Wrist clonus mimicking as action-induced tremors: an important clinical lesson

Bhawna Sharma, Raghavendra Bakki Sannegowda, Kadam Nagpal, Rahul Jain

Department of Neurology, SMS Medical College Hospital, Jaipur, Rajasthan, India

Correspondence to
Bhawna Sharma,
sharmadrhawna@gmail.com

SUMMARY

We report a 35-year-old man who presented with abnormal movement of hand upon extension at wrist joint in an outstretched arm. He was diagnosed and treated elsewhere as having action-induced tremors. On examination, he had action-induced clonus at wrist joint with bilateral corticospinal tract features in the form of weakness, spasticity and extensor plantars. Evaluation also revealed cervical compressive myelopathy. The purpose of presenting this case report is to highlight this rare clinical sign which can be mistaken for action-induced tremors.

BACKGROUND

Although simple to elicit, wrist clonus is hardly elicited in clinical practice. However, patient himself can present with abnormal hand movements which can be mistaken and treated as action-induced tremors. Proper history and clinical examination is very important in medicine, particularly in neurology, hence every possible attempt should be made to elicit it.

CASE PRESENTATION

A 35-year-old man, deaf and mute by birth, presented to us with 5 months history of abnormal movement of hand upon giving jerk at wrist joint and sometimes even spontaneously. Actually, the patient had gone to many consultants in the past only for this symptom as a sole complaint and he was diagnosed as having action-induced tremors for which he was treated with a β -blocker. We really tried hard in eliciting the history by conveying our questions to him through his family members who could communicate with him through hand signs.

However, upon eliciting the history, the patient and his family members gave a history of weakness in both lower limbs of 5 months duration which was insidious in onset and gradually progressive and was associated with stiffness in both legs. He had difficulty in walking and difficulty in getting up from squatting and sitting position. He also had difficulty in climbing stairs and getting down. There was no history of bulbar, bowel and bladder symptoms. There was no history of any imbalance or sensory symptoms.

His general physical examination was within normal limits and the vitals were stable. His neurological examination revealed normal cranial nerve examination other than being deaf and mute. His power in all the four limbs was 4/5 and he had increased tone in all the four limbs in the form of spasticity. All the reflexes were exaggerated with bilateral ankle and patellar clonus. Finger flexion was positive and bilateral plantars were extensor. His

gross sensory examination was normal; however, a detailed examination including vibration and joint position sensation could not be elicited as the patient could not understand the instructions. His cerebellar examination and skull and spine examination were normal. Gait was spastic in type. Interestingly, one important clinical feature was noticed in this patient that extension of hand at wrist-joint led to clonus in hands bilaterally. Sometimes, the patient himself could elicit this clonus-like movement upon giving jerk at the wrist joint.

INVESTIGATIONS

His blood haemogram and biochemistry were normal. His MRI brain was normal. MRI spine revealed cervical compressive myelopathy at the C4–C5 level due to disc dessication with diffuse bulge and canal narrowing with focal myelomalacia of the cord (figure 1). Incidental old compressive fracture of L1 vertebra was also noted.

DIFFERENTIAL DIAGNOSIS

Action-induced tremors.

TREATMENT

He was treated with antispastic medications, and neurosurgical opinion was sought.

OUTCOME AND FOLLOW-UP

The patient and his family members did not agree to neurosurgical interventions. He was treated symptomatically with antispastic medications (conservative management).

DISCUSSION

Clonus is a series of rhythmic involuntary muscular contractions occurring at a frequency of 5–7 Hz in response to an abruptly applied and sustained stretch stimulus.¹ It is induced by the sudden passive stretching of a muscle or tendon and often accompanies the spasticity and hyperactive deep tendon reflexes seen in corticospinal tract disease.² Clonus depends for its elicitation on an appropriate degree of muscle relaxation, integrity of the spinal stretch reflex mechanisms, sustained hyperexcitability of the α -motor neurons and γ -motor neurons (suprasegmental effects) and synchronisation of the contraction–relaxation cycle of muscle spindles.¹ Unsustained clonus fades away after a few beats, sustained clonus persists as long as the examiner continues to hold slight dorsiflexion pressure at the foot.²

Sustained clonus is never normal.² Simpler mechanisms of clonus are alternating stretch reflexes.² It is also hypothesised that clonus results from the action of the central oscillator.^{3 4} Clonus

To cite: Sharma B, Sannegowda RB, Nagpal K, et al. *BMJ Case Reports* Published online: 6 December 2012
doi:10.1136/bcr-2012-006804

