



## Task-specific focal chin tremor in idiopathic Parkinson's disease: is it an isolated phenomenon or a part of parkinsonism?

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Dear Editor,

Jaw or chin tremor is relatively common in patients with Parkinson's disease (PD), typically occurring when the mouth is at rest [1]. Chin tremor has also been reported in patients with essential tremor (ET) [2]. However, chin tremor is not the only a phenomenon common to both diseases.

Focal, task-specific tremors are most common in the hand and arm, with the most common form being primary writing tremor [3]. Focal chin tremor can also occur exclusively during specific tasks [4, 5]. Such focal, task-specific tremors have also been found in ET [6].

Herein, we report a rare finding of multiple motor phenomena: task-specific chin tremor and Parkinson's disease.

A 75-year-old female patient complained of tremor in her chin and hands and gait disturbance 1 month before her visit to our movement disorder clinic. She complained of intermittent hand tremor and slow gait. The patient also reported that chin tremor occurred only during tooth brushing. Five months before her visit, she received a successful coil embolization of an asymptomatic and incidental basilar tip aneurysm. She had a dental implant of her left lower molar tooth at a local dentist clinic 5 years before. She did not experience any surgical complications or abnormal sensory disturbance afterward. She did not drink alcohol or smoke. The patient did not have any medical diseases and had not taken any medications such as neuroleptics, calcium channel blockers, or prokinetics. Her

family members did not have any movement disorders, such as tremor or parkinsonism.

Neurologic examination revealed intermittent right-hand resting tremor, masked face, and asymmetric bradykinesia and rigidity predominant on the right side. Her postural reflex was normal, but her gait was slow with short steps and subtle rigid joint movements. Cranial nerve function tests were normal, and no pyramidal signs or sensory abnormalities were found. Her functional status was 2 scored with the modified Hoehn and Yahr scale.

Chin tremor was not present at rest and was not provoked by specific jaw positions. No cranial dystonia was noted. Usual activities, such as drinking, chewing, and speaking, did not evoke any tremor (video segment 1). Focal chin tremor was found exclusively during tooth brushing and disappeared immediately after stopping (video segment 2). No alleviating maneuvers reduced the tremor.

Blood test results, including thyroid function, were normal. Magnetic resonance imaging of the brain did not reveal any structural anomalies. Positron emission tomography using <sup>18</sup>F-N-(3-fluoropropyl)-2beta-carbon ethoxy-3beta-(4-iodophenyl) nortropine demonstrated asymmetric reduced dopamine transporter uptake at the posterior putamen and caudate, predominantly on the left (Fig. 1). Based on the clinical and laboratory findings, her tentative diagnosis was PD and focal, task-specific chin tremor. The levodopa was slowly increased to 300 mg for 1 month, and the patient noted significant improvement of her parkinsonism and disappearance of task-specific chin tremor.

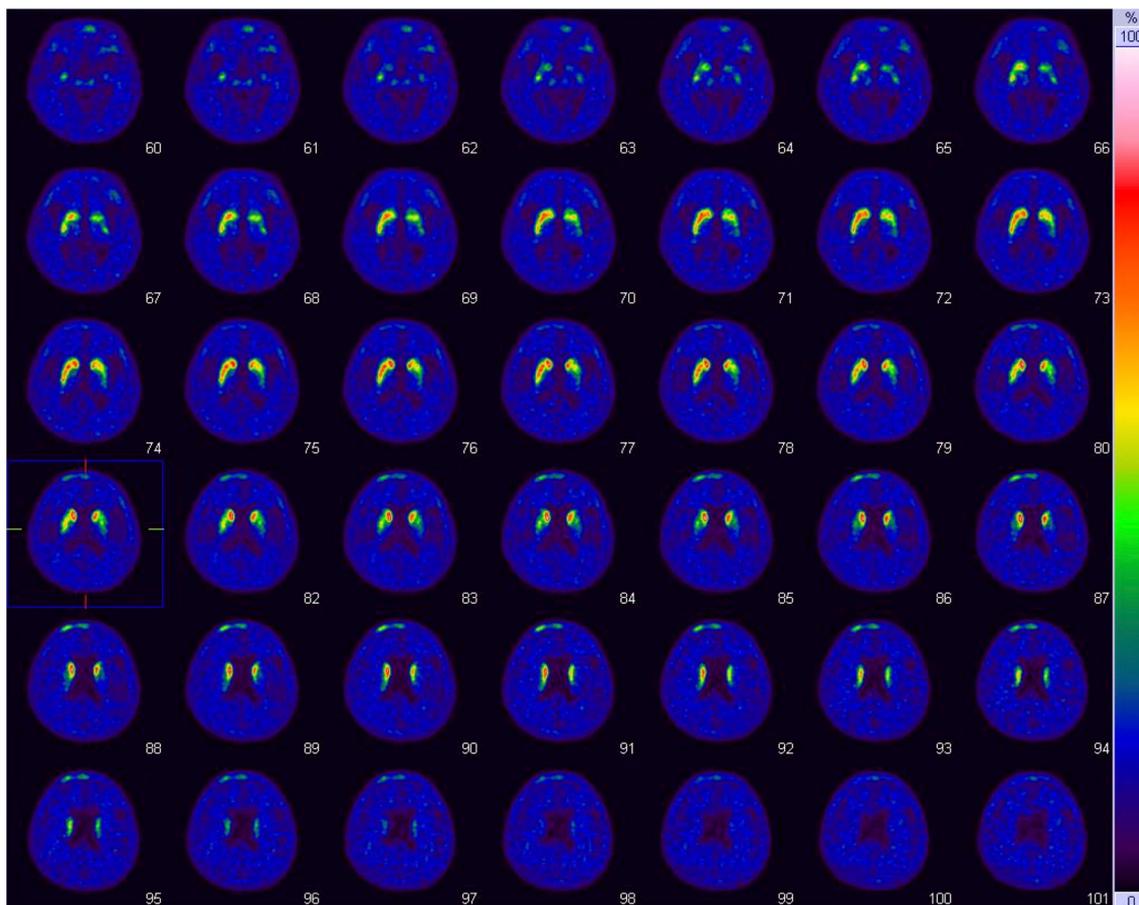
This is the first report of task-specific chin tremor with tooth brushing in addition to PD tremors. Not only is this chin tremor rare, but it also differs from other task-specific movement disorders in that its specificity is related to an ordinary daily activity, not a skilled task. Other task-specific tremors have been reported mainly in the hands, such as primary

