



# P87 Ultra-high Frequency Ultrasound Assessment in Vascular Ehlers Danlos Syndrome: a Validation and Reproducibility Study

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## ABSTRACT

**Background:** In patients with Vascular Ehlers-Danlos syndrome (vEDS), an abnormally low carotid intima-media thickness (CIMT) may increase the risk of arterial dissection and rupture. Thus its accurate assessment by ultra-high frequency ultrasound (UHFUS), thanks to its higher spatial resolution, may be clinically relevant.

**Aim:** To assess the feasibility and reproducibility of carotid parameters, assessed by UHFUS in vEDS patients, and to evaluate the agreement with the gold standard technique, echotracking by radiofrequency.

**Methods:** 16 vEDS patients were recruited (6 women,  $40 \pm 11$  years, BP  $115 \pm 6/62 \pm 6$  mmHg). Common carotid parameters were assessed by echotracking (Esaote, Artlab software) and UHFUS (VevoMD, Visualsonics; CVSuite software, Quipu srl), to evaluate agreement. The coefficient of variation between two consecutive clips was computed. The results were compared to those of 16 age-, sex- and BP-matched healthy individuals.

**Results:** In all 16 patients the acquisition and automated analysis of carotid clips was feasible. Correlation between echotracking and UHFUS was satisfactory (diameter  $r = 0.63$ ,  $p = 0.001$ ; CIMT  $r = 0.65$ ,  $p = 0.006$ ; distension  $r = 0.84$ ,  $p < 0.001$ ). Bland-Altman plots showed a good agreement between the two techniques, with a non significant bias either for diameter [ $110 \mu\text{m}$  ( $-184$ ;  $404$ )] or CIMT [ $27 \mu\text{m}$  ( $-10$ ;  $75$ )]. Intra-operator coefficient of variation was 3.26% (diameter), 7.11% (CIMT) and 5.65% (distension). vEDS patients had reduced CIMT ( $419 \pm 85$  vs  $522 \pm 97 \mu\text{m}$ ,  $p = 0.004$ ) and distension ( $453 \pm 150$  vs  $613 \pm 176 \mu\text{m}$ ,  $p = 0.01$ ) than controls and tended to have a reduced diameter ( $6558 \pm 525$  vs  $6945 \pm 653 \mu\text{m}$ ,  $p = 0.08$ ), while carotid-femoral pulse wave velocity was similar ( $7.38 \pm 1.08$  vs  $7.46 \pm 1.396$  m/s,  $p = 0.78$ ).

**Conclusion:** UHFUS is feasible, accurate and reproducible for the evaluation of carotid parameters in vEDS.

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