Disputes & Debates: Editors' Choice

Editors' Note: Shoulder-Tap Test for Functional Gait Disorders: A Sign of Abnormal Anticipatory Behavior

Dr. Coebergh and colleagues described exaggerated postural responses in 25 patients with functional gait disorders, following a sudden shoulder tap applied by an examiner from behind the patient. In response, Dr. Geroin et al. comment that in their own population of patients with functional neurologic disorders, a light touch on the shoulders seemed to provide fewer false-positive results, given that a sudden tap could evoke exaggerated responses in patients with disorders such as hyperekplexia or stiff-person syndrome. They also note that it is not necessary to see an intact response to a retropulsion test in patients with functional gait disorders to flag their shoulder-test response as incongruent. Responding to these comments, Dr. Coebergh agrees that a light touch would likely suffice, noting that the actual contact with the shoulders in the described shoulder-tap test is light, while also highlighting work being performed by their group in identifying sensory thresholds of force at which incongruent postural responses occur in such patients. To illustrate the potential value of observing incongruity in responses to shoulder-tap vs retropulsive stimuli in patients with functional gait disorder, Dr. Coebergh highlights a case of a patient with stiff-person syndrome misdiagnosed as a functional neurologic disorder, in whom such incongruity was not observed. This exchange demonstrates the enduring value of systematic clinical examinations and observations in improving the diagnosis of functional neurologic disorders.

Aravind Ganesh, MD, DPhil, FRCPC, and Steven Galetta, MD
Neurology® 2022;99:38. doi:10.1212/WNL.0000000000200865

Reader Response: Shoulder-Tap Test for Functional Gait Disorders: A Sign of Abnormal Anticipatory Behavior

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In a recent report, Coebergh et al.[1] introduced the shoulder-tap test, which helps to reveal incongruity in patients with functional gait disorders. Specifically, the authors observed an exaggerated postural response in 82% of patients, following a gentle shoulder tap applied from behind the patient.[1] We applaud the described approach because incongruencies of symptoms and signs have great diagnostic value when diagnosing a functional neurologic disorder.[2-4] We hope to extend the findings of Coebergh et al. by making 2 additional points.

As observed in our population of functional neurologic disorders, a light touch on the shoulders instead of a shoulder tap might be more informative and provide fewer false-positive results because a sudden tap can evoke an exaggerated postural response in patients with hyperekplexia or stiff-person syndrome. This movement would then incorrectly be classified as an incongruent response. In addition, the authors state that incongruity involves an abnormal response to the shoulder tap combined with an intact response to the normal retropulsion test. We would argue

Author disclosures are available upon request (journal@neurology.org).

that an isolated abnormal response to a mere touch to the shoulders would already suggest incongruity, with a consideration for rare organic disorders such as hyperekplexia and stiff-person syndrome.

1. Coebergh J, Zimianiti I, Kaski D. Shoulder-tap test for functional gait disorders: a sign of abnormal anticipatory behavior. *Neurology*. 2021;97(23):1070-1071.
2. Espay AJ, Aybek S, Carson A, et al. Current concepts in diagnosis and treatment of functional neurological disorders. *JAMA Neurol*. 2018;75(9):1132-1141.
3. Nonnekes J, Růžička E, Serranová T, Reich SG, Bloem BR, Hallett M. Functional gait disorders: a sign-based approach. *Neurology*. 2020; 94(24):1093-1099.
4. Gupta A, Lang AE. Psychogenic movement disorders. *Curr Opin Neurol*. 2009;22(4):430-436.

Author Response: Shoulder-Tap Test for Functional Gait Disorders: A Sign of Abnormal Anticipatory Behavior

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We welcome the comments by Dr. Geroin et al.[1] on our article. We agree that a light touch may be a sufficient stimulus to induce an anticipatory postural response in patients with functional gait disorders, without the need for a "tap." Although the video linked to our article shows a rapid downward movement of the examiner's hands onto the shoulders, the actual contact with the shoulders is in fact light, lending credence to our esteemed colleagues' observations. Whether there exists a sensory threshold of force, at which an incongruent or inappropriate postural response occurs following a touch to the shoulders, is an interesting question that we hope to be able to address in our future work. In fact, we are extending our work to explore the shoulder-tap test in elderly people with a fear of falling—a common symptom in which abnormal anticipatory behaviors likely exist and identification of such thresholds may be of particular interest.

We also agree that an abnormal response to a light shoulder tap would be an incongruent response to such a stimulus, but, as we describe in our article, a normal response to a retropulsive stimulus or a pull after an abnormal shoulder tap provides further evidence of incongruity.

