EMERGENCY CASEBOOK

Tick paralysis with atypical presentation: isolated, reversible involvement of the upper trunk of brachial plexus

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Emerg Med J 2006;23:e42 (<http://www.emjonline.com/cgi/content/full/23/7/e42>). doi: 10.1136/emj.2006.034835

Tick paralysis is a disease that occurs worldwide. It is a relatively rare but potentially fatal condition. The only way to establish the diagnosis is to carefully search for the tick paralysis. It is caused by a neurotoxin secreted by engorged female ticks. Tick paralysis generally begins in the lower extremities and ascends symmetrically to involve the trunk, upper extremities and head within a few hours. Although early-onset prominent bulbar palsy and isolated facial weakness without generalised paralysis are rare, there is no report in the English literature concerning isolated, reversible involvement of the upper trunk of brachial plexus caused by tick bite. We report a case of isolated, reversible involvement of the upper trunk of brachial plexus as a variant of tick paralysis. Diagnosis was confirmed with needle electromyography and nerve conduction examination. Within 2 weeks, the patient was fully recovered. The purpose of presenting this case is to remind clinicians that tick paralysis should be considered even in cases with atypical neurological findings admitted to the emergency department.

Tick paralysis is a relatively uncommon neurological syndrome that manifests most commonly either as ataxia or acute ascending paralysis. It is caused by a neurotoxin secreted by engorged female ticks.¹ Despite the enormous number of individuals bitten by ticks each year, tick paralysis is a rarely reported disease. Tick paralysis generally affects school-age children. There have, however, been reported cases in adult patients.²⁻³ We present this case to remind clinicians that tick paralysis should be considered even if the findings are atypical.

CASE REPORT

A previously healthy, 66-year-old male farmer presented to the emergency department with acute onset of weakness in his left arm, complaining of numbness for 2 days. His general examination was unremarkable with normal vital signs. Neurological examination demonstrated the following findings:

- being unable to abduct his left upper arm and flex his left elbow
- muscle strength of 3/5 in proximal part and 4/5 in distal part of arm on the left side
- decreased deep tendon reflexes of biceps brachii and brachioradialis on the left arm
- loss of light touch perception over the left C4–C6 dermatomes
- normal cranial nerve examination.

During the physical examination, a single engorged tick, 8 mm in length, was detected in the left supraclavicular area

without the patient's awareness and removed with tweezers. The tick was not identified. Laboratory test results for all the followings were normal: complete blood cell count, erythrocyte sedimentation rate, chemistry profiles and urinalysis. Needle electromyography and nerve conduction examination were performed at admission with the following findings: decreased interference pattern in maximal voluntary contraction of deltoid, biceps brachii and brachioradialis muscles; mildly increased distal motor latency values; and severely decreased amplitude values of motor unit action potentials recorded from deltoid and biceps brachii muscles after stimulation of brachial plexus from Erb point on the left side. All of these are compatible with the partial involvement of the upper trunk of the left brachial plexus (table 1). We ruled out other causes of brachial plexus lesions using plain cervical spine and shoulder radiography and neck and thorax computed tomography scans. Weakness and numbness in the left shoulder and upper arm showed significant recovery and light touch perception and deep tendon reflexes were normal upon neurological examination performed 1 week after admission. The patient subsequently fully recovered and was discharged. Follow-up findings in the needle electromyography and nerve conduction examination performed 15 days after admission were completely normal.

DISCUSSION

Tick paralysis is a disease that occurs worldwide.⁴ It has chiefly been reported from North America, Europe, Asia, South Africa and eastern Australia. It is a relatively rare but potentially fatal condition. Death is caused by respiratory paralysis.⁵ The earliest reference to tick paralysis in humans is from Australia in 1824.³⁻⁵ Forty-three species of ticks have been found to cause tick paralysis.⁶ During sucking, ticks release toxins that block transmitter release from motor nerve terminals.⁷ Weakness typically starts 5–7 days after the tick has become attached.⁴⁻⁸ The paralysis begins in the lower extremities and ascends symmetrically to involve the trunk, upper extremities and head within a few hours.⁸ Although early-onset prominent bulbar palsy and isolated facial weakness without generalised paralysis are rare,²⁻⁵ based on a search of Medline, no report is available in the English literature concerning brachial plexus involvement caused by tick bite. Our patient was therefore unique.

Tick paralysis is more likely to occur in children; the disease is presumed to be less common in adults. Recovery after the removal of a tick is dramatic, within 1 h, with full recovery expected within 24–48 h; but in our case, the complete recovery took 10 days. There are some cases reported where patients took weeks to recover.⁵⁻⁸ Although some patients might complain of sensory symptoms in tick paralysis, sensory abnormalities, which we could not prove electrophysiologically, such as in this case, were rarely reported.¹

The only way to establish the diagnosis was to carefully search for the tick. Ticks paralysis most frequently occurs in

Table 1 Needle electromyography and nerve conduction findings of left arm on admission and day 15

	Denervation activity		Interference pattern		Latency (msec)		Amplitude (mv)	
	Admission	Day 15	Admission	Day 15	Admission	Day 15	Admission	Day 15
Myographic findings								
Deltoid muscle	–	–	Moderately decreased	Full	–	–	–	–
Biceps muscle	–	–	Moderately decreased	Full	–	–	–	–
Brachioradial muscle	–	–	Moderately decreased	Full	–	–	–	–
Neurographical findings								
Erb-deltoid	–	–	–	–	4.9	3.5	0.5	16.3
Erb-biceps	–	–	–	–	5.1	4.0	1.2	10.2

the spring and summer months, but can be seen at any time of year.³ Our patient had a previously unreported occurrence of isolated, reversible involvement of the upper trunk of brachial plexus. The purpose of presenting this case is to remind clinicians that tick paralysis should be considered even in patients with atypical neurological findings who are admitted to the emergency department.

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Accepted for publication 6 February 2006

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