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False positive Hoover's Sign in Apraxia

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Hoover's sign and hip abductor sign are positive diagnostic features of functional leg weakness in patients with functional neurological disorders (FND) (1). Hoover's sign describes weakness of voluntary hip extension which returns to normal with contralateral hip flexion against resistance, whereas hip abductor sign is involuntary abduction of the weak leg while the contralateral leg is abducted against resistance (1). Although clinical studies, including our own (1), suggest high sensitivity and specificity, the nature of the sign predicts false positives in certain other neurological conditions.

The daughter of a 90-year old woman emailed one of the authors (JS) wondering if her mother's undiagnosed condition was FND. The patient had a 5 year history of progressive inability to move her left arm and leg properly. Her daughter had noticed that she was able to walk better and use her arm in a more appropriate way when she was distracted. The patient told us that sometimes her left arm and leg did not respond to her control and "*they did funny things"*. Memory and concentration were preserved, mood was low but she was still maintaining her activities.

Neurological examination demonstrated hypomimia, marked left-sided rigidity affecting arm and leg, dystonia and severe apraxia (probably with limb-kinetic and ideomotor components), worse on the left side. (Video 1, Segment 1). Hoover's and hip abductor signs were clearly positive (Video 1, Segments 2 and 3). Brain MRI showed posterior cortical atrophy, while SPECT-DaTscan was normal (Video 1, Segment 1).

We made a clinical diagnosis of Corticobasal Syndrome (CBS), with uncertain underlying pathology (2). As previously described, abnormal brain SPECT-DaTscan is not a mandatory feature of the disease (3).

Hoover's sign and the hip abductor sign indicate a discrepancy between voluntary movement and automatic movement. In apraxia, particularly in the ideomotor variant, similar "voluntary-automatic dissociation" is well described as an inability to execute a specific movement outside the natural context in which it occurs (4).

There may be shared brain pathways that explain why these clinical signs overlap. Several functional imaging studies in motor FND have found dysfunction of the temporoparietal junction, precuneus and other parietal areas as, suggesting abnormalities in the network responsible for an individual's 'agency' of movement. At another level, FND has been conceptualised as a distortion of 'top down' predictions and idea of limb function. Apraxia could be seen as a structural correlate of that phenomenon.

All clinical signs have their limitations. This case reinforces that any positive sign of FND should always be interpreted in the context of the whole clinical picture. In this case, the presence of apraxia was a clear alternative explanation for the positive Hoover's sign rendering the sign non-diagnostic. Dissociated emotional and voluntary facial movement in opercular syndrome, improvement when walking backwards or running in dystonia, aura of paroxysmal kinesigenic dyskinesia, and the ability to suppress movements in Tourette's syndrome are examples of similar diagnostic pitfalls (5).

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Author Roles

1. Research project: A. Conception, B. Organization, C. Execution;

2. Statistical Analysis: A. Design, B. Execution, C. Review and Critique;

3. Manuscript Preparation: A. Writing of the first draft, B. Review and Critique.

TE: 1A, 1B, 1C, 3A

JS: 1A, 1B, 1C, 3B

Disclosures

Ethical Compliance Statement: The authors confirm that the approval of an institutional review board was not required for this work. The patient has given written and informed consent for online publication of her videos. We also confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this work is consistent with those guidelines.

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References

1. Stone J, Aybek S. Functional limb weakness and paralysis. 1st ed. Vol. 139, Handbook of Clinical Neurology. Elsevier B.V.; 2016. 213–228 p.
2. Greene P. Progressive Supranuclear Palsy, Corticobasal Degeneration, and Multiple System Atrophy. Continuum (Minneap Minn) 2019 Aug;25(4):919–35.
3. Cilia R, Rossi C, Frosini D, Volterrani D, Siri C, Pagni C, et al. Dopamine Transporter SPECT Imaging in Corticobasal Syndrome. Dawson TM, editor. PLoS One. 2011 May 2;6(5):e18301.
4. Leiguarda RC, Marsden CD. Limb apraxias. Brain. 2000 May;123(5):860–79.
5. Stone J, Reuber M, Carson A. Functional symptoms in neurology: mimics and chameleons. Pract Neurol. 2013;13(2):104–13.

Supporting information

Supporting information may be found in the online version of this article.

Video 1. Segment 1. CBS clinical and radiological features. Left-sided upper limb apraxia and hand dystonia; left-sided stiffness; upper limb apraxia, worse on the left side; posterior cortical atrophy on brain MRI; and normal SPECT-DaTscan. **Segment 2.** Positive Hoover's sign. **Segment 3.** Positive Hip abductor sign.