Finally, we have recently seen a patient with stiff-person syndrome who had been previously misdiagnosed as having a functional neurologic disorder; the clue to the actual diagnosis, beyond the presence of auditory startle and hyperlordosis, was indeed the absence of any incongruity in postural responses. We therefore appreciate the comments regarding this rare but treatable disorder and the importance of avoiding undue force during a shoulder tap or touch that would render interpretation of the ensuing behavior more challenging.

1. Coebergh J, Zimianiti I, Kaski D. Shoulder-tap test for functional gait disorders: a sign of abnormal anticipatory behavior. *Neurology*. 2021;97(23):1070-1071.

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CORRECTION

In Vivo Diagnosis of Synucleinopathies

A Comparative Study of Skin Biopsy and RT-QuIC

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In the article "In Vivo Diagnosis of Synucleinopathies: A Comparative Study of Skin Biopsy and RT-QuIC" by Donadio et al.,[1] the first paragraph of the Methods section should indicate that of the 31

Table 4 Immunofluorescence and Real-Time Quaking-Induced Conversion (RT-QuIC) Results of Skin and CSF Samples

			Skin			
Variable	**Cases, n**	**Diagnosis**	**Protocol**	**Immunofluorescence**	**RT-QuIC**	**CSF, RT-QuIC**
Synucleinopathies	1	PD (1 patient[a])	III	+	+	+
	2	PD (6 patients[a])	III	+	+	ND
	3	PD (1 patient)	II	+	+	+
	4	PD (3 patients[a])	II	+	+	ND
	5	PD (5 patients)	III	+	+	ND
	6	PD (1 patient[a])	I	–	+	ND
	7	MSA-C (1 patient)	III	+	+	+
	8	MSA-P (3 patients)	I	+	+	ND
	9	MSA-P (1 patient)	I	–	–	ND
	10	MSA-P (1 patient)	I	+	-	ND
	11	MSA-P (1 patient)	I	-	+	ND
	12	MSA-C (1 patient)	I	+	ND	-
	13	Lewy body dementia (1 patient)	III	+	-	ND
	14	Lewy body dementia (2 patients)	II	+	+	+
	15	Lewy body dementia (1 patient)	I	+	+	+
	16	Lewy body dementia (1 patient)	I	+	+	ND
	17	PAF (1 patient)	II	+	+	+
	18	PAF (1 patient)	II	–	–	–
	19	PAF (1 patient)	I	+	+	ND
Nonsynucleinopathies	1	AD (5 patients)	III	–	–	–
	2	AD (2 patients)	III	–	+	–
	3	AD (1 patient)	III	–	–	ND
	4	AD (1 patient)	III	-–	+	ND
	5	AD (2 patients)	II	–	–	–
	6	AD (1 patient)	II	–	–	ND
	7	AD (2 patients)	I	–	-	–
	8	AD (1 patient)	I	–	–	ND
	9	PSP (1 patient)	III	–	+	ND
	10	PSP (2 patients)	II	–	–	–

Continued

Table 4 Immunofluorescence and Real-Time Quaking-Induced Conversion (RT-QuIC) Results of Skin and CSF Samples *(continued)*

Variable	Cases, n	Diagnosis	Skin			CSF, RT-QuIC
			Protocol	Immunofluorescence	RT-QuIC	
	11	CBS (1 patient)	II	–	-	ND
	12	CBS (1 patient)	II	–	+	ND
	13	Vascular parkinsonism (3 patients[a])	III	–	–	ND
	13	Vascular parkinsonism (1 patient)	II	–	–	–
	14	Vascular parkinsonism (2 patients[a])	II	–	–	ND
	15	Vascular parkinsonism (2 patients)	I	–	–	–
	16	Iatrogenic parkinsonism (1 patient)	I	–	–	ND
	17	Autoimmune parkinsonism (1 patient)	II	–	–	–
	18	Vascular dementia (1 patient)	III	–	–	–
	19	Vascular dementia (1 patient)	II	–	+	–
	20	ALS (1 patient)	III	–	+	–
	21	ALS (1 patient)	II	–	+	–
	22	ALS (3 patients)	I	–	-	–
	23	ALS (1 patient)	I	–	+	ND
Controls	1	Small fiber neuropathy (3 patients)	III	–	–	–
	2	Small fiber neuropathy (2 patients)	III	–	–	ND
	3	Small fiber neuropathy (1 patient)	I	–	–	–
	4	Small fiber neuropathy (1 patient)	I	–	–	ND
	5	Peripheral neuropathy (1 patient)	III	–	+	ND
	6	Peripheral neuropathy (1 patient)	II	–	-	-
	7	Peripheral neuropathy (1 patient)	II	–	+	-
	8	Peripheral neuropathy (1 patient)	I	–	-	-
	9	Peripheral neuropathy (1 patient)	I	–	-	ND
	10	CIDP (1 patient)	I	–	-	-
	11	Wernicke encephalopathy (1 patient)	I	–	-	-
	12	Depression (1 patient)	III	–	-	-
	13	Depression (2 patients)	III	–	-	ND
	14	Depression (2 patients)	II	–	-	-
	15	Cerebral vasculitis (1 patient)	II	–	-	-
	16	Cerebral vasculitis (1 patient)	II	–	ND	-
	17	SCD (1 patient)	III	–	+	-
	18	SCD (1 patient)	II	–	-	-
	19	Stiff-person syndrome (1 patient)	I	–	-	ND

