Teaching Video NeuroImages: When the Shoulder Inspires
A Case of Breathing Arm

Jennifer L. McKinney, MD

Neurology® 2021;97:e224. doi:10.1212/WNL.0000000000011755

A 6-month-old girl presented with left arm weakness dating from birth. She had significant elbow flexion and shoulder abduction weakness and mild finger, wrist, and arm extension weakness. EMG/nerve conduction studies were pursued to evaluate extent of injury and demonstrated panplexus injury. Median, lateral antebrachial cutaneous, and radial sensory responses were abnormal, and EMG showed evidence of reinnervation in C5-T1 innervated muscles with ongoing denervation in C5-6 innervated muscles. Spontaneous deltoid firing coincident with inspiration was observed on EMG (video 1). This phenomenon, “breathing arm,” occurs in obstetric and nonobstetric plexopathies when the C5 nerve root is injured proximal to the phrenic nerve origin. In breathing arm, aberrant regeneration of fibers originally supplying the phrenic nerve supplies upper trunk muscles, resulting in synkinesis with contraction of upper trunk muscles with inspiration. An alternative explanation is that this represents a compensatory response to diaphragmatic inadequacy. However, with no clinical evidence of respiratory insufficiency, aberrant reinnervation is favored. Respiratory synkinesis is significant when considering surgery as this indicates severe proximal root or trunk injury.1,2

Study Funding
No targeted funding reported.

Disclosure
J.L. McKinney reports no disclosures relevant to the manuscript. Go to Neurology.org/N for full disclosures.

Appendix

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jennifer L.</td>
<td>Nationwide Children's Hospital/The Ohio State</td>
<td>Designed and conceptualized study, drafted and edited the manuscript</td>
</tr>
<tr>
<td>McKinney, MD</td>
<td>University College of Medicine</td>
<td></td>
</tr>
</tbody>
</table>

References

From the Division of Neurology, Nationwide Children's Hospital; and Department of Clinical Pediatrics, Section of Neurology, The Ohio State University, Columbus. Go to Neurology.org/N for full disclosures.
Teaching Video NeuroImages: When the Shoulder Inspires: A Case of Breathing Arm
Jennifer L. McKinney
Neurology 2021;97:e224 Published Online before print February 26, 2021
DOI 10.1212/WNL.00000000000011755

This information is current as of February 26, 2021

Updated Information & Services
including high resolution figures, can be found at:
http://n.neurology.org/content/97/2/e224.full

References
This article cites 2 articles, 1 of which you can access for free at:
http://n.neurology.org/content/97/2/e224.full#ref-list-1

Subspecialty Collections
This article, along with others on similar topics, appears in the following collection(s):
EMG
http://n.neurology.org/cgi/collection/emg

Permissions & Licensing
Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
http://www.neurology.org/about/about_the_journal#permissions

Reprints
Information about ordering reprints can be found online:
http://n.neurology.org/subscribers/advertise