

수궐음 심포경근의 해부학적 고찰

박 경 식¹

¹상지대학교 한의과대학 해부학교실

Study on the Anatomical Pericardium Meridian Muscle in Human

Kyoung-Sik Park¹

¹Dept. of Anatomy, College of Oriental Medicine, Sangji University

Abstract

Objectives : This study was carried to identify the component of *the Pericardium Meridian Muscle* in human.

Methods : The regional muscle group was divided into outer, middle, and inner layer. The inner part of body surface were opened widely to demonstrate muscles, nerve, blood vessels and to expose the inner structure of *the Pericardium Meridian Muscle* in the order of layers.

Results : We obtained the results as follows;

- *The Pericardium Meridian Muscle* composed of the muscles, nerves and blood vessels.
- In human anatomy, it is present the difference between terms (that is, nerves or blood vessels which control the muscle of *the Pericardium Meridian Muscle* and those which pass near by *the Pericardium Meridian Muscle*).
- The inner composition of *the Pericardium Meridian Muscle* in human is as follows ;

1) Muscle

P-1 : pectoralis major and minor muscles, intercostalis muscle(m.)

P-2 : space between biceps brachialis m. heads.

P-3 : tendon of biceps brachialis and brachialis m.

P-4 : space between flexor carpi radialis m. and palmaris longus m. tendon(tend.), flexor digitorum superficialis m., flexor digitorum profundus m.

P-5 : space between flexor carpi radialis m. tend. and palmaris longus m. tend., flexor digitorum superficialis m., flexor digitorum profundus m. tend.

P-6 : space between flexor carpi radialis m. tend. and palmaris longus m. tend., flexor digitorum profundus m. tend., pronator quadratus m.

H-7 : palmar carpal ligament, flexor retinaculum, radiad of flexor digitorum superficialis m. tend., ulnad of flexor pollicis longus tend. radiad of flexor digitorum profundus m. tend.

H-8 : palmar carpal ligament, space between flexor digitorum superficialis m. tends., adductor pollicis m., palmar interosseous m.

· 교신저자: 박경식, 강원도 원주시 우산동 660, 상지대학교 한의과대학
해부학교실, Tel. 033-730-0667, Fax. 033-730-0653,
E-mail : ksikpark@sangji.ac.kr

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H-9 : radiad of extensor tend. insertion.

2) Blood vessel

P-1 : lateral cutaneous branch of 4th. intercostal artery, pectoral br. of thoracoacromial art., 4th. intercostal artery(art.)

P-3 : intermediate basilic vein(v.), brachial art.

P-4 : intermediate antebrachial v., anterior interosseous art.

P-5 : intermediate antebrachial v., anterior interosseous art.

P-6 : intermediate antebrachial v., anterior interosseous art.

P-7 : intermediate antebrachial v., palmar carpal br. of radial art., anterior interosseous art.

P-8 : superficial palmar arterial arch, palmar metacarpal art.

P-9 : dorsal br. of palmar digital art.

3) Nerve

P-1 : lateral cutaneous branch of 4th. intercostal nerve, medial pectoral nerve, 4th. intercostal nerve(n.)

P-2 : lateral antebrachial cutaneous n.

P-3 : medial antebrachial cutaneous n., median n. musculocutaneous n.

P-4 : medial antebrachial cutaneous n., anterior interosseous n. median n.

P-5 : median n., anterior interosseous n.

P-6 : median n., anterior interosseous n.

P-7 : palmar br. of median n., median n., anterior interosseous n.

P-8 : palmar br. of median n., palmar digital br. of median n., br. of median n., deep br. of ulnar n.

P-9 : dorsal br. of palmar digital branch of median n.

Conclusions : This study shows some differences from already established study on *Meridian Muscle*.

