Review

Anatomic Review of Eleven Important Canine Acupuncture Points
Part I: Thoracic Limb

Martha A. Littlefield DVM, MS, CVA

ABSTRACT

Two papers (Part I and Part II) review eleven commonly used acupuncture points and the relative anatomy associated with these points. Common anatomical structures are demonstrated with their relationship to needle placement in dogs with some comments on the cat.

Keywords: Canine anatomy, acupuncture, traditional Chinese veterinary medicine

ABBREVIATIONS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Definition</th>
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<tbody>
<tr>
<td>mm</td>
<td>muscles</td>
</tr>
<tr>
<td>m</td>
<td>muscle</td>
</tr>
<tr>
<td>n</td>
<td>nerve</td>
</tr>
<tr>
<td>a</td>
<td>artery</td>
</tr>
<tr>
<td>v</td>
<td>vein</td>
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As a veterinarian continues to improve the day-to-day use of various acupuncture points, knowledge of the underlying anatomy is important. Within the traditional Chinese veterinary medicine (TCVM) methods of point selection and coordination with the various concepts of the Five Elements is a basis in anatomy. Intimate knowledge of anatomic structures associated with acupoint location provides two important benefits. The first is the practical benefits of identifying the correct location of the point on the animal’s body. The second benefit is a basis to understand some of the local and remote therapeutic effects of an acupuncture point by understanding nerves, vessels, muscles and fascia intimately associated with the point.

To begin a discussion of anatomy, it is important to understand acupoint nomenclature which is divided primarily into traditional and western nomenclature systems. In the traditional (classical) nomenclature, acupoints are named based on anatomic location (“Wei-jian”, “tail” “tip”), association with Zang-fu organs (“Wei-shu”, Stomach association point, “stomach-back”), therapeutic (“Duan-xue”, “stopping hemorrhage”) and symbolic (imaginative descriptive names to suggest location: “Long-hui”, “Dragon Meeting”). Western nomenclature assigns a unique combination of letters and numbers that correspond to an acupoint location on one of the 14 meridians (LI-11, BL-23), (Figures 1 and 2).1

Acupoints are typically located in or near muscles, blood vessels, lymph vessels and nerves.1, 2 Each acupoint has a unique location and physiological effect (Figure 3). With this in mind, the anatomic location of eleven common canine acupuncture points will be presented with a discussion of the detailed anatomy associated the needle placement.

ACUPUNCTURE POINT CLINICAL ANATOMY

Large Intestine 10

Large Intestine 10 (LI-10; Qian-san-li) is known as the “Front 3 Mile” (or Three mile) Point. This point is very commonly used for immune regulation (immunodeficiency), Qi Deficiency, dental pain, pruritus, diarrhea, Wind-Heat, elbow pain, abdominal pain, front limb lameness/paresis/paralysis, pelvic limb and generalized weakness.3

Anatomical Information

Its location on the craniolateral aspect of the thoracic limb is described as 2 cun distal to LI-11 (1/6 of the distance between the elbow and the carpus) between the extensor carpi radialis and common digital extensor muscles (mm), (Figure 4). To locate the acupoint, it is critical to identify the groove between the extensor carpi radialis muscle (m)
**Figure 1:** Western nomenclature system where a unique combination of letters and numbers associated with each of the 14 meridians are used to name an acupuncture point. The Bladder meridian is illustrated in this figure.¹

**Figure 2:** The 14 meridians with abbreviations and number of acupoints located on each meridian that form the basis of naming acupuncture points by the Western nomenclature system.

<table>
<thead>
<tr>
<th>Meridian name</th>
<th>Abbreviation</th>
<th>Number of Points</th>
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<tbody>
<tr>
<td>Lung</td>
<td>LU</td>
<td>11</td>
</tr>
<tr>
<td>Large Intestine</td>
<td>LI</td>
<td>20</td>
</tr>
<tr>
<td>Stomach</td>
<td>ST</td>
<td>45</td>
</tr>
<tr>
<td>Spleen</td>
<td>SP</td>
<td>21</td>
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<tr>
<td>Heart</td>
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<td>9</td>
</tr>
<tr>
<td>Small Intestine</td>
<td>SI</td>
<td>19</td>
</tr>
<tr>
<td>Bladder</td>
<td>BL</td>
<td>67</td>
</tr>
<tr>
<td>Kidney</td>
<td>KID</td>
<td>27</td>
</tr>
<tr>
<td>Pericardium</td>
<td>PC</td>
<td>9</td>
</tr>
<tr>
<td>Triple Heater</td>
<td>TH</td>
<td>23</td>
</tr>
<tr>
<td>Gallbladder</td>
<td>GB</td>
<td>44</td>
</tr>
<tr>
<td>Liver</td>
<td>LIV</td>
<td>14</td>
</tr>
<tr>
<td>Conception Vessel</td>
<td>CV</td>
<td>24</td>
</tr>
<tr>
<td>Governing Vessel</td>
<td>GV</td>
<td>28</td>
</tr>
</tbody>
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**Figure 3:** Acupuncture points are located at very unique anatomic sites in the body.²

