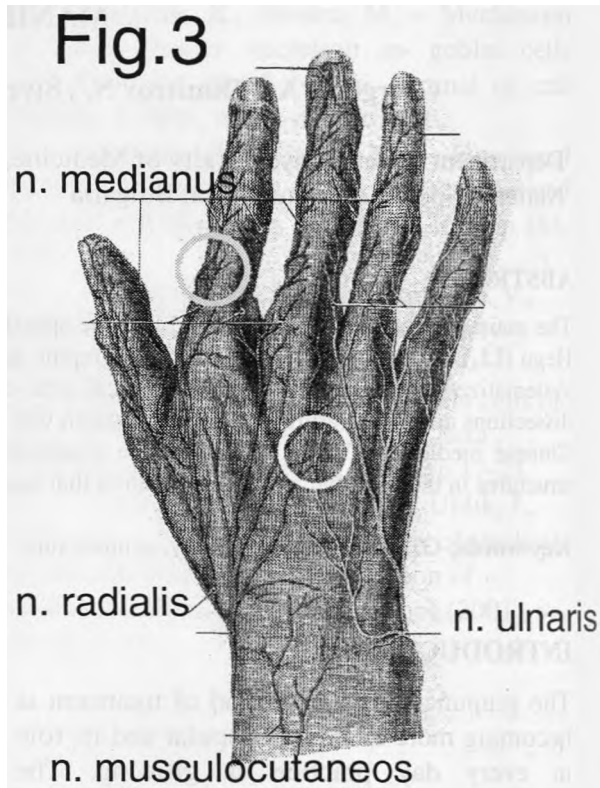




The name of the Hegu points translated from Chinese means: he - *place of junction* and **gu** - *mountain gorge,* this is explained as a place were the thumb and the index finger come together and form a gorge. Its location is on the back of the hand between the first and the second metacarpal bone closer to the radial side of the second bone approximately on the middle of the bone. When the fingers are moved away a small pit is formed on the place of the point. Other way to find it is to place the fold between the distal and the middle phalanges of the thumb of the right hand on the level of the skin flap between the thumb and the forefinger of the left hand the top of the right thumb will show us the point LI_4 [6]. After pressure at this place pain could be felt, as well as numbness and warmness. This point is recommended for treatment of pain in the head, face, mouth and upper limb; constipation, flue, nonspecific gingivitis, colitis, toothache and during dental manipulation for anaesthesia, ect. [2]. Its use is forbidden during pregnancy due to its powerful effect. LI_4 could be stimulated with needle, moxa, pressure or electricity. Recommended depth for the acupuncture is 0.3-0.7 tsun [6] (1.5 cm) [4], (10-15 mm) [5], and it depends of the accruing of specific feelings through the canal.

Topographic anatomical data for the area of the point.

The skin in the area is covered with hair and the fat tissue under it is thin. The innervations are realized from the radial nerve situated subcutaneously and his branches - the superficial terminal branch (C_5-Th_1), the dorsal digital nerves, which cover the skin of the thumb up to the nail without the palm side, and the skin of the index finger up to the middle phalange without the palm side. The interesting here is the anastomosis between the branches of the radial nerve and the median nerve on the top of the firs two fingers; and a communicant ulnar branch between the superficial branch of the radial nerve and the dorsal branch of the ulnar nerve [3], Fig.3 [8].



In the subcutaneous tissue dorsal metacarpal veins are situated and they form dorsal venous network [7]. It is important to know their localization in order to prevent injury. Generally the cephalic vein has a direct continuation of dorsal metacarpal vein I [1]. The lymph drainage is fulfilled by the lymph vessels following the veins.

There are two muscles important for this study - the dorsal interosseus muscle I and the adductor pollicis because hegu is situated between the heads of the first one and the acupuncture needle may reach the second one. Their nerve supply is from the deep terminal branch of ulnar nerve (C_8-Th_1) [1].

The arterial system is a direct branch of the radial artery and includes dorsal metacarpal artery I, which divides on two branches for the adjacent edges of the fist two fingers - dorsal digital artery V and dorsal digital artery I. Radial artery gives two other branches in its deeper course - a. princeps pollicis and a. radialis indicis, which is

situated between the two heads of metacarpal dorsal muscle **I.** A. radialis indicis descents the metacarpal dorsal muscle I and transverse head of adductor pollicis muscle, running along the lateral side of the index to its extremity [9]. Anomalies and variation are often [3]. In some regions there is a concentration of receptors around the arteries and they are called reflexively areas. Probably this is such a zone on the hand.

The autonomic nerve supply of the area is performed by sympathetic nerves coming from the middle cervical sympathetic ganglion C_5-C_6 and cervicothoracic (stellate) ganglion from C_7-Th_1. The sense supply is performed by the spinal nerves C_5-Th_1 [3].

GOALS

The goal of the present study is to establish, analyze and systemize the anatomical data for the area of the acupuncture point GI4, to find the precise localization and to analyze and explain the path of the subjective feelings in the patients.

MATERIALS AND METHODS

Clinical studies of the practice of the authors were used to illustrate and systemize the subjective feelings in the patients. Dissections and comparative analysis of the literature was preformed to prove the anatomical substrate.

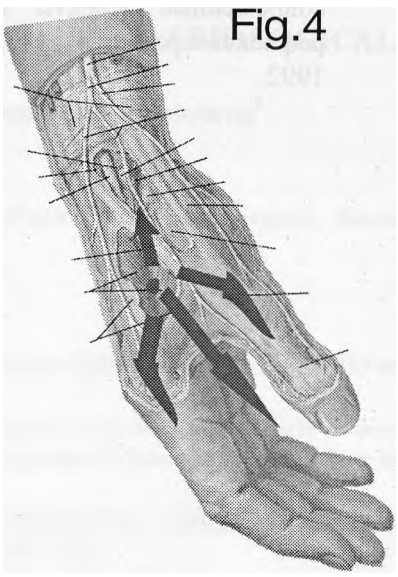
DISCUSSION:

Most often patients reported numbness and warmness on the place of the prick irradiating to the index finger and up to the forearm along the canal, which is described in the TCM textbooks as normal. Some patients had feelings going to the small finger and the thumb and a few patients reported warmness in the area of the colon. All the patients with stiffness in the nose were relieved. Fig. 4.

Touching the branches of radial superficial nerve easily explain feelings in the pointer finger the thumb and up along the canal [9].

However stimulation in the same direction could be induced by the irritation of the blood vessels - veins in the subcutaneous tissue and the arteries in the muscles, which also have good afferent and sympathetic innervation [8]. The impact on the deep muscles activates receptors of deep terminal branch of ulnar nerve and this explains the irradiation towards the small finger [1]. That could be explained also by communicant ulnar branch between superficial radial nerve and dorsal branch of ulnar nerve[3].

The other feelings in the nose and the abdomen are much harder to explain but we are almost sure that there are due to reflex of the autonomic nerve system as a response to the irritation in LI_4, which is about to be proven and described [7].



CONCLUSIONS

1. The stimulation of Hegu (LI_4) has powerful effects on the autonomic nervous system (vasodilatation, asleep etc).
2. The effect is related to muscles, nervous system and blood supply, but there is an indirect connection to viscera through them.
3. Effect is better on prick in areas supplied by the same spinal nerves or blood vessels as supply the problem area.

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