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**Fig. 1** Positron emission tomography using  $^{18}\text{F}$ -N-(3-fluoropropyl)-2beta-carbon ethoxy-3beta-(4-iodophenyl) nortropane demonstrated decreased dopamine transporter uptake at the posterior putamen and caudate, predominantly on the left

writing tremor, and in the mouth of people who have excessive repetitive movements [7, 8].

The exact mechanism of the task-specific tremor is not known in this patient. In general, excessively reduced inhibition due to maladaptive central plasticity by motor dexterity through training has been suggested to manifest as task-specific dystonia or tremor [9]. Repetitive motor behaviors build a revised motor network that is prone to tremors [6]. Altered brain network in task-specific tremor was also suggested by functional neuroimaging [10]. As ordinary activity can also produce dystonia [8] through abnormal plasticity, our case of task-specific chin tremor with tooth brushing could also be explained by this mechanism.

In this patient, task-specific chin tremor occurred with motor features of PD. The dramatic responses to levodopa of both the patient's parkinsonism and chin tremor may further substantiate the shared pathophysiology between the two. In addition, the temporal association might support a pathophysiological association of these two phenomena. However, task specificity and parkinsonism may be a coincidental occurrence. Another possibility is comorbid ET. Whether task-specific tremor is a variant of ET remains unclear, despite the possible connection [3]. The ET spectrum has expanded

to overlap with other forms of tremors. Accumulating evidence suggests that tremor syndromes of different origins, including task-specific tremor, may share similar mechanisms [2, 3, 9]. The overlap between ET and PD [2] might suggest that a single motor network encompasses task specificity, tremor syndrome, and parkinsonism.

In summary, we report a rare case of task-specific chin tremor and PD, of which the pathophysiology remains unclear.

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### Compliance with ethical standards

**Ethics** The institutional review board at St. Mary's Hospital approved this case report.

**Conflict of interest** The authors declare that they have no conflicts of interest.

**Patient consent** The patients have consented to the submission of the case report to the journal.

## References

1. Thenganatt MA, Louis ED (2012) Distinguishing essential tremor from Parkinson's disease: bedside tests and laboratory evaluations. *Expert Rev Neurother* 12(6):687–696
2. Thenganatt MA, Jankovic J (2016) The relationship between essential tremor and Parkinson's disease. *Parkinsonism Relat Disord* 22(S1):S162–S165
3. Rana AQ, Vaid HM (2012) A review of primary writing tremor. *Int J Neurosci* 122(3):114–118
4. Miles TS, Findley LJ, Rothwell JC (1997) Electrophysiological observations on an unusual, task specific jaw tremor. *J Neurol Neurosurg Psychiatry* 63(2):251–254
5. O'Gorman CM, Bower JH, Matsumoto JY, Kantarci OH, Kumar N (2014) When drinking makes the tremor worse: a task-specific orolingual tremor. *Mov Disord Clin Pract* 1(3):237–239
6. Elble RJ (2016) The essential tremor syndromes. *Curr Opin Neurol* 29(4):507–512
7. Bhatia KP, Bain P, Bajaj N, Elble RJ, Hallett M, Louis ED, Raethjen J, Stamelou M, Testa CM, Deuschl G, Tremor Task Force of the International Parkinson and Movement Disorder Society (2018) Consensus statement on the classification of tremors. From the task force on tremor of the International Parkinson and Movement Disorder Society. *Mov Disord* 33(1):75–87
8. Yoo SW, Park IS, Park HE, Kim JS (2015) Non-occupational task-specific masticatory dystonia. *Neurol Sci* 36(2):339–340
9. Lee A, Schoonderwaldt E, Chadde M, Altenmüller E (2014) Movement induced tremor in musicians and non-musicians reflects adaptive brain plasticity. *Front Psychol* 5:824
10. Lenka A, Jhunjhunwala KR, Panda R, Saini J, Bharath RD, Yadav R, Pal PK (2017) Altered brain network measures in patients with primary writing tremor. *Neuroradiology* 59(10):1021–1029