**Figure 4:** Acupuncture needle placement at LI-11 and LI-10.

**Figure 5a:** Local anatomy of muscles, nerves and blood vessels (cranial to craniolateral aspects) associated with LI-10 and LI-11 in dogs.

**Figure 5b:** Deep muscles of shoulder and muscles of arm (lateral aspect).
and common digital extensor mm (Figure 5). The cephalic vein travels just superficial to the extensor carpi radialis mm in the proximal antebrachium. Careful palpation of this area allows the separation of the thick fascicles of the two muscles. The tendon of the extensor carpi radialis mm is centrally located on the dorsum of the carpus as it passes to the metacarpal tuberosities on the proximal dorsal aspect of metacarpals II and III. 1,3

The common digital extensor muscle tendon resides in a groove in the distal radius just lateral to the groove for the extensor carpi radialis mm and inserts on the extensor process of the distal phalanges of digits 2-5. The diligent veterinarian can palpate the four bellies of the common digital extensor mm. The elbow joint capsule has an out-pocketing deep to the head of the common digital extensor mm. As the name implies, the muscle acts to extend the four principle digits. Both muscle tendon units are covered by a thick fascia on the cranial surface.

The extensor carpi radialis and common digital extensor mm are innervated by the radial nerve (n), the key nerve to the thoracic limb (Figures 6 and 7). More specifically, these two major extensors of the carpus and digits are innervated by the deep branch of the distal branch of the radial nerve. The proximal branch of the radial n innervates the triceps brachii mm that is the key muscle group involved in fixing the elbow joint. The placement of the needle between the extensor carpi radialis mm and the common digital extensor muscle in a long linear pattern or perpendicular to a dry-needle depth of 1-1.5 cun penetrates the thick fascial plane covering the antebrachium. This fascia is important as it lends further support to these muscles and allows them to work effectively as a group.

Comment
The thoracic limbs bear the bulk of the body’s weight (~60%). The nickname “Front Three Mile” is thought to have come from the value of this muscle group swinging the forelimb and manus (metacarpals and phalanges) forward. The manus must be extended during the swing phase and be able to support the animal in the stance phase. Elbow flexion can occur with the extensor carpi radialis mm during the early swing phase. It remains quiet mid-phase but becomes active again in the late swing phase coinciding with carpal extension and paw placement prior to touchdown.

Large Intestine 11

Large Intestine 11 (LI-11; Qu-chi) is known as the “Pool on the Bend” Point. It is a commonly used point as a He-sea point (Earth), Mother (tonification) point for Deficiency disease patterns. In addition, it is often used for abdominal pain, vomiting, diarrhea, constipation, elbow pain, pharyngitis, dental pain, uveitis, fever, hypertension, epilepsy, thoracic limb paresis or paralysis, Wind Heat and pruritus.1

Anatomical information

The location of this acupuncture point is found on the lateral side of the thoracic limb at the lateral end of the cubital crease. It is one-half the distance between the biceps brachii tendon and the lateral epicondyle of the humerus when the elbow is flexed (Figures 4, 8). The biceps brachii tendon is truly two parts (heads), with each inserting on the radial or ulnar (larger head) tuberosities (Figure 9). 1,3

The terminal tendon of the brachialis mm inserts between the two parts of the biceps tendon and can be

**Figure 6:** Important anatomic features adjacent to LI-10 and LI-11. The distal lateral head of the triceps brachii has been removed, as have the heads of the extensor carpi radialis and common digital extensor mm.

