

원저

The Study of Depth of Local Acupuncture Points for Rotator Cuff Disorders

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국문초록

회전근개 질환에 사용되는 근위혈들의 자침 심도에 대한 연구

백승태 · 이승덕 · 변혁 · 김우영 · 정용래 · 이아람 · 김갑성

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목적 : 견관절 질환의 대부분의 원인을 차지하는 극상근건과 견봉하 점액낭 질환 침치료에 있어서 근위취혈의 관점으로 접근했을 때 손상된 조직인 극상근건과 견봉하 점액낭에 자입하는 것이 중요하다. 어떻게 이 조직에 접근할 것인가에 대해 X선 촬영을 통해 확인해 보고자 한다.

방법 : 4명의 지원자를 받아서 肩髃穴(LI 15), 巨骨穴(LI 16), 臑上穴(UE 57)의 혈자리에 투시촬영을 이용해 자침을 하였다. 투시촬영으로 원하는 조직에 침이 자입되었음을 확인한 후 X선 촬영을 하여 확인하는 방법으로 진행하였다.

결과 : 肩髃穴(LI 15) 刺針時 5cm의 깊이로 直刺할 때 원하는 조직인 극상근건과 견봉하 점액낭에 도달하는 것을 확인할 수 있었다. 巨骨穴(LI 16) 刺針時에는 5cm의 깊이로 臑上穴 부위로 下斜刺 했을 때, 臑上穴(UE 57) 刺針時에는 5cm의 깊이로 巨骨穴 부위로 上斜刺 했을 때 극상근건과 견봉하 점액낭에 도달함을 확인할 수 있었다.

결론 : 극상근건과 견봉하 점액낭 질환을 근위취혈의 관점으로 치료하고자 할 때 肩髃穴, 巨骨穴, 臑上穴에 정확한 깊이와 방향으로 자입을 해야 원하는 조직인 극상근건과 견봉하 점액낭에 자입할 수 있음을 확인할 수 있었다.

핵심 단어 : 근위취혈, 극상근건, 견봉하 점액낭

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I. Introduction

Shoulder pain is one of the most common of all peripheral joint disorders with the point incidence amongst the general population said to be as high as 20%¹⁾.

Rotator cuff disorders are by far the most common source of shoulder problems, ranging from mild strain causing impingement type symptoms, to massive tears with total absence of the cuff and severe loss of function²⁾.

Rotator cuff disorders include impingement, subacromial bursitis, tendinosis, painful arc syndrome, partial or full thickness and massive tear of the rotator cuff, long head of biceps tendinosis or rupture and calcific tendinitis³⁾.

Effective treatment of rotator cuff disorders, or of any soft tissue injury requires an alteration in tissue structure to restore normal function to the affected soft tissue areas. Acupuncture is very successful at treating this type of injury.⁴⁾

An acupuncture prescription consists of a selection and combination of points that are tailored to the individual. There are three methods of point selection: local, distal, and symptomatic.

Local points refer to the vicinity of the distress. They are used most often to treat superficial or localized conditions. For example, acupuncture point B-2 (zan-zhu) in the vicinity of the eye may be chosen for eye diseases. Distal or remote points refer to a site which is distant from the location of the disorder, acupuncture point GB-37 (guan ming) on the leg is also used to treat eye disorders. Distal acupoints are usually located on the limbs. Symptomatic points are acupoints based on function. For example, LI-4 (hegu) on the hand is used to reduce fever or heat.

We will discuss mainly a local point selection. If healing of injured tissues is the main concern of the therapist then eliciting local effects of acupuncture could be one aim of therapy. Local effects may be maximized by using local acupuncture

points, or simply by putting the needle directly into the damaged tissue. In addition, any points chosen for local effect could induce segmental effects⁵⁾. Therefore the depth and the direction of the acupuncture needles are very important to touching the tissue in a local point selection.

The frequent diagnoses for patients with shoulder pain include tendinitis/bursitis, osteoarthritis and rotator cuff tears⁶⁾. The cause of shoulder pain is most often injury to either the supraspinatus or bursa of the shoulder joint⁷⁾. Thus the supraspinatus tendon and subacromial bursa are very important tissue to treat by acupuncture.

