An understanding of anatomy under the LI4 acupuncture point

Acupuncturists may apply a needle into different locations for a given acupuncture point. This may raise doubts and uncertainty about the efficacy of acupuncture treatments, and cause complications in acupuncture research and education. For example, the LI4 point located in the first web-space of the hand is one of the most commonly used acupuncture points, but the placement of LI4 is slightly different in standard textbooks used for teaching acupuncture in China and Taiwan. For illustration, the two LI4 placements are named as LI4-P (proximal) and LI4-D (distal) in the following text (figure 1).

LI4 needling may potentially injure the palmar metacarpal artery (PMA) on the radial palmar aspect of the second metacarpal or the princeps pollicis artery (PPA) on the ulnar palmar aspect of the first metacarpal, which both pass between the first dorsal interosseus and the adductor pollicis muscles. The resulting intermuscular bleeding may lead to scar adhesions formed at the muscles and, consequently, decreased range of motion of the thumb.

To estimate the relationship between the two LI4 skin placements and the PMA and PPA, we conducted a preliminary MRI study that captured transverse MRI on 10 healthy young men with their dominant forearms neutrally positioned. A consistent pattern was seen, with a distance between the LI4 placement and the PMA of about 1 cm while the PPA is not close to the placement or cannot be reached; also, the distance of the artery beneath the LI4-D placement is roughly 25% greater than that of LI4-P (figure 2).

It is of clinical importance that the needles should not be inserted deeply at the LI4 to minimise the risk of penetrating injury of the arteries underneath. Based on the above, needling at LI4-D may be preferable to LI4-P for patients with hand muscle atrophy since the PMA is relatively deeper under the placement of LI4-D.

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