**Figure 7:** Anatomic location (cranial to craniolateral aspects) of the cephalic vein and radial nerve near LI-10 and LI-11
**Figure 8:** Location of LI-11; one-half the distance between the biceps brachii tendon (medial to extensor carpi radialis in this picture) and the lateral epicondyle of the humerus when the elbow is flexed.

**Figure 9a:** LI-11; the biceps brachii tendon has 2 insertions (radial & ulnar tuberosities). The terminal tendon of the brachialis m inserts between the two parts of the biceps tendon.

**Figure 9b:** Muscles of thoracic limb, medial view.
palpated as the lateral most tendon in this area. In addition, a thick piece of fascia penetrates the belly of the muscle almost to the bone creating a groove making the shape of the biceps brachii muscle double pennate. These fascial fibers extend distally to assist the shoulder in a passive stay apparatus as in the horse. The distal fascial strands extend into the groove between the pronator teres m and the extensor carpi radialis m and then cross the proximal antebrachial muscles to spread into the antebrachial fascia corresponding to the lacertus fibrosus in the horse.

Comments
The main tendon of insertion of the biceps brachii muscle is medial to the tendon of the brachialis m. To feel the lacertus fibrosus, stabilize the shoulder and extend the elbow. The lateral epicondyle of the humerus is the largest lateral protrusion on the elbow. Deep within this area is a median cubital vein connecting the cephalic vein to the brachial or superficial brachial vein. This is the vein that is compressed when collecting blood from the cephalic vein (Figure 7).

Heart 7
Heart 7 (HT-7, Shen-men) is known as the “Spirit Gate”. Common uses for HT-7 include Shu-stream point (Earth), Yuan-source point, child point (sedation) for Excess disease patterns, Shen disturbance, anxiety, thoracic pain, poor memory, restlessness, epilepsy, mania and sleep disorders.

Anatomical information
Its location is found by palpating the lateral side of the carpal joint in the large depression lateral to the tendon

Figure 10: Location of HT-7 on the lateral aspect of the thoracic limb in the depression lateral to the tendon of the flexor carpi ulnaris muscle and caudal to the tendon of the ulnaris lateralis muscle.

Figure 11: HT-7 local anatomy. Note the location of the flexor carpi ulnaris m and tendon of the ulnaris lateralis muscle.
of the flexor carpi ulnaris m and caudal to the tendon of the ulnaris lateralis m. The needle must be passed underneath the flexor retinaculum (with perpendicular insertion or oblique insertion) into this depression and medial to the accessory carpal bone (Figures 10, 11 and 12).

Both the ulnaris lateralis m and the flexor carpi ulnaris insert on the accessory carpal bone (Figure 11). The ulnaris lateralis also inserts on the lateral side of the proximal end of metacarpal V. This arrangement forms a trough (carpal canal) that is easily palpated when the carpus is flexed (Figure 11). Placing a needle into the carpal canal does lead to a few challenges anatomically. The median artery, the main blood supply to the manus, is centrally, if not slightly medially, located within the carpal canal between the superficial and deep digital flexor mm. The closest anatomical items of interest are the ulnar nerve and caudal intersosseous artery both placed close to the accessory carpal bone (Figure 12).

Comments

HT-7 is one of the easier acupoints to locate and well tolerated by most animals.

Pericardium 6

Pericardium 6 (PC-6, Nei-guan) is known as the “Inner Pass”. It is a Luo-connecting point of the Pericardium Channel, master point for the chest and cranial abdomen and confluent point of the Yin-Wei Channel. It is used for Shen disturbances, anxiety, sleep disorders, headache, epilepsy, vertigo, vestibular disorders, thoracic pain, cardiac arrhythmias, paresis or paralysis of forelimbs, vomiting and nausea.¹

Anatomical information

This acupuncture point is located on the medial side of the thoracic limb, 3 cun proximal to the transverse crease of the carpus in the groove between the flexor carpi radialis and the superficial digital flexor mm into the intersosseous space (opposite TH-5 on the lateral side). Rotate the manus so that the palmar surface faces medially (supinate the manus) and insert the needle into the intersosseous space (Figure 13). There are several nerves and arteries traveling through this area. The median nerve, median artery and caudal intersosseous artery (located deeper in the intersosseous space) are all possible targets for an acupuncture needle.