Key words : *Meridian Muscle*, meridian point(P1~9), muscle, blood vessel, nerve

I. Introduction

The concept of *Meridian Muscle* shown in *Ling Shu (Miraculous Pivot)* of *HUANDI NEIJING* (A Bible in traditional chinese medicine for about two thousand years) is closely connected with *the Twelve Main Meridian*. *Main Meridian* or *Meridian Muscle* is a general term of muscular system distributed in circulation of the Twelve Main Meridian, classified into *3Yin (The Negative)*-*3Yang (The Positive)* of upper & low limb¹⁾ and composed of muscular tissue such as muscle (involving

tendon), fascia, ligament,²⁾ which *Chi* (Gie : life energy) in *the Twelve Main Meridian* is collected for or concluded or translated into.³⁾ *The Twelve Meridian Muscle* is distributed in the body surface of limb, trunk or head part, and in most case it's way is made in the opposite direction to the tip of limb.

The term of *Meridian Muscle* has a deep meaning in myology, arthrology, rehabilitation, and the other clinics. Since anatomical, constituent elements of individual *Meridian Muscle* are wrongly known to the academic world of oriental medicine, it bring about a

mistaken clinical application or a wrong diagnosis.

This study was carried out in order to investigate correct elements of *the Twelve Meridian Muscle* and to support the meridianology or oriental clinics .

At this time we report *the Pericardium Meridian Muscle* in human following *the Lung Meridian Muscle*,⁴⁾ *the Large Intestine Meridian Muscle*,⁵⁾ *the Spleen Meridian Muscle*,⁶⁾ *the Small Intestine Meridian Muscle*,⁷⁾ and *the Heart Meridian Muscle*⁸⁾.

II. Materials and methods

1. Reagents and injection

1) The preparation of a preservative

Phenol weighing one kilogram was dissolved in one litre methylalcohol (The 1st solution).

The 500 ml of glycerin was dissolved in 2 l of methylalcohol and thereafter the additional 500 ml of glycerin was dissolved in this solution (The 2nd solution). The 1st and 2nd solution were well mixed, and made warm (30min, 20°C). The 1 l of methylalcohol was added to this mixed solution, and was stirred for 10minutes. For the last time 1.5 l of formalin was added to this mixed solution.

2) Injection

The sheath of femoral artery & vein were exposed by vertical incision at the medial third of inguinal ligament, and femoral artery is carefully separated from femoral vein.

A preservative was injected into femoral artery at the speed of 150 ml per minute.

After 6 l of preservative was injected, A needle-inserted part was ligated, and subsequently injector needle was inserted downwards for the preservation of the leg.

2. Embalment of cadaver and experimental procedure

- 1) Cadaver was pending in the embalmment system for 40 hrs at 40°C.
- 2) Cadaver was exposed for 1hr at the normal temperature, and after that, was kept in refrigerated storage (3°C, 30% humidity).
- 3) *The Pericardium Meridian Muscle* was labelled by latex at the surface of cadaver, subsequently photographed.
- 4) Pore was made by drill in the vertical direction at each meridian point.
- 5) Skin and superficial fascia were stripped off in the order and thereafter were labelled by latex at the exposed deep fascia surface, once more was photographed.
- 6) Deep fascia was also removed.
- 7) Subsequently muscle, tendon, nerve, blood vessels were investigated, photographed, and being divided into three layers (outer, middle, and inner layer).

III. Results

The Pericardium Meridian Muscle was

Figure 1 shows meridian points in cadaver skin.

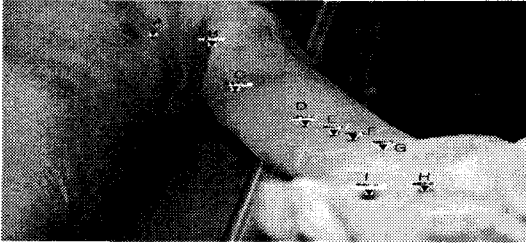


Figure 1. Photograph shows meridian points (A:Ch'önji, B:Ch'önch'ön, C:Kokt'aek, D:Kügmun, E:Kansa, F:Naegwan, G:Taentüng, H:Nogung, I:Chungch'ung, P1~9)

