An Unusual Presentation of a Functional Movement Disorder following Vaccination for COVID-19: a Case Report

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Introduction

Functional movement disorders (FMD) commonly present with unilateral weakness, focal dystonia, tremor, or myoclonus[1]. They are typically viewed as a diagnosis of exclusion secondary to a psychological problem. This view is shifting towards making positive diagnoses based on clinical signs, and recognition of physical triggers, such as illnesses or vaccine[2], including for COVID-19 [3-6]. Positive diagnostic markers are few, though neurophysiological markers have been identified for functional jerks, tremor, and weakness[7].

Aims

- To describe an unusual presentation of FMD following a vaccination for COVID-19
- To highlight the use of neurophysiology in the diagnosis of certain phenotypes of FMD and raise a potential positive diagnostic marker for similar cases.

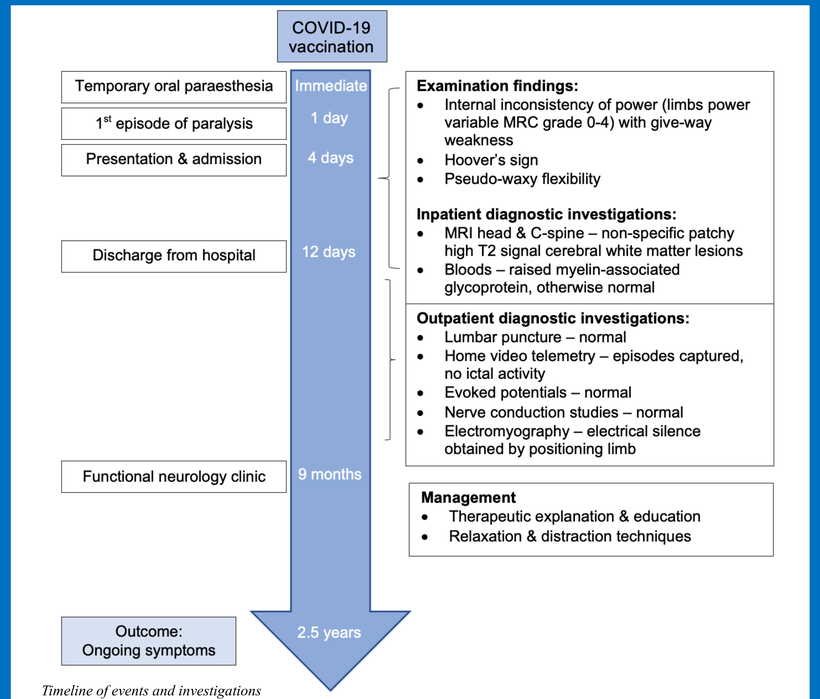
Case Presentation

Background
•Previously fit and well 65-year old female cleaner
•History of migraines and concussive head injury 20 years prior
•No known psychological or social stressors

Initial presentation
The patient presented to the emergency department after four episodes of apparent global paralysis (with marked co-contraction). In the first episode, she awoke unable to move, open her eyes, or talk, which gradually improved after an hour. Between episodes, she felt generally weaker and fatigued. She had received her second COVID-19 a few days prior to her presentation.

Differential diagnoses included FMD, seizure activity, demyelination, and stiff person syndrome. After investigations to rule out these other pathologies (see timeline), she was referred to the functional neurology clinic.

