

# Teaching Video NeuroImages: When the Shoulder Inspires

## A Case of Breathing Arm

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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.<sup>1,2</sup>

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### Disclosure

J.L. McKinney reports no disclosures relevant to the manuscript. Go to [Neurology.org/N](https://Neurology.org/N) for full disclosures.

### Appendix Author

Name	Location	Contribution
Jennifer L. McKinney, MD	Nationwide Children's Hospital/The Ohio State University College of Medicine	Designed and conceptualized study, drafted and edited the manuscript

### References

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