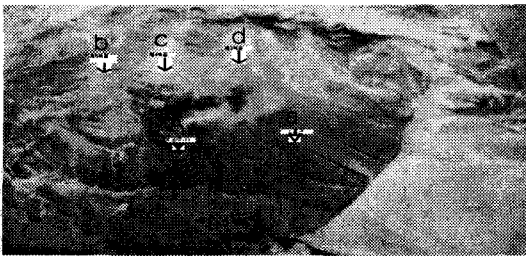


Figure 2. Photograph shows meridian points (Ch'önji:P1) and muscles (a:pectoralis minor muscle, b:5th.intercostalis muscle, c:4th.intercostalis muscle, d:3th.intercostalis muscle)

marked at the surface of cadaver, and investigated. And also constituent elements was divided into three layers (outer, middle, inner layer)and identified as follows

1) A schema of *the Pericardium Meridian Muscle* (Figure 1, and referred to Figure 8)

2) Muscle, blood vessels, nerve constituting *the Pericardium Meridian Muscle*.

1. Ch'önji (P1)

As shown in figure 2, muscle group at outer layer is composed of pectoralis major muscle, that at middle layer is composed of pectoralis minor muscle, at deep layer intercos-

talis muscle.

Lateral cutaneous branch of 4th. intercostal artery belongs to blood vessel at outer layer, and there is pectoral br. of thoracoacromial artery at middle layer, 4th. intercostal artery, at inner layer.

In case of nerves there are lateral cutaneous branch of 4th. intercostal nerve, medial pectoral nerve in middle layer, and 4th. intercostal nerve at inner layer.

2. Ch'önch'ön (P2)

Muscle related to this meridian muscle is biceps brachialis muscle at outer layer, because Ch'önch'ön corresponds to space between brachii biceps muscle heads (Figure 3).

Nerve are composed of lateral antebrachial cutaneous nerve.

3. Kokt'aek (P3)

As gathering from this study, muscle group constituting this meridian muscle are biceps brachialis muscle tendon at outer layer and brachialis muscle at inner layer (Figure 3, 4), as for blood vessel, intermediate basilic vein and brachial artery at outer layer.

Medial antebrachial cutaneous nerve and median nerve lie at outer layer, musculocutaneous nerve at middle layer (Figure 3).

4. Kügmun (P4)

Constituent elements of this meridian muscle are space between flexor carpi radialis muscle and palmaris longus muscle tendon

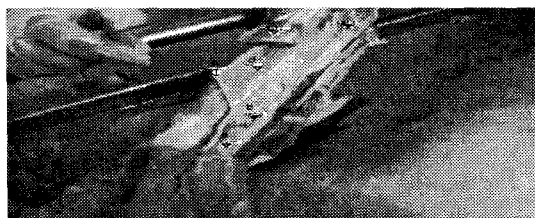


Figure 3. Photograph in middle layer level shows meridian points (b:Ch'ōnch'ōn, C:Kokt'aek), muscles (a:coracoid m., d:brachialis m., e:biceps brachialis m.), and musculocutaneous nerve (c)

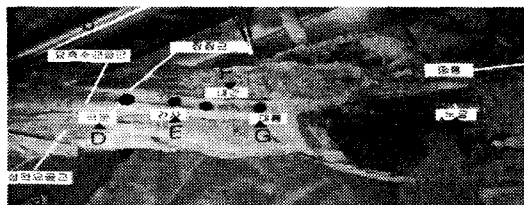


Figure 5. Photograph at outer muscular level shows meridian points (D:Kūgmun, E:Kansa, F:Naegwan, G:Taenūng, H:Nogung) and muscles (a:brachioradialis m., b:flexor carpi radialis m., c:palmaris longus m. tend.)

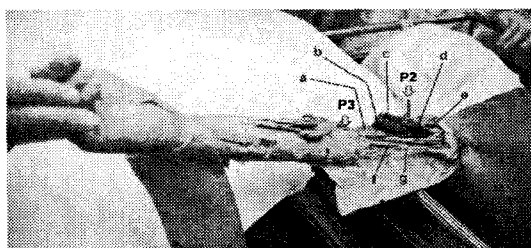


Figure 4. Photograph in inner layer level shows meridian points (P2:Ch'ōnch'ōn, P3:Kokt'aek), muscles (a:biceps brachialis m. insertion, b:brachialis m., c:biceps brachialis m. short head), vessels (e,f:brachial v.a), and nerves (d:musculocutaneous n., g:median n.)



