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Ultrasonographic changes after steroid injection in Carpal Tunnel Syndrome

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Background: Recently new ortho-biological techniques have been utilized in cartilage lesions with increasing frequency.

Purpose: To determine the sonographic changes after steroid injection in Carpal Tunnel Syndrome (CTS) and evaluate the diagnostic value of ultrasound in post-treatment follow up examination.

Materials and Methods: One hundred four wrists with idiopathic CTS and thirty-six wrists of normal control subjects were studied using high resolution ultrasound. Axial images of these wrists in the neutral position were obtained of the distal radius, pisiform, and hook of hamate. At each level, cross sectional area (CSA 1-3 mm^2), flatterning ratio (FR1-3) of the median nerve were measured. Bowing of the flexor retinaculum (palmar displacement, PD mm) and transverse sliding of median nerve (SD mm) during passive flexion and extension of the index finger were also measured. And 27 wrists with CTS after injection of prednisolone 40 mg were studied using high resolution ultrasound with same methods after 1 week, 4 weeks, 8 weeks. The sonographic changes after steroid injection were evaluated and repeated measure ANOVA was analyzed.

Results: 1) CSA at each level was significantly higher in patients than in controls ($p<0.0001$): CSA1 (9.39±2.62 vs 5.72±1.85), CSA2 (10.49±2.95 vs 6.60±2.01), CSA3 (9.99±2.64, vs 6.62±1.90). FR was significantly higher in patients than in controls only at FR 3(2.57±0.59 vs 2.29±0.50, $p=0.0001$). In addition, PD was also significantly higher in patients than in controls (3.38±0.74 vs 2.35±0.60, $p=0.0001$) and SD was significantly lower in patients than in controls (0.82±0.83 vs 1.66±1.22, $p<0.0001$). 2) Among 27 CTS after steroid injection, CSA at all levels was significantly lower than pre-treatment ($p<0.0001$) and CSA at 8weeks after steroid injection was most significantly decreased. PD after steroid injection was also significantly decreased at 8 weeks when compared to the pre-treatment (2.58±0.27 vs 3.24±0.63, $p=0.0005$), and SD after steroid injection was most significantly increased at 8 weeks (1.71±0.90 vs 0.74±0.64, $p=0.0001$).

Conclusion: Significant ultrasound findings after steroid injection in CTS were decreased swelling of median nerve, decreased bowing of the flexor retinaculum and increased mobility of median nerve during finger motion. Ultrasound is a useful method for diagnosis and follow up examination in CTS.