Photograph-Based vs. Clinical Goniometry: **Can Pictures Improve Follow-Up in Dupuytren's Disease?**

Titel: Comparing the accuracy of clinical goniometry and goniometric measurements on standardised images in Dupuytren's disease

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Introduction

Clinical goniometry is considered the golden standard but can often be time consuming. Uploading a standardised image to the patients file could lead to improved follow-up. The objective of this study was to compare the accuracy of clinical goniometric AED measurements with measurements taken on standardized photographs, using the same goniometer. Digits 4 and 5 were included in the study and photographic measurements were performed by two resaerchers to determine inter-observer variability.

Methods

Participants:
59 hands from patients diagnosed with Dupuytren's disease were included. Inclusion criteria: age >18, active extension deficit (AED) of MCP/PIP joints in digits 4 and 5. Exclusion criteria: finger deformities from other conditions (e.g., amputation, arthritis) or lack of consent.

Procedure:
AED was first measured clinically using a short-arm goniometer. Afterward, standardized images of the hands in maximal extension (back of hand on table) were taken at 30 cm from the processus styloideus ulnae. The image was uploaded to the patient's file. A blinded clinician measured the AED from the digital image using the same goniometer.

Randomization:
The order of clinical measurement and image capture was randomized to avoid carry-over effects.

Analysis:
Paired samples t-test compared the clinical and image-based measurements. The null hypothesis stated no significant difference. ICC was calculated to assess intra-observer variability.

Results

Paired Samples Test

	95% Confidence Interval of the Difference		
	Lower	Upper	Two-sided p
DIP4 (R2)	5.338	.701	.041
PIP4 (R2)	6.801	.893	.003
MCP4 (R2)	5.752	.755	<.001
DIP5 (R2)	19.895	2.612	.120
PIP5 (R2)	6.724	.883	.128
MCP5 (R2)	10.074	1.323	.400
DIP4 (R1)	5.258	.690	.066
PIP4 (R1)	19.607	2.575	.041
MCP4 (R1)	10.727	1.408	<.001
DIP5 (R1)	19.343	2.540	.124
PIP5 (R1)	19.473	2.557	.732
MCP5 (R1)	13.903	1.826	.025

	Intraclass correlation	Sign.
Single measures	0.906	<0.001
Average measures	0.951	<0.001

Conclusion

Photometry and clinical goniometry demonstrated statistically significant agreement for measurements of the fifth digit, but not for the fourth digit. This suggests that while clinical images may support follow-up in Dupuytren's disease, they cannot fully substitute in-person goniometric evaluation.