신경근육재활 및 전기진단

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)

P 1-62

Ultrasound-Guided Injection of the Sternocleidomastoid Muscle: A Cadaveric Study

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Background and Aims

Ultrasound (US)-guided botulinum toxin injection is a commonly performed procedure for reducing pain and improving quality of life in patients with cervical dystonia. Sternocleidomastoid (SCM) is usually targeted, as sustained contraction of the muscle play a key role in abnormal rotational posture. To verify the safety of US-guided injection and suggest a guarded technique, (1) baseline ultrasonographic features of SCM were measured, and (2) dye dispersion patterns according to different solution volumes and injection sites were analyzed.

Methods

36 SCM muscles of 18 embalmed cadavers (11 male and 7 female) with a mean age ± SD of 79.2 ± 10.7 years were examined. One rehabilitation medicine physician evaluated baseline ultrasonographic parameters of SCM, cross-sectional area (CSA) and muscle thickness, at 3 quartile points. The physician also measured total SCM length with a tapeline. Other experienced physician injected methylene blue solution at the three points of SCM (12 muscles per each point) with two different dye volumes depending on the side (3cc on the right and 5cc on the left) under US-guidance. One anatomist blinded to the injection point and solution volume dissected the cadavers to identify dyed structures, then the longitudinal lengths (LL) of dye dispersion along the muscles were measured. The dispersion ratio (DR) was defined as the longitudinal length of dye dispersion divided by total SCM length.

Results

The thickness of upper, middle, and lower quartile SCM were 5.4 ± 1.2, 6.6 ± 2.0, and 5.5 ± 1.9 mm, respectively. The CSA of the quartile points were 1.1 ± 0.3, 1.4 ± 0.6, 1.1 ± 0.53 cm^2, respectively. All injections were successful except in one case of 3.5mm-thickness SCM that dye reached the omohyoid muscle, jugular vein, and common carotid artery. The mean LL of dye dispersion was significantly different between 3cc and 5cc groups: 6.2 ± 2.6

cm (range 2-12) versus 11 ± 2.1 cm (range 7.5-15), respectively. The mean DR was also significantly different between the two groups: 0.35 ± 0.13 (range 0.11-0.6) versus 0.64 ± 0.12 (range 0.46-0.84), respectively. No statistically significant differences in LL and DR were found between the three groups of distinctive injection sites.

Conclusions

US-guided injection into the SCM is considered as a safe procedure. The middle point of SCM is regarded as a proper injection point with respect to the safety issue since the thickness and CSA was the largest. However, caution is required as there is a risk of needle advancement beyond the target in case when the SCM muscle is thin. When it comes to the volume of solution, 5cc-injections dispersed more extensively than 3cc-injections. Clinicians could expect broader dispersion with 5cc-injections, while 3cc-injections could be intended for focal effects.