

Efficacy of Using Local Anesthesia Before Collagenase Injection in Reducing Overall Pain Experience in Patients Treated for Dupuytren Contracture: A Quasi-Randomized Study

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15.1 Hypothesis

Collagenase injection is increasingly used as a nonsurgical treatment for patients with Dupuytren contracture (Atroshi et al. 2014). In the clinical trial by Hurst et al. (2009) collagenase was injected into the cords without prior local anesthesia to avoid a potential confounding factor. In our clinical practice, we observed, however, that many patients seemed to experience substantial pain during the collagenase injection. The hypothesis of our study was that injecting a local anesthetic before collagenase injection can reduce the patients' overall pain experience during treatment.

15.2 Methods

Consecutive patients with Dupuytren contracture scheduled for collagenase injection were assigned to one of two groups (by alternating scheduled clinics): one received local anesthesia, as a nerve block in the proximal palm, approximately 20 min before collagenase injection (LA group), and the other received the collagenase injection without anesthesia (no-LA group). The eligibility criteria for treatment were a total extension deficit

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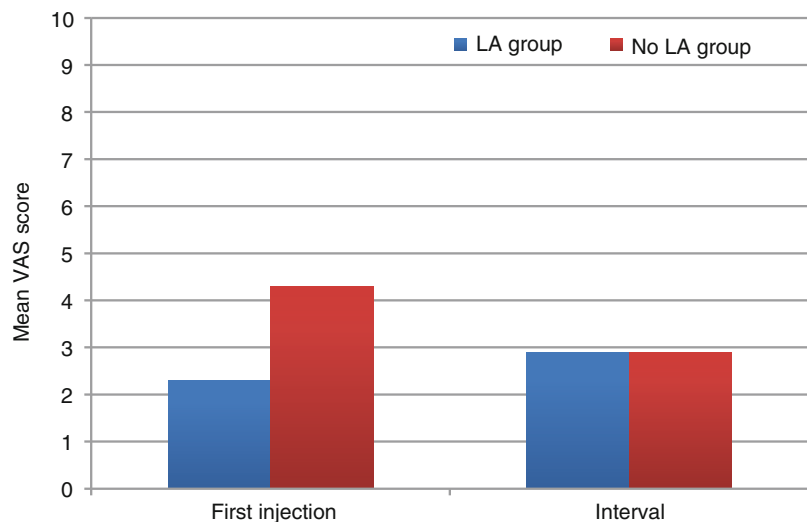
of $>20^\circ$ in the metacarpophalangeal joint and/or proximal interphalangeal joint in at least one finger and the presence of a palpable cord. An off-label modification of the standard collagenase injection technique was used (Atroshi et al. 2015). After reconstituting CCH with 0.39 ml of diluent, all content that could be withdrawn into the syringe (approximately 0.80 mg) was injected into multiple spots in the cord. The anesthetic used was 10 mg/ml mepivacaine, buffered by diluting each 20 ml with 5 ml 50 mg/ml sodium bicarbonate, in accordance with the guidelines established by the Department of Anesthesia, Skåne University Hospital (the amount of added bicarbonate is higher than that commonly advocated in the literature). Immediately after receiving local anesthesia and/or collagenase injection, the patients were asked by the nurse, independently of the treating surgeon, to rate the severity of the pain they experienced during the injection on a visual analog scale (VAS) ranging from 0 (no pain) to 10 (worst pain). When the patients returned to the outpatient clinic for finger extension 1 or 2 days after the collagenase injection, the nurse asked them to rate, on the same VAS scale, the severity of pain they had experienced

during the time since they received the injection. Previous studies assessing acute pain with the VAS scale have concluded that a difference of 1.3 is clinically significant (Gallagher et al. 2001). To be able to show a difference of this magnitude, we calculated a sample size of at least 50 patients per group (90% power, 5% significance, SD 2.0).

15.3 Results

The LA group included 83 patients (65 men), mean age 69 (SD 9) years, and the no-LA group included 78 patients (65 men), mean age 70 (SD 8) years. The mean score for pain experienced during the first injection (buffered mepivacaine in the LA group and collagenase in the no-LA group) was 2.3 (SD 1.7) for the LA group and 4.3 (SD 2.5) for the no-LA group (Fig. 15.1); the age and sex-adjusted mean difference in pain score was -2.1 (95% confidence interval -2.7 to -1.5 , $p < 0.001$). In the LA group, the mean score for pain experienced during collagenase injection was 0.9 (SD 1.0). The mean score for pain experienced during the 1 or 2 days interval between

Fig. 15.1 Experienced pain during injection and interval. Mean visual analog scale (VAS) scores for pain experienced during the first injection (buffered mepivacaine in the local anesthesia [LA] group; collagenase in the no-LA group) and during the time period (1 or 2 days) from the injection to the finger extension procedure



injection and finger extension was similar in the two groups; 2.9 (SD 2.3) for the LA group and 2.9 (SD 1.9) for the no-LA group ($p=0.9$). No adverse events related to the local anesthesia occurred.

15.4 Summary

In patients with Dupuytren contracture treated with collagenase injection, administering local anesthesia before the collagenase injection significantly reduces the patients' pain experience at the time of injection. It does not however reduce the pain experienced during the time interval up to the finger extension procedure because the effect of mepivacaine has a relatively short duration that is not prolonged by the sodium bicarbonate.

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