

Ultrasound Guided Hydrodissection for Treatment of Carpal Tunnel Syndrome: A Randomized Control Trial

PURPOSE

Ultrasound guided hydrodissection has received much attention recently for its role in treatment of nerve entrapment syndromes. It uses ultrasound-guided fluid injection to separate nerves from surrounding structures with the aim to release soft tissue adhesions that cause entrapment and restore function to the nerve. However, due to lack of randomized comparative studies and with most researchers adding steroid to the injectate, it remains unclear if the hydrodissection mechanism truly causes improvement in clinical outcome or the results are due to anti-inflammatory action of steroids. This prospective, randomized control trial evaluates the effectiveness of true hydrodissection for treatment of carpal tunnel syndrome (CTS).

METHODS AND MATERIALS

After institutional ethical approval, ICMR trial registration and informed consent, 63 wrists with refractory CTS were enrolled. Preprocedure parameters assessed were Boston Carpal Tunnel Questionnaire (BCTQ) (symptom and functional), VAS scores and cross-sectional area (CSA) of median nerve on ultrasound. After randomization into three groups with single blinding; two groups underwent US guided hydrodissection, Group 1 with normal saline (NS) alone and group 2 with NS and steroid mixture. Using in-plane ulnar approach, 5-10ml injectate was injected both superior and inferior to the nerve till it was completely dissected. Group 3 received guided perineural corticosteroid injection (1ml) without hydrodissection. Clinical and ultrasound follow-up was done at 4, 12 and 24 weeks with relevant prepost and intergroup comparisons.

RESULTS

At 4 weeks, significant improvement in mean BCTQ score (SSS and FSS) and VAS score was seen in all three groups (BCTQ 61.9%, 85.7%, 100% in group 1, 2 and 3); though slightly lower in hydrodissection with NS group and highest in steroid group. At 12 and 24 weeks, both hydrodissection groups had further improvement (group1- 95.2%, group2-96%), while the steroid group (14.7%) (p value <0.0001) had recurrence of symptoms with increase in BCTQ and VAS scores. Reduction of median nerve CSA was more marked and similar in both hydrodissection groups than steroid group at all times (43% and 46% versus 11% at 12 weeks in group 1,2 &3) (p value<0.0001). No significant adverse effects were encountered.

CONCLUSIONS

US guided hydrodissection of median nerve with NS alone provided a significant and persistent clinical and morphological improvement in CTS. Addition of steroid to the injectate did not offer any significant benefit, indicating, thus, that the therapeutic effect was primarily due to hydrodissection.

CLINICAL RELEVANCE/APPLICATIONS

US guided hydrodissection has the potential to be a safe and effective treatment option in refractory CTS and can alleviate the need for surgery.