So from the local point selection angle, it is important that the acupuncture needle touch supraspinatus tendon and subacromial bursa for treatments of shoulder pain

The purpose of the present study is to determine an appropriate point, depth and direction of acupuncture at supraspinatus tendon and subacromial bursa with X-ray from a local point selection angle.

II. Methods

1. Participants

Participants in the study were volunteers from the College of Oriental Medicine at the Dongguk University. We explained the purpose, procedure, risks, and benefits of the study to participants. 4 students had agreed to participate in the study. The participants was informed though the process of informed consent that they may withdraw from the study at any time for any reason.

2. Methods

4 participants were inserted at Jianyu, Jugu and Naoshang in a standing position. We confirmed acupuncture needle's movement with fluoroscopy when acupuncture. Then they had X-ray with

AP view of the shoulder while standing. We used sterile, stainless steel filiform needles. The acupuncture needles are 60 mm long with a diameter of 0.35 mm (Hao type, needles for single use, Dongbang Acupuncture INC, Chungnam, Korea). Sterilization was required for all needles (filiform, plum-blossom, seven-star, subcutaneous, round-head subcutaneous), cups and other equipment used (storage trays, forceps, guide tubes for needles, cotton wool balls and sticks, etc.). All disposable needles were discarded immediately after use and placed in a special container. Each sterile filiform needle was used for puncturing once, and once only.

Jianyu(肩髃, LI 15) is located at the lateral side of the acromio-clavicular articulation in the hollow formed by the acromion when the arm is abducted.⁸⁾ When we inserted at Jianyu, the supraspinatus tendon sheath can usually be achieved with the forearm resting on the thigh. But if this is difficult, the elbow can be bent at a right angle, with the forearm placed behind the back. This fixes the arm in adduction and medial rotation, and the supraspinatus tendon is lying in the sagittal plane, emerging under the anterior edge of the acromion which is the site of acupuncture⁹⁾. We inserted the needle by 5cm length and perpendicular insertion of the needle at the point. Then needle touched to supraspinatus tendon.

III. Results

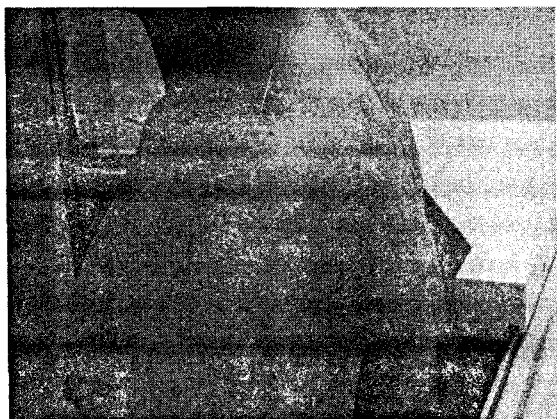


Fig. 1. Photo of Acupuncturing Appearance 1

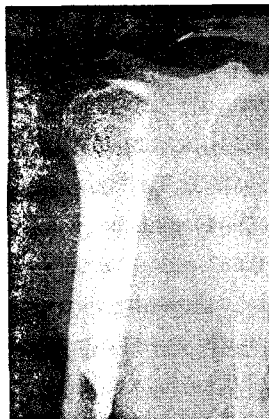


Fig. 2. Original X-ray 1

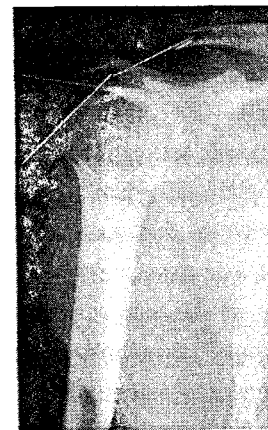


Fig. 3. Compiled X-ray 1

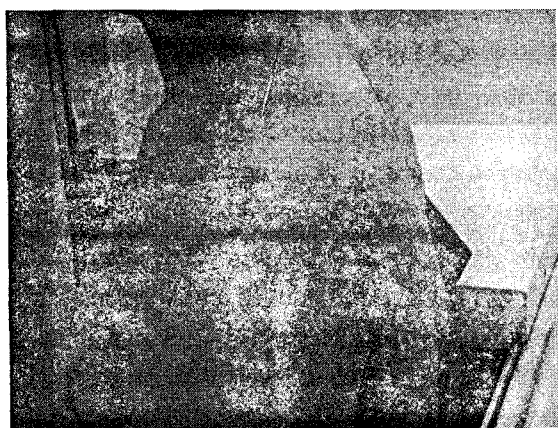


Fig. 4. Photo of Acupuncturing Appearance 2



Fig. 5. Original X-ray 2



Fig. 6. Compiled X-ray 2

Jugu(巨骨, LI 16) is located at the corner of the triangle of the acromio-clavicular joint⁸⁾. We inserted the needle by 5cm length and lateral oblique direction toward Naoshang at the point. Then needle touched to supraspinatus tendon.

Naoshang(肩髃, LI 15) located on the lateral surface of the upper arm, at the center of the deltoideus muscle¹⁰⁾. When We inserted at Naoshang, We palpated the distal, lateral edges of the acromion. And then We inserted the needle by 5cm length and superior oblique direction toward Jugu at 5cm inferior point to the lateral edge of the acromion. Then the needle touched to subacromial bursa through deltoid muscle.

IV. Discussion

An acupuncture prescription consists of a selection and combination of points that are tailored to the individual. There are three methods of point selection: local, distal, and symptomatic.

Distal points refer to a location far from the site of the pain, usually a point below the elbow or knee. The method is commonly used to treat diseases of internal organs.

Symptomatic points may consist of one or a combination of two or more points which have been proven over time to be very effective in the treatment of a particular disorder. The clinical basis for these treatment protocols are based purely on experience⁴⁾.

Local points refer to the vicinity of the pain. Thus, pain the head, neck forearm, low abdomen, knee, foot, etc. can be treated via points in the same locality. Thus the injury tissue is a local point. Local and distal point selections are based upon the distance of the points from the site of the diseases. There are two kinds of local acupuncture points: classical acupuncture points which are located close to the area of pain, and, points of sensitivity (not actual points) which are

referred to Ashi points which may also be chosen due to their responsive nature.

Ashi point refers to the acupuncture point located on the ground of the pressure pain point. The said point is identical in meaning with the pain-point in "Miraculous Pivot" and Yianying-xue designated by later generations.

We focus on the local point selection. The local point selection is based on the five techniques of needling at "on governing the needles" of 《Ling Shu》.

The five techniques of needling is depth theory of an acupuncture. At five techniques, the first is called one-half needling. For one-half needling, shallowly insert, and then quickly withdraw the needle without needling to injure the flesh. It is like removing fine hair and is used to treat the skin qi. The second is called the leopard's spots acupuncture. This affects the center of the channels, and is used to treat the blood of the major channels. The third is called gate needling. Gate needling is also called needling the deep spring, or delighted needling. The fourth is called adjacent valleys acupuncture. Needle is inserted to the division between the fleshes. The fifth is called transmitted needling. The depth of the insertion reaches the bones¹¹⁾.

Like this, the five techniques are related with the depth of acupuncture treatment. Gate needling and transmitted needling of five techniques of needling can used for treatment of disorder with tendon and bursa. This is a point of anatomical view. There are "Pain point is acupoint" in chapter 13 of 《Ling Shu》 The local point selection referred at chapter 7 of 《Huangdi Neijing · Suwen》 too. And There are contents like "Acupuncture should be inserted at injury tissue" Therefore it's very important that the needle touches to injured tissue.

Local acupuncture mechanisms are peripheral mechanism and spinal mechanism. Distant mechanisms is supraspinatus mechanism¹²⁾.

This results from an axon reflex, whereby sensory neuropeptides such as Substance P and

Calcitonin Gene Related Peptide (CGRP) are released from primary afferent nerve endings in peripheral mechanisms. Sensory neuropeptides produce local vasodilatation and modulate local immune responses¹³. In order to utilise the local effects of acupuncture, Lundeberg(1998)¹⁴ recommends needling close to the injured tissue and that it be performed with low intensity stimulation to encourage peripheral, rather than central neuropeptide release.

