

통증 및 근골격재활

발표일시 및 장소 : 10 월 27 일(토) 14:50-15:00 Room B(5F)

OP1-3-6

The safety zone of procedure in the sternocleidomastoid muscle

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Introduction

In clinical practice, dysfunction of the sternocleidomastoid (SCM) muscle causes myofascial syndrome, torticollis and cervical dystonia. The treatments have used for the dysfunction of the SCM muscle include steroid plus lidocaine and alcohol and botulinum toxin injections. The greater auricular nerve (GAN) provides sensory information on the superficial area of the outer ear lobe. Spinal accessory nerve (SAN) innervates the sternocleidomastoid and trapezius muscles. Transverse cervical nerve (TCN) provides sensory information on the skin over the anterior cervical triangle. Common feature of the greater auricular nerve (GAN), spinal accessory nerve (SAN) and transverse cervical nerve (TCN) can be injured occur during procedure in the SCM because they are superficial or penetrate to the SCM muscle. The aim of this study was to demonstrate that course of GAN, SAN, TCN mapped in healthy volunteers and relation of surface landmark using ultrasound. If this is achievable, it might be possible to reduce the risk during procedure in SCM muscle.

Material and Methods

The of the neck was scanned in 20 healthy volunteers (6 females, mean age 31 [25–36] y) by a qualified sonographer using the HD15 Ultrasound System (Philips, Bothell, WA, USA) and a 7-12 MHz linear array transducer. After recording characteristics, participants were scanned bilaterally in a standardized supine position with head turned 45° to the contralateral side. The following features of the GAN, SAN and TCN were recorded bilaterally (1) The distance between mastoid process and sternoclavicular notch (= reference line) (2) The cross sectional area and depth of the GAN, SAN and TCN at the reference line (3) The cross sectional area and depth of the GAN, SAN and TCN at the anterior, posterior border of SCM

Results

Characteristics of participants were shown in Table 1. The ultrasonographic findings of GAN, SAN and TCN were shown in Table 2. The GAN mean proportion was 21% [range, 10-31] at the level of reference line and 29% [range, 19-36] at the level of the posterior border of the SCM. The SAN mean proportion was 28% [range, 25-34] at the level of reference line and 36% [34-39]. The TCN mean proportion was 47% [range, 46-52] at the anterior border of the SCM, 51% [range, 46-53] at the level of reference line and

52[range, 49-55] at the posterior border of the SCM. The anatomical correlation of the three nerves is shown in the figure. (Figure 1).

Conclusion

The cervical nerves (GAN, SAN, TCN) around the SCM muscle are clearly observed at point of posterior border of SCM and reference line, but are not visible on the anterior border of SCM. The knowledge of the nerve's precise location and relation of surface landmark around the SCM muscle may have useful clinical applications considering invasive procedure. According to our study, it is recommended to perform the procedure in lower half portion of SCM muscle.

Table 1 Baseline characteristics of the study participants

| Variables | Mean ± standard deviation [range] |
|-------------------------------|-----------------------------------|
| <i>n</i> | 20 |
| Mean age (years) | 31.3±2.5 [25-36] |
| Mean height (m) | 1.72±0.07 [1.58-1.83] |
| Mean weight (kg) | 69.7±8.8 [54-83] |
| Mean BMI (kg/m ²) | 23.3±1.9 [18-26] |
| Reference line (cm) | 15.6±2.3 [13-18] |

* Reference line means the distance between mastoid process and sternoclavicular notch

Table 2 Ultrasonographic characteristics of the study participants

| Nerves | Anterior border of SCM | Reference line | Posterior border of SCM |
|----------------------------------|------------------------|----------------|-------------------------|
| Greater auricular nerve | | | |
| CSA (mm ²) | Non visible | 0.5±0.02 | 0.6±0.05 |
| Depth (cm) | Non visible | 0.28±0.12 | 0.26±0.04 |
| Proportion (% Mean[range]) | Non visible | 21[10-31] | 29 [19-36] |
| Spinal accessory nerve | | | |
| CSA (mm ²) | Non visible | 0.3±0.02 | 0.7±0.07 |
| Depth (cm) | Non visible | 0.78±0.35 | 0.57±0.05 |
| Proportion (% Mean[range]) | Non visible | 28[25-34] | 36 [34-39] |
| Transverse cervical nerve | | | |
| CSA (mm ²) | 0.4±0.21 | 0.3±0.15 | 0.3±0.07 |
| Depth (cm) | 0.29±0.12 | 0.29±0.08 | 0.31±0.02 |
| Proportion (% Mean[range]) | 47[43-52] | 51[46-53] | 52[49-55] |

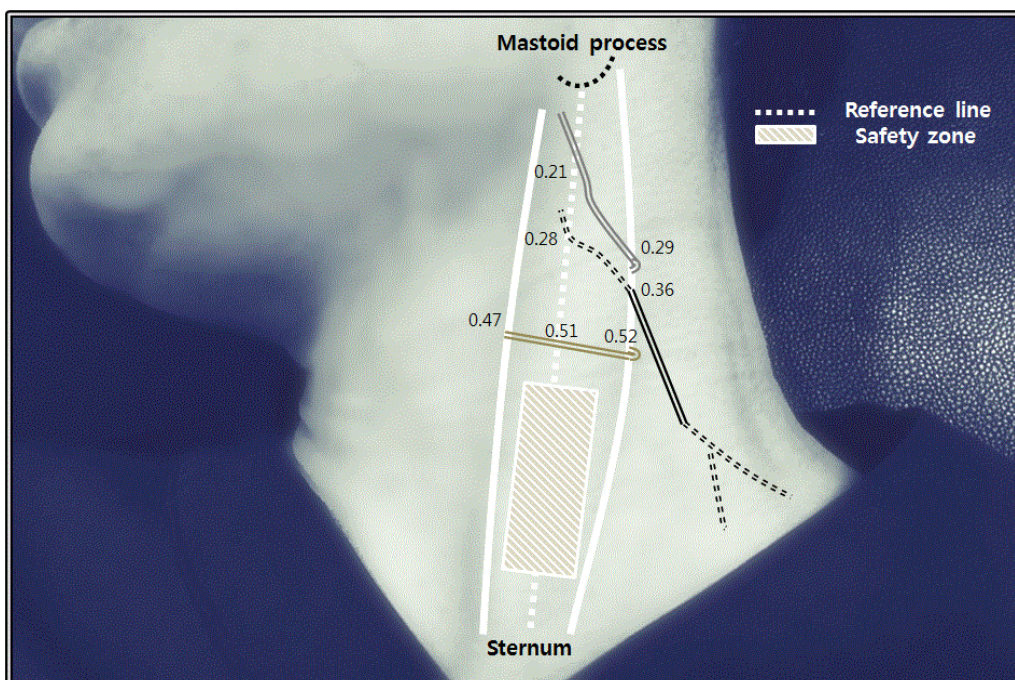


Figure 1 The anatomical correlation of the greater auricular nerve, spinal accessory nerve and transverse cervical nerve