Figure 1 Spine MRI revealed cervical compressive myelopathy at the C4–C5 level due to disc dessication with diffuse bulge and canal narrowing with focal myelomalacia of the cord.

is usually elicited at ankle and patella. Clonus of jaw can occur occasionally.² When present, wrist clonus can be mistaken for action-induced tremors.³ However, clonus is a series of rhythmic, monophasic (ie, unidirectional) contractions and relaxations of a group of muscles, differing in this way from tremors, which are always diphasic or bidirectional.¹

Clonus is one of the important clinical signs elicited in neurology. It is the rhythmic muscle contraction which usually occurs in patients with lesions involving descending motor pathways.³ Repetition of this sequence of events induces rhythmic oscillation of some joints, the frequency of which is generally between 5 and 8 Hz.^{1–3} Like other reflexes induced by stretch, clonus occurs with an appropriate degree of increased muscle tone.³ Clonus is usually present in neurological disorders with abnormally increased tendon jerks.⁴ Although not specific to any disease, presence of clonus in association with spasticity and extensor plantar is an important clinical sign suggestive of affection of descending motor pathways. Spasticity is due to lesions involving the corticospinal pathways² and hyperreflexic state that characterises spasticity may take the form of clonus.¹ The aetiology may be compressive myelopathy or non-compressive myelopathy. This may be seen owing to the involvement of cervical spinal cord, brain or brainstem. Clonus is usually elicited at the knee in the form of patellar clonus and at the ankle as ankle clonus.² However, clonus at wrist joint is rare and has not been described much in the literature. Although Pronator clonus, while eliciting pronator catch, may occur owing to severe hypertonus,² only a few case reports have been published with wrist clonus. Sometimes, wrist clonus may be mistaken as action-induced tremor or essential tremors.³

To the best of our knowledge, only a few case reports have been reported so far for wrist clonus. Sung *et al*³ reported a case of cervical schwannoma who presented with action-induced wrist clonus that mimicked action-induced tremors. The patient was misdiagnosed as a case of action-induced tremors elsewhere;

however, neurological examination revealed spasticity in all the four limbs with extensor plantars. Findley *et al*⁵ published a case report of an elderly Parkinson patient with postural and action-induced tremors with cog wheel rigidity who also had a stretch-induced wrist clonus on examination. Our patient was previously diagnosed and treated as action-induced tremors probably because of various reasons. Weakness may be subtle to pick up during the initial phase and, since he was deaf and mute, taking history was really not so easy. May be by the time he presented to us, the weakness was quite obvious as it progressed over the next 5 months until he presented to us.

In our case under discussion, historically, we ruled out hereditary spastic paraparesis, kernicterus at birth and family history of any similar illness. Since wrist clonus is not a commonly encountered sign, we present this case for rarity of this finding which we noticed in a case of compressive myelopathy. Articles with case reports on wrist clonus are very few to the best of our knowledge. The purpose of presenting this case report is to highlight this rare clinical sign which can be mistaken for action-induced tremors. To conclude, proper history and clinical examination is very important in medicine, particularly in neurology, hence every possible attempt should be carried out to elicit it. No matter how difficult it is, history along with proper clinical examination to look into other clinical signs which helps in achieving diagnosis should be sought at the earliest so that proper treatment can be given or intervention can be considered.

Learning points

- ▶ Wrist clonus can be mistaken for action-induced tremors, hence proper history and clinical examination is a must.
- ▶ The underlying cause should be identified such as compressive myelopathy.
- ▶ Although easy to elicit, eliciting wrist clonus is often neglected.

Competing interests None.

Patient consent Obtained.

REFERENCES

- 1 Ropper AH, Samuels MA. *Adams and Victor's principles of neurology*. 9th edn. New York, NY: McGraw Hill, 2009: 52, 97.
- 2 Campbell WW. *Dejong's The neurologic examination*, 6th edn. Philadelphia, PA: Lippincott Williams and Wilkins, 2005:398, 498–9.
- 3 Sung YH, Park KH, Lee YB, *et al*. A case of action-induced clonus that mimicked action tremors and was associated with cervical schwannoma. *J Mov Disord* 2010;3:48–50.
- 4 Dimitrijevic MR, Nathan PW, Sherwood AM. Clonus: the role of central mechanisms. *J Neurol Neurosurg Psychiatry* 1980;43:321–32.
- 5 Findley LJ, Gresty MA, Halmagyi GM. Tremor, the cogwheel phenomenon and clonus in Parkinson's disease. *J Neurol Neurosurg Psychiatry* 1981;44:534–46.

Copyright 2012 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow