

**Are your MRI contrast agents cost-effective?**

Learn more about generic Gadolinium-Based Contrast Agents.



**FRESENIUS  
KABI**

caring for life

# AJNR

## **Trigeminal sensory neuropathy caused by cervical disk herniation.**

J A Barakos, P G D'Amour, W P Dillon and T H Newton

*AJNR Am J Neuroradiol* 1990, 11 (3) 609

<http://www.ajnr.org/content/11/3/609.citation>

This information is current as  
of April 15, 2024.

# Trigeminal Sensory Neuropathy Caused by Cervical Disk Herniation

Trigeminal sensory neuropathy may result from a wide variety of factors, including tumors of the trigeminal ganglion or spinal trigeminal tract, demyelinating diseases, and connective tissue disorders. Despite a long list of possibilities, the cause often is difficult to establish, and thus many cases are described as idiopathic. We report an unusual case of trigeminal sensory neuropathy caused by cervical disk herniation.

## Case Report

A 33-year-old woman had had right-sided facial numbness, mild neck pain, and paresthesias of her right arm and leg for 2 weeks. She said that the symptoms had started suddenly but denied recent history of trauma. She had had trauma to her neck in a motor vehicle accident 2 years before. Neurologic examination revealed loss of sensation, including pain, temperature, and touch, on the right side of the face and forehead. Corneal sensation and corneal reflex were normal. Plain radiographs of the neck were interpreted as normal. The patient was referred to our institution for further evaluation. Head CT scans were normal. MR imaging showed disk herniation at the C3–C4 level with marked compression of the spinal cord (Fig. 1). A large disk fragment protruding through the posterior longitudinal ligament was removed surgically. The patient experienced immediate, complete resolution of the trigeminal sensory loss.

## Discussion

Differential diagnosis of trigeminal sensory neuropathy is challenging because this disorder has a wide variety of causes. It has been reported in association with a variety of connective tissue diseases, including systemic lupus erythematosus, dermatomyositis, and mixed connective tissue disease [1–5], but most frequently with systemic sclerosis [6, 7]. It has been hypothesized that the association with connective tissue diseases is the result of either disturbed autoimmunity or vasculitis [6, 8, 9]. Other documented causes include trauma, tumors, and viral inflammation of the gasserian ganglion, the sensory root, or the spinal trigeminal nucleus [10–16].

In our case, the trigeminal sensory neuropathy was the result of a cervical disk impinging the spinal trigeminal tract. The spinal trigeminal tract is formed by the fibers of the trigeminal sensory root, which turn caudally on entering the pons and extend into the upper cervical spine (Fig. 2). As the spinal tract descends, it gives off fibers to the spinal trigeminal nucleus, which also descends into the upper cervical spinal cord. The spinal trigeminal nucleus transmits pain, temperature, and some tactile sensation from the face in a somatotopic orientation. Most authors describe the trigeminal tract and nucleus as extending to approximately the second to fourth cervical level [17, 18]. As a result, a tumor or lesion of the lateral medulla or upper cervical spinal cord in the region of the spinal trigeminal tract or nucleus may cause trigeminal sensory neuropathy. The preservation of corneal sensation and reflex, as in our case, is characteristic of lesions of the spinal trigeminal tract and may occur in patients with trigeminal tractotomies [19, 20] and in trigeminal sensory neuropathy [21].

Jerome A. Barakos

Peter G. D'Amour

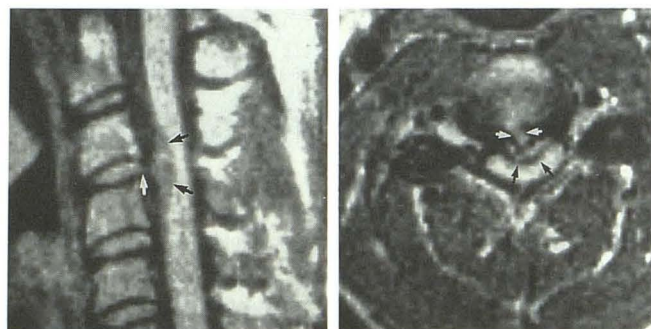
William P. Dillon

T. Hans Newton

University of California, San Francisco  
San Francisco, CA 94143-0628

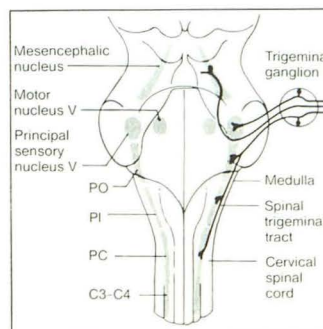
## REFERENCES

1. Ashworth B, Tait GBW. Trigeminal neuropathy in connective tissue disease. *Neurology* 1971;21:609–614
2. Searles RP, Mladinich EK, Messner RP. Isolated trigeminal sensory neuropathy: early manifestation of mixed connective tissue disease. *Neurology* 1978;28:1286–1289
3. Lundberg PO, Werner I. Trigeminal sensory neuropathy in systemic lupus erythematosus. *Acta Neurol Scand* 1972;48:330–340
4. Bennett RM, Bong DM, Spargo BH. Neuropsychiatric problems in mixed connective tissue disease. *Am J Med* 1978;65:955–962
5. Vincent FM, Van Houzen RN. Trigeminal sensory neuropathy and bilateral carpal tunnel syndrome: the initial manifestation of mixed connective tissue disease. *J Neurol Neurosurg Psychiatry* 1980;43:458–460
6. Teasdale RD, Frayha RA, Shulman LE. Cranial nerve involvement in systemic sclerosis (scleroderma): a report of 10 cases. *Medicine (Baltimore)* 1980;59:149–159
7. Farrell DA, Medsger TA. Trigeminal neuropathy in progressive systemic sclerosis. *Am J Med* 1982;73:57–62
8. Lecky BRF, Hughes RAC, Murray NMF. Trigeminal sensory neuropathy: a study of 22 cases. *Brain* 1987;110:1463–1485
9. Kaltrider HB, Talal N. The neuropathy of Sjogren's syndrome: trigeminal nerve involvement. *Ann Intern Med* 1969;70(4):751–762
10. Goldstein NP, Gibilisco JA, Rushton JG. Trigeminal neuropathy and neuritis. *JAMA* 1963;184(6):458–462
11. Jefferson G. The trigeminal neurinomas: with some remarks on malignant invasion of the gasserian ganglion. *Clin Neurosurg* 1955;1:11–54
12. Cuneo HM, Rand CW. Tumors of the gasserian ganglion. *Neurosurgery* 1952;9:423–435
13. Walton J. *Brain's diseases of the nervous system*, 9th ed. Oxford, England: Oxford University Press, 1985:110–112
14. Croen KD, Ostrove JM, Dragovic LJ, Smialek JE, Straus SE. Latent herpes simplex virus in human trigeminal ganglia. *N Engl J Med* 1987;317:1427–1432
15. Vafai A, Murray RS, Wellish M, Delvin M, Gilden DH. Expression of varicella-zoster virus and herpes simplex in normal human trigeminal ganglia. *Proc Natl Acad Sci USA* 1988;85:2362–2366
16. Tien RD, Dillon WP. Herpes trigeminal neuritis and rhombencephalitis: enhancement with Gd-DTPA MR. *AJNR* (in press)
17. Brazis PW, Masdeu JC, Biller J. *Localization in clinical neurology*. Boston: Little, Brown, 1985:159–170
18. Barr ML, Kiernan JA. *The human nervous system*, 4th ed. New York: Harper & Row, 1983:126–129
19. Walker AE. Anatomy, physiology, and surgical considerations of the spinal tract of the trigeminal nerve. *J Neurophysiol* 1939;2:234–248
20. Weinberger LM, Grant FC. Experiences with intramedullary tractotomy: studies in sensation. *Arch Neurol Psychiatry* 1942;48:355–381
21. Blau JN, Harris M, Kennett S. Trigeminal sensory neuropathy. *N Engl J Med* 1969;281(16):873–876



1A

1B



2

Fig. 1.—A and B, Sagittal, 500/40, (A) and transaxial, 1000/40, (B) MR images of cervical spine show herniated disk at C3–C4 level (white arrows) and marked compression of cervical spine (black arrows).

Fig. 2.—Schematic dorsal view of brainstem shows sensory fibers and nuclei of trigeminal nerve. Both spinal trigeminal tract and nucleus extend into upper cervical spinal cord. Subnuclei of spinal trigeminal nucleus include pars oralis (PO), pars interpolaris (PI), and pars caudalis (PC).