Figure 6. Photograph at middle muscular level shows meridian points (D:Kūgmun, E:Kansa, F:Naegwan, G:Taenūng), muscles (a:flexor digitorum superficialis m., b:flexor pollicis longus m.) and median nerve.

(Figure 5), intermediate antebrachial vein, medial antebrachial cutaneous nerve at outer layer, flexor digitorum superficialis muscle at middle layer (Figure 6), and flexor digitorum profundus muscle, anterior interosseous artery, anterior interosseous nerve, median nerve at inner layer (Figure 7).

5. Kansa (P5)

Muscular elements of this meridian muscle are space between flexor carpi radialis muscle tendon and palmaris longus muscle tendon at outer layer (Figure 5), flexor digitorum superficialis muscle at middle layer (Figure 6),

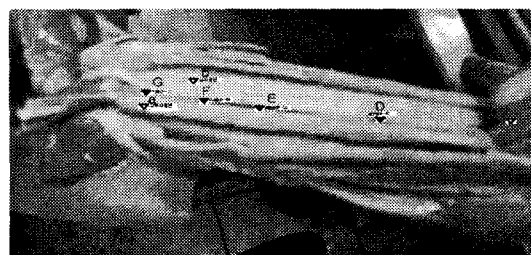


Figure 7. Photograph at inner muscular level shows meridian points (D:Kūgmun, E:Kansa, F:Naegwan, G:Taenūng), muscles (a:flexor pollicis longus m. tend., flexor digitorum profundus m. tend., c:flexor digitorum superficialis m.)

flexor digitorum profundus muscle tendon at inner layer (Figure 7).

There are intermediate antebrachial vein at outer layer, anterior interosseous artery at

middle layer.

Median nerve exist at outer layer, and also anterior interosseous nerve at middle layer.

6. Naegwan (P6)

Constituent elements of this meridian muscle are similar to above-mentioned Kūngmun, Kansa. Space between flexor carpi radialis muscle tendon and palmaris longus muscle tendon constitute muscle group at outer layer (Figure 5), flexor digitorum profundus muscle tendon at middle layer, and pronator quadratus muscle at inner layer (Figure 7).

Outer layer are composed of intermediate antebrachial vein, median nerve, and inner layer, anterior interosseous artery & anterior interosseous nerve.

7. Taenūng (P7)

Outer layer (Figure 5)are composed of palmar carpal ligament & flexor retinaculum, intermediate antebrachial vein, palmar br. of median nerve and middle layer, composed of space between flexor carpi radialis muscle tendon and palmaris longus muscle tendon, radiad of flexor digitorum superficialis muscle tendon (Figure 5, 6), median nerve. There are ulnad of flexor pollicis longus muscle tendon, radiad of flexor digitorum profundus muscle tendon, palmar carpal br. of radial artery, anterior interosseous artery, anterior interosseous nerve at inner layer (Figure 7).

8. Nogung (P8)

At outer layer (Figure 5) palmar carpal

ligament (palmar aponeurosis), space between flexor digitorum superficialis muscle tendons, lumbrical muscle, superficial palmar arterial arch palmar br. of median n., palmar digital br. of median nerve exist. There are adductor pollicis muscle, br. of median nerve at middle layer (Figure 6), palmar interosseous muscle, palmar metacarpal artery, deep br. of ulnar n. at inner layer.

9. Chungch'ung (P9)

Constituent elements of outer layer are composed of radiad of extensor tend. insertion, dorsal br. of palmar digital artery, dorsal br. of palmar digital br. of median nerve (Refer to Figure 1).

IV. Discussion

The Pericardium Meridian Muscle originates from inner chest, goes down piercing diaphragm, subsequently is connected with triple energizer meridian. Main branch reaches axillary region, especially *Ch'onch'on* meridian point. That passes by anterior & medial side of brachium and lies at space between *the Lung Meridian Muscle* and *the Heart Meridian Muscle*, and subsequently arrives at *Kokt'aek* situated at anterior condyle of humerus, passes by anterior of antebrachium, shortly it goes through anterior side of wrist joint, after that anterior surface of palm, finally reaches *Chungch'ung* at the tip of middle finger.¹⁾ (Figure 8)

Meridian Muscle in oriental medicine

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