

Case Report

Intractable hiccups and neck pain due to left C4 radiculopathy decreased with posterior foraminotomy

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ABSTRACT

Background: Intractable hiccups can last for more than 1–2 months and can occur, as shown in this case study, due to cervical nerve root compression.

Case Description: A 76-year-old male presented with intractable hiccups and neck pain of 7 months' duration. The patient underwent magnetic resonance imaging studies of the entire neuraxis. The only abnormality found was on the cervical magnetic resonance images that demonstrated left C4 nerve root compression due to the C3–C4 lateral/foraminal osteophyte. Following a left-sided C3–C4 laminoforaminotomy, the hiccups and the neck pain improved.

Conclusion: A 76-year-old male presented with intractable hiccups and neck pain attributed to a left C3/C4 lateral/foraminal spondylotic ridge. Following a left C3–C4 laminoforaminotomy, the frequency of hiccup attacks remained the same, but their duration was markedly shortened to 30 s, while the neck pain improved.

Keywords: C4 nerve root, Intractable hiccups, Laminoforaminotomy, Neck pain, Radiculopathy

INTRODUCTION

Persistent hiccups and intractable hiccups are, respectively, defined based on their duration: more than 24–48 h and more than 1–2 months.^[2,3,5,9] The etiology of intractable hiccups includes: psychogenetic disorders, infection, trauma, medications, congenital anomalies, stroke, vascular malformations, demyelinating diseases, familial background, and iatrogenic conditions.^[1-5,8] Additional causative lesions for intractable hiccups involve the thoracic spine, mediastinum, abdomen, or neural tracts extending from the cerebral cortex to the lumbar spine.^[2-4,8] Here, a 76-year-old male with intractable hiccups and neck pain underwent a left-sided C3–C4 laminoforaminotomy to remove an osteophyte resulting in focal C4 root compression.

CASE PRESENTATION

A 76-year-old male presented neurologically intact, but with neck pain of 9 months duration, and 7 months of intractable hiccups. Notably, the hiccup attacks occurred 20–80 times/day, each lasting approximately 15 min. Upper endoscopy and abdominal computed tomography studies were negative. The patient underwent magnetic resonance imaging (MRI) studies of the entire neuraxis. When the cervical MRI revealed left C4 foraminal nerve root-osteophytic compression,

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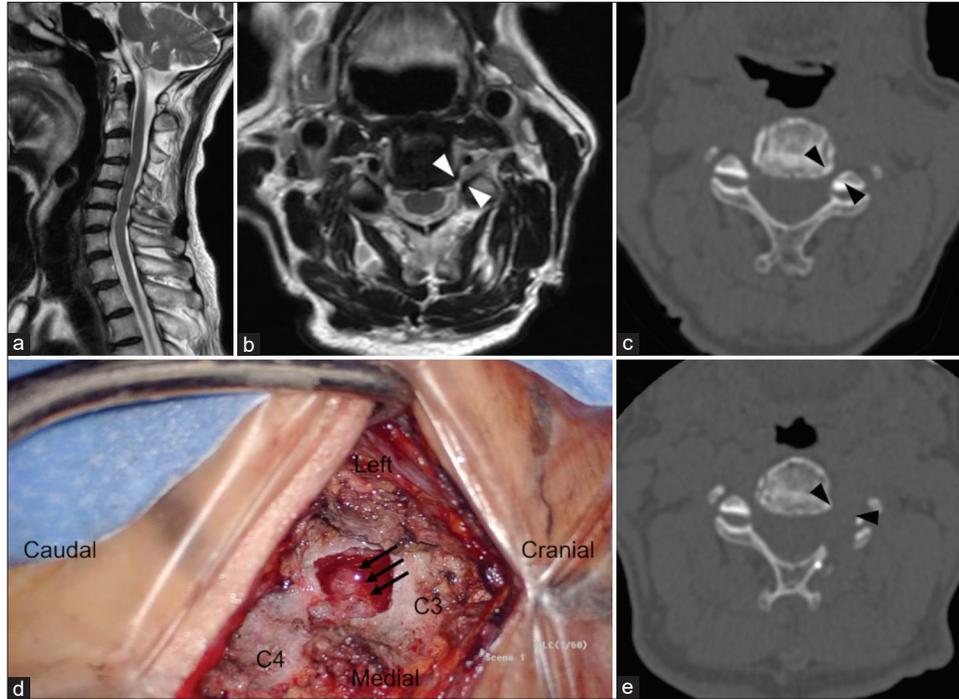


Figure 1: (a) Preoperative sagittal magnetic resonance image (MRI). Apparent cervical spinal cord stenosis is not observed. (b) An axial MRI at the level of the bilateral C4 nerve roots. Left foramen stenosis of the C4 nerve root is visible (white arrow heads). (c) A computed tomography image showing osteophytes causing left foramen stenosis of the C4 nerve root. The ventral and dorsal roots of C4 are compressed (black arrow heads). (d) The left C4 nerve root is posteriorly decompressed (triple arrows). (e) A postoperative computed tomography image showing release of the left C4 nerve root (black arrow heads).