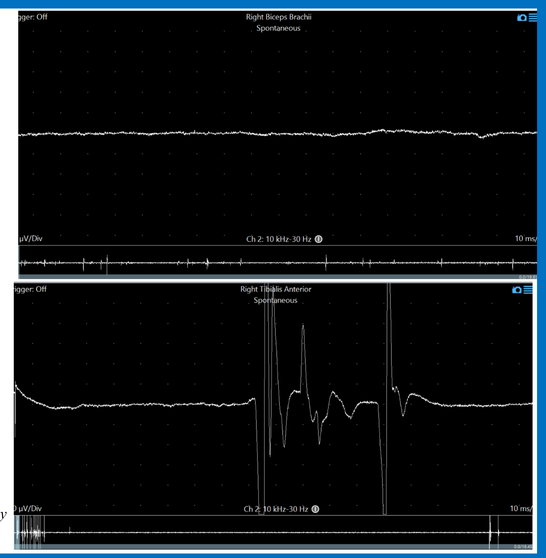
Evolving presentation
At a functional neurology clinic nine months later, she had ongoing severe unpredictable episodes and a diagnosis of FMD made. Episodes could involve her limbs or whole body, including her mouth, speech and swallow. During the consultation she was unable to make voluntary movements; however, when a part of her body was moved, she would maintain that position, in a manner reminiscent of catatonic posturing. For example, she needed her head lifting to be able to make eye contact, and her fingers had to be pried open to release her bag strap. Internal inconsistencies were evident; she was able to walk with a shuffling gait but was unable to move her legs when asked. Now over two years later, her symptoms remain ongoing.



Timeline of events and investigations

Neurophysiology

Electromyography (EMG) was performed during an episode. Periods of electric silence were obtained in otherwise healthy resting muscle "just by adjusting the limb position, "*as if the patient was a wax doll*". This demonstrated internal inconsistency during the pseudo-waxy flexibility.



EMG traces showing motor units (top) and repositioning of the limb followed by electrical silence (bottom)

Discussion

- This case demonstrates a debilitating 'wax doll-like' presentation of FMD with global intermittent transient apparent paralysis and pseudo-waxy flexibility. Although the latter may be elicited in the 'arm-drop' test'[1], it is not usually a major feature.
- The EMG finding of easily obtainable electrical silence in healthy resting muscle simply by repositioning of the limb could be considered a positive neurophysiological marker for this type of FMD. It would not typically be as easy to obtain full relaxation and electrical silence.[2]
- The temporal relationship to the COVID-19 vaccination supported this being a precipitating factor.
- The main treatment options are multidisciplinary, ideally including physiotherapy, occupational and psychological therapies. However, the low availability of specialist services in many regions, such as in this case, can lead to a lack of support and treatment options.

Conclusions

This case demonstrates an unusual presentation of FMD and highlights a potential neurophysiological diagnostic marker for this presentation. Management should ideally include a multidisciplinary approach and targeted therapies; however, this area needs much development to allow access across UK regions.

References

1. Stone J, Carson A, Sharpe M. Functional symptoms and signs in neurology: assessment and diagnosis. *J Neurol Neurosurg Psychiatry* 2005;**76**:ii2-i12.
2. Stone J, Aybek S. Functional weakness and paralysis. *Handb Clin Neurol* 2016;139:213-28.
3. Ercoli T, et al. Functional neurological disorder after COVID-19 vaccination. *Neurol Sci* 2021**42**(10):3989–90.
4. Fobian AD, Elliott L. A review of functional neurological symptom disorder etiology and the integrated etiological summary model. *J Psychiatry Neurosci* 2019;**44**(1):8–18.
5. Fasano A, Daniele A. Functional disorders after COVID-19 vaccine fuel vaccination hesitancy. *J Neurol Neurosurg Psychiatry* 2022;**93**:339-340.
6. Alonso-Canovas A, Kurtis MM, Gomez-Mayordomo V, *et al.* Functional neurological disorders after COVID-19 and SARS-CoV-2 vaccines: a national multicentre observational study *Journal of Neurology, Neurosurgery & Psychiatry* 2023;**94**:776-777.
7. Thomsen BLC, Teodoro T, Edwards MJ. Biomarkers in functional movement disorders: a systematic review. *J Neurol Neurosurg Psychiatry* 2020;**91**:1261-69.
8. Mills KR. The basics of electromyography. *J Neurol Neurosurg Psychiatry* 2005;**76**:ii32–5.

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