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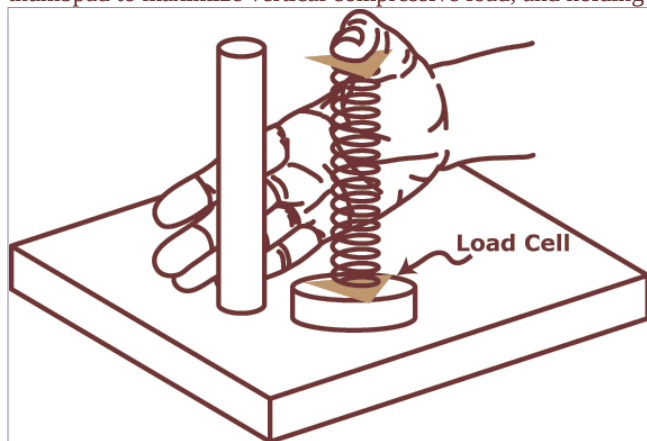
The Strength-Dexterity Test Is A Novel And Clinically Informative Measure Of Treatment Outcome In Thumb Osteoarthritis

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OBJECTIVES: We lack quantitative and objective measures of treatment outcome for dynamic thumb function. We study if the Strength-Dexterity (S-D) Test is a sensitive measure of functional improvement after treatment in patients with symptomatic carpalometacarpal osteoarthritis (CMC OA).

METHODS: 18 CMC OA patients received weekly intra-articular injections of Hylan G-F 20 for 3 consecutive weeks. Functional evaluation at baseline (before 1st injection) and at 12 weeks included visual analog scale (VAS) for pain; Disabilities of the Arm, Shoulder and Hand Questionnaire (DASH, a validated measure of upper arm function); key and opposition **pinch strength**; and mean sustained maximal load from the **S-D Test**. This Test requires compressing a slender spring prone to buckling using the thumbpad to maximize vertical compressive load, and holding it for 5 seconds (Fig).



RESULTS: Average age was 63 yrs, (range 46-77), 72% female, 94% Caucasian. 3 patients dropped out: 1 had CMC surgery, 1 had new wrist inflammatory arthritis, 1 fractured her shoulder. 2 patients could not sustain a steady load in the S-D Test. At 12 weeks, the S-D Test ($p=0.0088$), DASH ($p=0.0008$) and VAS ($p=0.045$) scores improved significantly, but key and opposition pinch strengths did not (Table).

	Baseline (n=18) Mean (SD)	12 weeks (n=15) Mean (SD)	Mean Change (SD)	p-value
Maximum Key Grip (N)	51.6 (26.7)	58.7 (23.1)	2.2 (19.1)	0.1985
Maximum Opposition Grip (N)	38.7 (24.9)	50.3 (21.8)	8.0 (22.2)	0.1985
VAS for pain (mm) (100=worst 0=best)	62 (18)	47 (23)	-14.7 (30.4)	0.045
DASH (100=worst 0=best)	38.0 (20.3)	20.3 (13.1)	-14.8 (20.6)	0.0008
S-D Test (n=13) (N)	2.64 (0.19)	2.84 (0.21)	0.20 (0.23)	0.0088

After treatment, the Spearman correlation of the S-D Test with opposition and key pinch strengths was poor ($r=-0.05$ $p=0.9$; $r=0.33$ $p=0.3$).

CONCLUSIONS: The S-D Test showed a significant improvement after treatment. The DASH and VAS, both clinically important outcomes measures for CMC OA, also showed significant improvement. This suggests that the S-D Test, designed to specifically target dynamic pinch function, is clinically informative unlike the DASH and VAS scores that are indirect measures of hand function. Moreover, the S-D Test may be more informative of functional improvement than key and opposition pinch strengths, traditional measures of thumb function, which not change significantly. The S-D test will now be included in larger randomized controlled trials to assess its potential to become a standard measure of pinch function.

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