Table 1: Summary of literature on past cases of intractable hiccups.

Author ^[Reference]	Patients (age/sex)	Etiology	Management
Abbasi <i>et al.</i> ^[1]	8 Patients	Post-interventional pain procedure	Non-pharmacologic treatments with/without medications (chlorpromazine, triamcinolone, or metoclopramide)
Al Deeb <i>et al.</i> ^[2]	4 Patients		
	55 (y) M	Medullary tuberculoma	Antituberculosis medication
	65 (y) M	Infarction of the pons, cerebellum and medulla oblongata	Medication (Clonazepam)
Amirjamshidi <i>et al.</i> ^[3]	45 (y) M	Glioma or tuberculoma of the inferior part of the vermis	Antituberculosis medication
	24 (y) M	Tuberculoma of the medulla oblongata	Antituberculosis medication
	4 Patients		
	19 (y) M	Type I Arnold-Chiari malformation	Foramen magnum decompression, C1 laminectomy, tonsillectomy, and dural expansion
	35 (y) M	Ependymoma in the fourth ventricle	Subtotal removal of the tumor and dural expansion
Loft and Ward ^[4]	16 (y) M	A unruptured distal PICA aneurysm	Excision of the aneurysm
	21 (y) M	Type I Arnold-Chiari malformation	Posterior fossa decompression medication
Nagayama <i>et al.</i> ^[5]	19 (y) M	Type I Arnold-Chiari malformation	Ventriculoperitoneal shunt
	35 (y) M	Cervicothoracic syringomyelia	
Sweeney <i>et al.</i> ^[8]	52 (y) F	Cerebellar hemangioblastoma	Surgical removal
	46 (y) F	Brain abscess of the basal ganglia	Stereotactic aspiration and antibiotics
Thaci <i>et al.</i> ^[9]	36 (y) F	Hemorrhage from a cavernous malformation of the medulla oblongata	Surgical dissection

PICA: Posterior inferior cerebellar artery, y: Years old, F: Female, M: Male

left C3–C4 laminoforaminotomy was performed [Figure 1a-e]. Postoperatively, the frequency of the hiccups remained the same, but the attacks were shortened to 30 s at most, and the neck pain improved.

DISCUSSION

Lesions that continuously irritate the afferent, central, and efferent pathways of the hiccup reflex may result in intractable hiccups [Table 1].^[1-5,8,9] The afferent root receives ascending visceral and somatic sensory stimuli through the vagus nerve, phrenic nerve, and sympathetic neural branches of the T6-T12 nerve roots. Central modulation involves the cervical C3-C5 nerve roots, and the dorsolateral medulla. Descending hiccup modulation is regulated by the hypothalamus, reticular activating system, subthalamic nuclei, and the temporal lobe. Further, the phrenic nerve, the major efferent pathway of the hiccup reflex, is primarily composed of the ventral root of the C4 nerve.^[6,7] Here, a 76-year-old male's intractable hiccups and posterior neck pain were attributed to a left C3–C4 osteophyte/C4 radiculopathy, and markedly improved following a C3–C4 laminoforaminotomy.

CONCLUSION

A 76-year-old male with intractable hiccups/neck pain attributed to a left C4 root compression/C3–C4 osteophyte formation, experienced marked improvement in his hiccups (i.e., attacks markedly shortened to 30 s), and radiculopathy following a left C3–C4 laminoforaminotomy.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Abbasi A, Roque-Dang CM, Malhotra G. Persistent hiccups after interventional pain procedures: A case series and review. *PM R* 2012;4:144-51.
2. Al Deeb SM, Sharif H, Al Moutaery K, Biary N. Intractable hiccup induced by brainstem lesion. *J Neurol Sci* 1991;103:144-50.
3. Amirjamshidi A, Abbassioun K, Parsa K. Hiccup and neurosurgeons: A report of 4 rare dorsal medullary compressive pathologies and review of the literature. *Surg Neurol* 2007;67:395-402; discussion 402.
4. Loft LM, Ward RF. Hiccups. A case presentation and etiologic review. *Arch Otolaryngol Head Neck Surg* 1992;118:1115-9.
5. Nagayama T, Kaji M, Hirano H, Niuro M, Kuratsu J. Intractable hiccups as a presenting symptom of cerebellar hemangioblastoma. Case report. *J Neurosurg* 2004;100:1107-10.
6. Padmanaban V, Payne R, Corbani K, Corl S, Rizk EB. Phrenic nerve stimulator placement via the cervical approach: Technique and anatomic considerations. *Oper Neurosurg* 2021;21:E215-20.
7. Prates AG Jr, Vasques LC, Bordoni LS. Anatomical variations of the phrenic nerve: An actualized review. *J Morphol Sci* 2015;32:53-6.
8. Sweeney J, Bodman A, Hall WA. Brain abscess of basal ganglia presenting with persistent hiccups. *World Neurosurg* 2018;112:182-5.
9. Thaci B, Burns JD, Delalle I, Vu T, Davies KG. Intractable hiccups resolved after resection of a cavernous malformation of the medulla oblongata. *Clin Neurol Neurosurg* 2013;115:2247-50.

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