Spinal mechanisms include attenuation of nociceptive input in the dorsal horn of the spinal cord¹⁵, alterations in sympathetic outflow that are intensity dependant¹⁶, and changes in motor output¹⁷. It is proposed that spinal effects may occur immediately and have the potential to elicit strong analgesic effects. These effects may be obtained by needling the site of injury or any tissue innervated by the same spinal segment as the injured tissue according to Lundeberg (1998)¹⁴.

There are many descending inhibitory systems from the brain that acupuncture is thought to activate in supraspinal mechanisms. These include diffuse noxious inhibitory controls (DNIC), descending pain inhibitory pathways from the arcuate nucleus in the hypothalamus, neurohormonal responses and central control of autonomic nervous system from the arcuate nucleus¹⁸⁻¹⁹.

Appropriate points and stimulation parameters can be chosen in an effort to provide an optimum intervention. If healing of injured tissues is the main concern of the therapist then eliciting local effects of acupuncture could be one aim of therapy. Local effects may be maximized by using local acupuncture points, or simply by putting the needle directly into the damaged tissue. In addition, any points chosen for local effect could induce segmental effects. In acute pain, segmental effects may be desirable, as they could produce strong analgesia¹⁴.

The shoulder pain is a common complaint in general medical practice, impairing the quality of life and job performance²⁰. The shoulder pain often arises from tendons, muscles or bursa, and

less frequently has articular origin²¹. Estimated prevalence of shoulder disorders is subacromial bursitis & supraspinatus tendinitis 60%, adhesive shoulder capsulitis 12%, supraspinatus tendon tear or rupture 10%, acromioclavicular joint osteoarthritis 7%, bicipital tendinitis 4%, Other & unclear 7%³¹. Then 70~80% of the shoulder disorder is related with supraspinatus tendon and subacromial bursa²¹⁻²².

Acupuncture points of shoulder pain are Jianjing, Jianzhen, Jianyu, Jugu, Yuany in *Zhenjiu Dacheng* and *Zhenjiu Jiayi Jing* *Qianjin Yao Fang*. Among them Jianyu, Jugu are recorded frequency. These points are near to supraspinatus tendon, subacromial bursa. 70~80% of the shoulder disorder is related with supraspinatus tendon and subacromial bursa. So We think that treatment effectiveness of these points are associated with supraspinatus tendon and subacromial bursa.

And Naoshang is new point of upper extremity. We often used Naoshang point for treatment of shoulder pain and We think Naoshang point is near to supraspinatus tendon and subacromial bursa. Then We carry out this study with Jianyu, Jugu and Naoshang.

We inserted the needle by 5cm length and perpendicular insertion of the needle at Jianyu. Then the needle touched to supraspinatus tendon.

We inserted the needle by 5cm length and lateral oblique direction at Jugu. Then the needle touched to supraspinatus tendon. Beals et al revealed that the mid portion of the bursa in the coronal plane was at the anterolateral corner of the acromion²³. Beals et al described a similar finding in their anatomic study, in which they reported that 3 of 11 specimens had bursa that did not extend medial to the acromioclavicular joint. This finding may have implications in the selected approach, as anterolateral injection may place material too far medially²³.

When We inserted at Naoshang, We palpated the distal, lateral edges of the acromion. And then We inserted the needle by 5cm length and superior oblique direction at 5cm inferior point to the lateral edge of the acromion. Then the needle

touched to subacromial bursa through deltoid muscle and subdeltoid bursa.

We confirmed acupuncture needle was inserted at other tissue when acupunctures needle were applied with other point or other depth or other direction.

V. Conclusion

The acupuncture needle should touch supraspinatus tendon and subacromial bursa for treatment of most shoulder pain from a local point acupuncture angle. The best way of touching supraspinatus tendon and subacromial bursa is to acupuncture at Jianyu, Jugu, Naoshang. In a local point selection angle, the acupuncture should be applied with an appropriate point, depth and direction at Jianyu, Jugu and Naoshang.

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