The flexor carpi radialis m is easy to palpate on the caudomedial portion of the distal radius in this area (Figure 14). Deep to this muscle is the radial and humeral heads of the deep digital flexor m. The flat tendon of the flexor carpi radialis m travels through the carpal canal and inserts on the palmar side of the base of metacarpals II and III (Figure 15). This muscle contains many fatigue-resistant muscle fibers to support locomotion; especially in its role of flexion of the carpal joint. Interestingly, the muscle components (slow twitch fibers) are decreased in the cat.

The superficial digital flexor m is primarily a tendon at the PC-6 location and lies directly underneath the skin. It covers the deep digital flexor muscle (Figure 15). The superficial digital flexor tendon travels through the carpal canal lateral to the cephalic vein. With the carpal canal, the flexor retinaculum separates the tendon from the caudal intersosseous artery (a), caudal intersosseous vein (v), ulnar n (closest to the accessory carpal bone). In addition, it separates the median n and median a that reside on the palmar surface of the tendon of the deep digital flexor muscle. An acupuncturist should be cognizant of the many functional structures in the carpal canal.

Comments

The median and/or ulnar nerves provide motor

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**Figure 12:** Carpal canal (medial aspect) with Ulnar nerve and Median artery. The flexor retinaculum is being restrained.

**Figure 13:** Location of the PC-6 acupuncture point on the medial aspect of the thoracic limb.
innervation to the flexors of the carpus and digits and provide sensation to the metacarpal pad. These two nerves arise from cervical nerve 8 (C8) and thoracic nerve 1 (T1) that also supplies the lateral thoracic nerve to the cutaneous trunci (important in the panniculus response). When locating PC-6, coordinate the use of Triple Heater 5 (TH-5) opposite PC-6 on the lateral side of the limb.

**Triple Heater 5**

Triple Heater 5 (TH-5, Wai-quan) is known as the “Outer Pass”. It is considered a Luo-connecting point of the Triple Heater Channel and confluent point of the Yang-Wei Channel. It is used for thoracic limb lameness, paresis or paralysis of forelimbs, fever, headache, carpal pain, conjunctivitis, otitis, neck pain, intervertebral disc disease, carpal pain and Wei Qi deficiency.¹

**Anatomical information**

Its location is described as 3 cun above the carpus on the craniolateral aspect of the forelimb in the interosseous space between the radius and ulna (directly opposite PC-6 on the medial aspect), (Figure 16). Supinate the paw to introduce the needle into the interosseous space between the radius and ulna from the lateral side (Figures 17 and 18). Like PC-6, there are a number of anatomical structures in this region.

The pronator quadratus fills the interosseous space between the radius and ulna (Figure 18 and 19). The caudal interosseous artery is located between these two bones. Small branches of the ulna course distally/ascend in this region, since the proximal branch, dorsal branch and distal branch of the ulnar nerve provide sensory input to the lateral side of the antebrachium and the lateral side of digit 5, respectively. This portion of the ulnar nerve is provided by spinal segments C8, T1 and T2. It is accompanied by the collateral ulnar artery and vein.

**Comments:**

Pinching the antebrachium just one or two cun proximal to this point is a good spot to assess the more caudal segments of the brachial plexus. Finding TH-5 first is the best way to find PC-6.

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**Figure 14:** Location of PC-6 in the groove between the flexor carpi radialis and superficial digital flexor muscle into the interosseous space.

**Figure 15:** The flexor carpi radialis travels through the carpal canal and inserts on the palmar side of the base of metacarpals II and III.

**Figure 16:** Location of the TH-5 acupuncture point 3 cun dorsal to the carpus on the cranialateral aspect of the forelimb in the interosseous space between the radius and ulna.
REFERENCES
3. Evans H, de Lahunta A. The muscular system. Miller’s Anatomy of the Dog, 4th Ed, Evans, de Lahunta (eds). St Louis, Mo: W.B. Saunders Company 2012:214-253; Figure 6-55 page 242;

Figure 17: Location of TH-5 on the lateral side of the thoracic limb, 3 cun proximal to the carpus in the interosseous space. The needle is placed between the lateral digital extensor and ulnaris lateralis muscle to penetrate the interosseous space.

Figure 18: Location of TH-5; sometimes the needle fits better between the lateral digital extensor and common digital extensor. This may be a function of rotation of the paw.

Figure 19: The needle penetrates into the interosseous space between the radius and ulna at the TH-5 acupuncture point. The tendons of the muscles are at the ends of the arrows.