Supplementary Table S1: Exclusion criteria

Exclusion criteria	• Isolated thumb osteoarthritis • HOA secondary to other known causes (e.g., gout, reactive arthritis, RA, psoriatic arthritis, spondyloarthropathies, septic arthritis) • Skin psoriasis • Current skin disease of the left ear interfering with the application of the auricular electrode for stimulation (eczema, urticarial lesion, skin infection, external otitis, etc.) • Auditory canal not adapted to the application of the ear electrode • Known history of cardiac rhythm disturbances, atrioventricular block > 1st degree, conduction disturbances • Symptomatic orthostatic hypotension or history of recurrent vagal syncope • History of vagotomy • Documented sleep apnea • Existence of a painful syndrome of the upper limbs, which would interfere with assessment of HOA symptoms. • Fibromyalgia • Use of other medical devices electrically active (pacemaker, TENS for chronic pain) • Use of oral, intramuscular or intra-articular or intravenous corticosteroids, immunosuppressants (methotrexate, sulfasalazine, leflunomide, biological disease-modifying antirheumatic drugs), of hyaluronic acid infiltration in the finger joints in the previous 3 months • Any new OA treatment of the hand within the previous month, including physiotherapy and a new digital orthosis. • Hand surgery planned during the study. • Use of any investigational (unapproved) medication within 3 months prior to the screening. • Serious and uncontrolled concomitant disease, including cardiovascular, nervous system, pulmonary, renal, hepatic, endocrine, gastrointestinal or epileptic disease, which, in the opinion of the investigator, would make the study unfeasible. • Pregnant or breastfeeding woman • Patient under legal protection (guardianship or curatorship) and patient deprived of liberty • Participation in other research intervention or in the exclusion period following a previous research if applicable • Patient without social care

	• Taking NSAIDs < 48 hours

Supplementary Table S2: Reported adverse events of 4 weeks of the tVNS in EHOA patients.

Patient number	Adverse event	Related to device (Yes/No/uncertain)	Severity	Recovery at 4 weeks
2	Bilateral conjunctivitis	No	Minor	Yes
6	Local tingling	Yes	Minor	Yes
6	Hand pain when trying to replace the earpiece	Yes	Mild	Yes
6	Post-stimulation fatigue	Yes	Mild	Yes
7	Local tingling	Yes	Minor	Yes
7	Insomnia	Uncertain	Mild	No
8	Local tingling	Yes	Minor	Yes
8	Auricular device desadaptation of the cymba concha		Minor	No
12	Local auricular pain	Yes	Minor	Yes
13	Local auricular pain	Yes	Minor	No
13	Scotoma right eye	No	Minor	No
15	Local auricular pain	Yes	Minor	No
19	Floating body left eye	No	Minor	Yes