

통증 및 근골격재활

게시일시 및 장소 : 10 월 18 일(금) 08:30-12:20 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 10:00-10:45 Room G(3F)

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Ultrasonographic description of the the posterior antebrachial cutaneous nerve in healthy volunteer

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Introduction

The posterior antebrachial cutaneous nerve (PACN) is one of the cutaneous branches of the radial nerve, which courses posterior to the lateral intermuscular septum and deep to the lateral head of triceps brachii. It also provides sensory innervation to the posterolateral forearm. Surgical intervention and needle injury around the distal upper arm may cause injury of the PACN leading to lateral epicondylar pain. Some cadaveric studies available demonstrated the anatomy of the PACN. However, there is no sonographic anatomic study of the PACN in the healthy volunteer. The aim of this study was to describe the PACN in the distal upper arm and suggest the risk zone susceptible to injury of the PACN in the normal subjects.

Material and methods

Twenty healthy volunteers over 19 years old were recruited in the study. Exclusion criteria included a history of cervical radiculopathy, any disease which causes peripheral neuropathy, any trauma around the upper extremity and family history of hereditary neuropathy. From the mid-level of the upper arm of the subjects, the PACN was scanned proximal to distal. We used the term called epicondylar line connecting the lateral epicondyle and the medial epicondyle. We have used the line to quantify the positional relationship of the PACN (Fig1). We have identified the location (A) where the radial nerve and the PACN are separated, the location (B) where the anterior (AD) and posterior division (PD) of the PACN are separated, and the location (C) where the PACN posterior division is divided by the epicondylar branch (Epi) and the anconeus branch (Anc). The distances from the epicondylar line were measured at A, B and C positions. The cross section area of each nerve and the depth from the nerves to the skin were measured at the level A,B,C.

Result

The mean distances from the epicondylar line to A, B, C were $10.01\pm 0.82\text{cm}$, $7.46\pm 0.98\text{cm}$, $4.02\pm 1.16\text{cm}$, respectively. The mean depths to the skin at the level A, B, C were $1.00\pm 0.19\text{cm}$, $0.72\pm 0.19\text{cm}$, $0.51\pm 0.12\text{cm}$, respectively. In all subjects, we identified the PACN and its major branches (AD, PD, Epi and Anc) (Fig2). We also confirmed that the

PACN runs deeper behind the lateral intermuscular septum and lateral head of the triceps brachii. The size of the nerves and depth from the nerves to the skin at each level are shown in Table1.

Conclusion

This study was the first study to confirm the PACN using ultrasonography in normal subjects. The precise location of the nerve may contribute to reducing the risk of nerve injuries in invasive procedures such as injection or surgery around the upper arm.

Table1. Cross section area of the each nerve and depth from the nerves to the skin at the level A, B, C

A	RN(mm ²)	PACN(mm ²)	Depth(cm)
	8.54±3.57	6.16±2.57	1.00±0.19
B	PACN-AD(mm ²)	PACN-PD(mm ²)	Depth(cm)
	3.16±1.30	2.95±1.13	0.72±0.19
C	PACN-Epi(mm ²)	PACN-Anc(mm ²)	Depth(cm)
	1.95±0.86	1.90±0.86	0.51±0.12

RN : Radial nerve, PACN : Posterior antebrachial cutaneous nerve, PACN-AD : anterior division of posterior antebrachial cutaneous nerve, PACN-PD : posterior division of posterior antebrachial cutaneous nerve, PACN-Epi : epicondylar branch of posterior antebrachial cutaneous nerve, PACN-Anc : Anconeus branch of posterior antebrachial cutaneous nerve