Abbreviations: AD = Alzheimer disease; ALS = amyotrophic lateral sclerosis; CBS = corticobasal syndrome; CIDP = chronic inflammatory demyelinating polyneuropathy; MSA-C = multiple system atrophy, cerebellar type; MSA-P = multiple system atrophy, parkinsonian type; ND = not done; PAF = pure autonomic failure; PD = Parkinson disease; PSP = progressive supranuclear palsy; SCD = subjective cognitive disorder.
[a] Patients from whom 10 skin samples were taken; in the remaining patients, 8 skin samples were taken combining the routine and study protocols (see Methods for more details).

patients with synucleinopathies, 15 were patients with Parkinson disease, and of the 38 patients with nonsynucleinopathies, 7 were patients with vascular parkinsonism. The authors regret the errors.

In addition, the Diagnosis column of Table 4 should read "patients" in parentheses, not "points." See the corrected Table 4. The publisher regrets the errors.

Reference

1 Donadio V, Wang Z, Incensi A, et al. In vivo diagnosis of synucleinopathies: a comparative study of skin biopsy and RT-QuIC. *Neurology*. 2021;96(20): e2513-e2524.

NOTICE

Dual Publication: Spinal Cord Injury, Vertebral Artery Dissection, and Cerebellar Strokes After Chiropractic Manipulation

Neurology® 2022;99:42. doi:10.1212/WNL.0000000000200334

The Editors of *Neurology*® and *Internal and Emergency Medicine* issue a notice of publication of 2 reports of a single patient written by 2 different author groups.

Macêdo MB, Shinjo SK, Domiciano DS. Breaking the Diagnosis: Ankylosing Spondylitis Evidenced by Cervical Fracture following Spine Manipulation. Intern Emerg Med 2021. DOI: 10.1007/s11739-021-02829-2.

Ramos GB, Martins RR, Souza JCC, Falcão FCSEB, Lopes CCB, Andrade ALG, Silva GD. Spinal Cord Injury, Vertebral Artery Dissection, and Cerebellar Strokes after Chiropractic Manipulation. Neurology 2021. DOI: 10.1212/WNL.0000000000013078.

The first article was published in *Internal and Emergency Medicine*. The journal received it on July 20, 2021, accepted it on August 10, 2021, and published it online on August 20, 2021. The second article was published in *Neurology*. It was received on July 16, 2021, accepted on November 4, 2021, and published online on November 18, 2021. The 2 case reports were based on the same patient and shared a common image.

Both case reports were written by authors from the Faculdade de Medicina, Universidade de São Paulo. The authors of the article published in *Internal and Emergency Medicine* were affiliated with the Department of Rheumatology, and the authors of the *Neurology* article were affiliated with the Department of Neurology.

The authors of both articles were contacted and asked for an explanation for the dual publication. Both teams of authors explained that they cared for the patient during the hospital admission and that they were unaware of the submission by the other team. The focus of the articles is different: one focused on bone injury and emergency care and the other on the neurologic aspects of the case. Both author groups apologize for the duplicate submissions.

A reader first notified *Neurology* that the case had been published in the 2 journals and a brief report was submitted to *Neurology*'s Disputes & Debates section on November 29, 2021.[1]

Reference

1. Trager RJ, Garcia JA. *Disputes & Debates: Rapid Online Correspondence. Reader Response: Spinal Cord Injury, Vertebral Artery Dissection, and Cerebellar Strokes after Chiropractic Manipulation*. n.neurology.org/content/reader-response-spinal-cord-injury-vertebral-artery-dissection-and-cerebellar-strokes-after.

Dual Publication: Spinal Cord Injury, Vertebral Artery Dissection, and Cerebellar Strokes After Chiropractic Manipulation

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