


Sonographic Evaluation of the Median Nerve following Steroid Injection for Carpal Tunnel Syndrome

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We have nothing to disclose related to this study

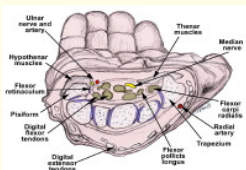


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BACKGROUND

- Intra-carpal, corticosteroid injection is an effective, short-term treatment method for idiopathic carpal tunnel syndrome



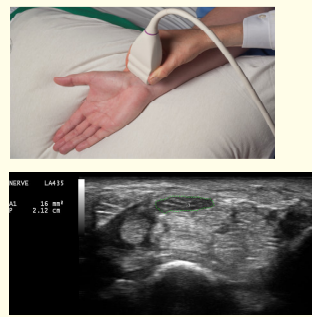
Marshall; Cochrane Review. 2007

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BACKGROUND

- Median nerve enlargement at the distal wrist crease level is a common, sonographic finding of idiopathic carpal tunnel syndrome



Wiesler; JHS (Am). 2006

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BACKGROUND

- The increase in median nerve size is partially attributed to the presence of subperineurial oedema
- Median nerve cross-sectional area at the wrist level decreases following surgical release for carpal tunnel syndrome

Rempel; JBJS Am. 1999

Smidt; Muscle Nerve. 2008

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PURPOSE

- The hypothesis that the cross-sectional area of the median nerve at the wrist level decreases following corticosteroid injection was tested
- Possible relationship between changes in nerve size and changes in symptoms following corticosteroid injection also was examined

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MATERIALS

- 19 participants, 10 bilateral cases, 29 wrists
- 12 males, 7 females
- Recruited from two different sites
- Inclusion Criteria
 - Idiopathic carpal tunnel syndrome
 - Baseline cross-sectional area > 12mm²
 - Single, intra-carpal steroid injection
- Exclusion Criteria
 - Previous surgery/injection

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METHODS

- Signed IRB approved informed consent form
- Evaluation Points
 - Baseline
 - 1 week
 - 1 month
 - 6 months
- 14 participants (22 wrists) followed for 6 months

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METHODS

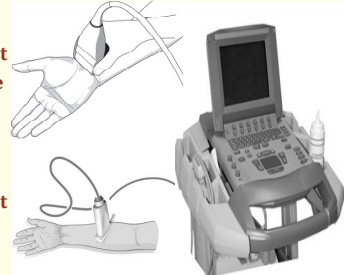
Ultrasound-Guided Injection Technique



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METHODS

- Outcome Measures
 - Median nerve cross-sectional area at the distal wrist crease level
 - Median nerve cross-sectional area at the mid-forearm level

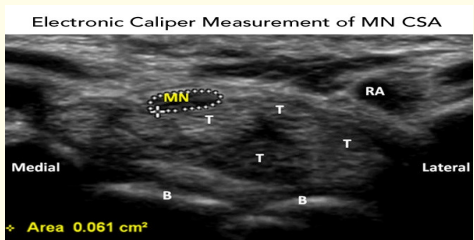


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METHODS

Carpal Tunnel Ultrasound Scan

Electronic Caliper Measurement of MN CSA

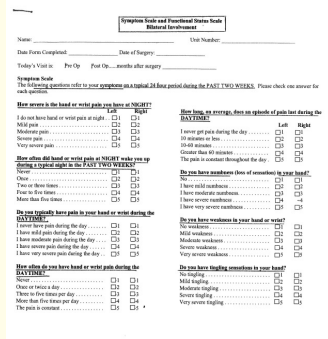


MN: Median Nerve CSA: Cross Sectional Area

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METHODS

- Outcome Measures
 - Symptom Score



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METHODS

- **Statistical Analysis**
 - Repeated measures analysis
 - Correlation coefficient (r)

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RESULTS

DWC: Distal wrist crease FA: Forearm

Time	Symptom score (points, mean ± s.e.)	DWC Area (mm ² , mean ± s.e.)	FA Area (mm ² , mean ± s.e.)
Baseline	~2.8	~16.5	~6.5
7 Days	~1.8	~14.5	~6.5
30 Days	~1.5	~14.0	~6.5
180 Days	~1.8	~13.5	~6.5

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RESULTS

Measurements over time

Variable	Baseline	7 days	30 days	180 days	P-value
Questionnaire findings					
Mean Symptom Score	2.70	1.83	1.58	1.80	<0.001
Ultrasound Parameters					
Mean wrist area	15.86	13.15	12.83	12.50	<0.001
Mean forearm area	6.56	6.52	6.40	6.10	0.335

Significant correlations

Variable Pair	Correlation Coefficient (r)	P-value
Wrist area-Symptom Score	0.53	0.044

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DISCUSSION

- Repeated mechanical stresses of the flexor tendons around the nerve with resultant synovial tissue hyperplasia and increased pressure inside the tunnel comprise the leading theory of median nerve compression in idiopathic carpal tunnel syndrome

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DISCUSSION

- The rapid decrease in the cross-sectional area of the median nerve at the distal wrist crease level after a single corticosteroid injection suggests that inflammation of the nerve is a reversible component of the pathogenic process of idiopathic carpal tunnel syndrome

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CONCLUSIONS

- ✓ The cross-sectional area of the median nerve at the wrist level significantly decreased one week after a single, intracarpal corticosteroid injection
- ✓ The decrease in nerve size significantly correlated with improvement in symptom score following the injection
- ✓ High-resolution ultrasound is a useful tool for the assessment of the median nerve size response to the corticosteroid injection

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THANK YOU!