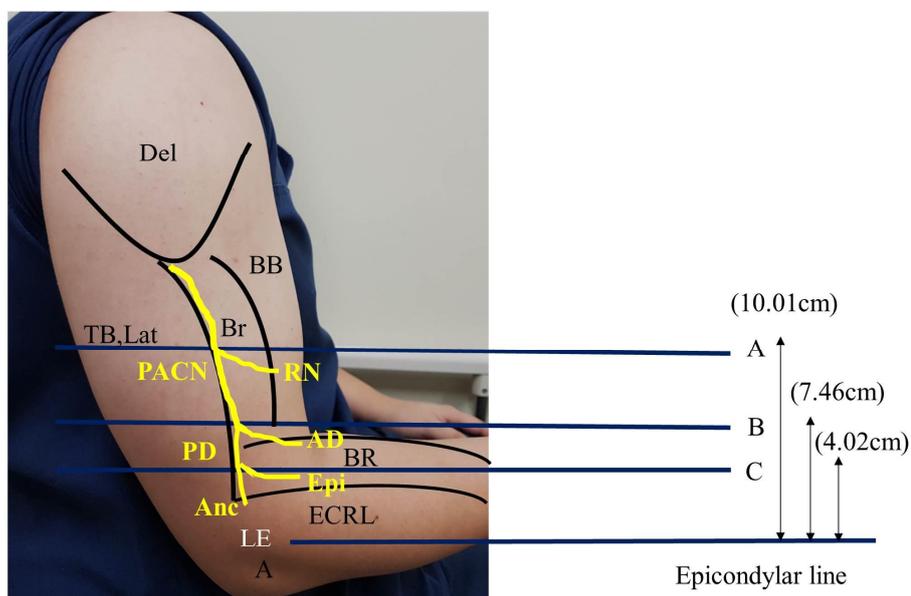


Fig1. Diagram of the posterolateral arm representing the course of the posterior antebrachial cutaneous nerve (PACN)

Del : Deltoid, TB,Lat : Lateral head of Triceps brachii, BB : Biceps brachii, Br : Brachialis, BR : Brachioradialis, ECRL : Extensor carpi radialis, A : Anconeus, LE : Lateral epicondyle, RN : Radial nerve, PACN : Posterior antebrachial cutaneous nerve, AD : Anterior division of posterior antebrachial cutaneous nerve, PD : Posterior division of posterior antebrachial cutaneous nerve, Epi : Epicondylar branch of posterior antebrachial cutaneous nerve, Anc : Anconeus branch of posterior antebrachial cutaneous nerve

Fig 1. Diagram of the posterolateral upper arm representing the course of the posterior antebrachial cutaneous nerve (PACN)

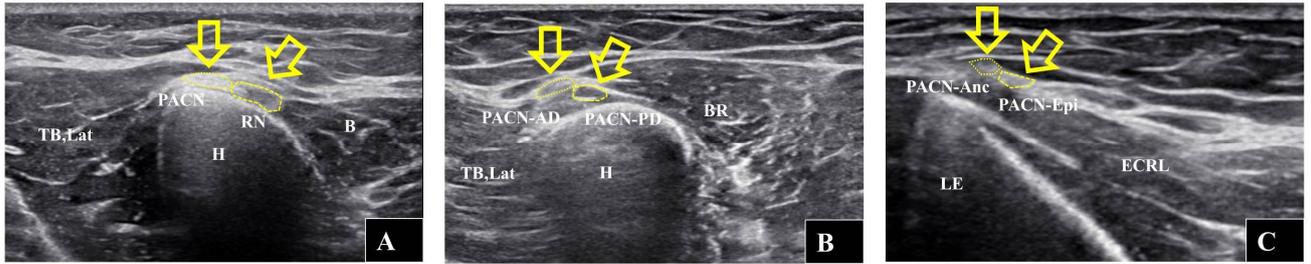


Fig2. Sonographic anatomic relationship of each nerve to the surrounding muscles at the level A, B, C

A. PACN : posterior antebrachial cutaneous nerve, RN : radial nerve, B : Brachialis, TB,Lat : Lateral head of triceps brachii, H : humerus

B. PACN-AD : anterior division of posterior antebrachial cutaneous nerve, PACN-PD : posterior division of posterior antebrachial cutaneous nerve, BR : Brachioradialis, TB,Lat : Lateral head of triceps brachii, H : humerus

C. PACN-Epi : epicondylar branch of posterior antebrachial cutaneous nerve, PACN-Anc : Anconeus branch of posterior antebrachial cutaneous nerve, ECRL : Extensor carpi radialis longus, LE : Lateral epicondyle

Fig 2. Sonographic anatomic relationship of each nerve to the surrounding muscles at the level A, B, C