



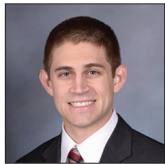
Case Report

Transient internuclear ophthalmoplegia following anterior cervical discectomy and fusion

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ABSTRACT

Background: Internuclear ophthalmoplegia (INO), characterized by impaired horizontal eye movement, occurred following an anterior cervical discectomy/fusions (ACDF).

Case Description: A 48-year-old female with recurrent C5-6 foraminal stenosis presented with right C6 radiculopathy. She underwent a C5-6 ACDF, but postoperatively, complained of diplopia. Her examination revealed left-eye INO. Notably, the brain magnetic resonance imaging showed no significant radiological findings. The patient's diplopia and INO resolved spontaneously on postoperative day 2 and never recurred.

Conclusion: Ocular complications following anterior cervical spine procedures are rare. Here, a 48-year-old female developed left eye INO following an ACDF that spontaneously resolved on postoperative day 2.

Keywords: Anterior cervical discectomy and fusion, internuclear ophthalmoplegia, Medial longitudinal fasciculus, INO

INTRODUCTION

Ocular/visual complications following anterior cervical discectomy/fusions (ACDF) are rare. Gabel *et al.*, in a retrospective and multi-center study of over 17,000 cervical spine surgeries, found no cases of postoperative blindness or vision loss.^[4] If visual loss occurs during spine surgery, it is usually attributed to ischemic optic neuropathy, central retinal artery occlusion, cortical blindness secondary to infarction, demyelinating disease, trauma, infection, tentorial herniation, tumor, or hemorrhage. Here, a 48-year-old female presented with internuclear ophthalmoplegia (INO), a gaze abnormality characterized by impaired horizontal eye movement, following an uncomplicated ACDF.

CASE DESCRIPTION

A 48-year-old female following a prior C5-6 posterior cervical endoscopic foraminotomy presented with recurrent right arm pain and diminished sensation in the right C6 dermatome, plus a positive Spurling maneuver. Cervical magnetic resonance imaging (MRI) demonstrated persistent right C5-6 foraminal stenosis and lateral disc protrusion [Figure 1]. She underwent a C5-C6 ACDF performed under microscope visualization. The procedure was uneventful. On waking from anesthesia, she complained of diplopia when both eyes were opened; she denied diplopia when

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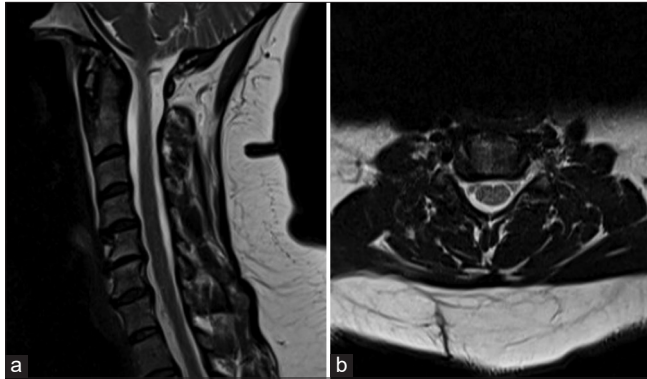


Figure 1: Preoperative T2 sagittal cervical spine magnetic resonance imaging (MRI) (panel a) and T2 axial cervical spine MRI (panel b) at the C5-6 level demonstrating right C5-6 foraminal stenosis due to a lateral protrusion of the C5-6 disc.

closing her left or right eye, respectively. Physical examination revealed INO affecting the left eye as she was unable to medially adduct the left eye. Brain MRI, as well as magnetic resonance venography (MRV) and magnetic resonance angiography (MRA), was negative [Figure 2]. On postoperative day 1, the patient noted improved diplopia and no longer had evidence of INO affecting her left eye; the diplopia was completely resolved on postoperative day 2 and never recurred on the 1-year follow-up.

DISCUSSION

Ocular complications following cervical spine surgery are exceedingly rare. There are only a handful of cases in the literature describing diplopia in patients following spine surgery, let alone cervical spine surgery [Table 1].^[1-3,5-10] We

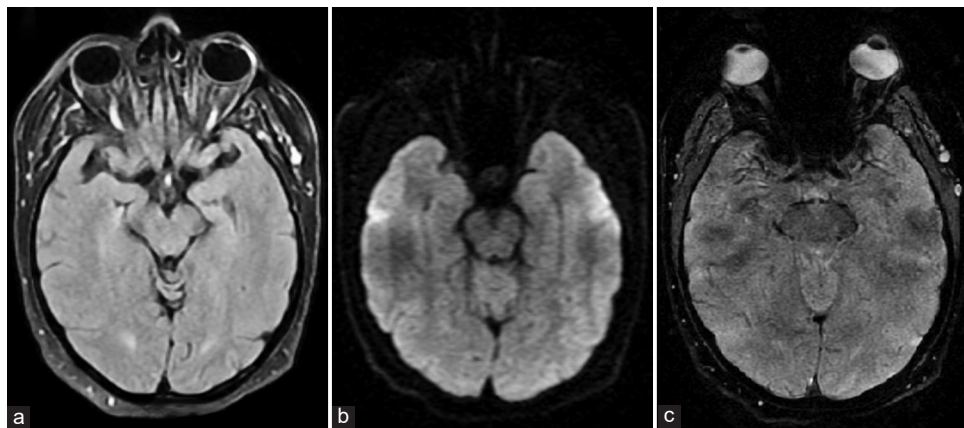


Figure 2: Postoperative T2 FLAIR axial brain magnetic resonance imaging (MRI) (panel a), DWI axial brain MRI (panel b), and SWI axial brain MRI (panel c) sequences demonstrating no structural, demyelinating, infarct, or hemorrhagic etiology of the patient's transient internuclear ophthalmoplegia.

Table 1: Literature review detailing reported cases of diplopia following spine surgery.

Case report (s)	Surgical procedure	Proposed etiology of diplopia	Magnetic resonance imaging brain finding (s)
Barsoum <i>et al.</i> , 1999 ^[2]	L3-L5 decompression revision and L2-L5 fusion	Cranial Nerve VI Traction	N/A
Nakagawa <i>et al.</i> , 2003 ^[8]	Resection of spinal tumor at C1-C2	Mechanical stress due to spinal cord decompression and CSF leak	Unremarkable
Cho <i>et al.</i> , 2009 ^[3]	L4-5 and L5-S1 posterior fusion	CSF leak	Unremarkable
Abd-Elseyed <i>et al.</i> , 2011 ^[1]	Four cases: two posterior fusions, one anterior fusion, and one ACDF	For all cases: facial edema, facial traction, and CSF leak	N/A
Thomas <i>et al.</i> , 2011 ^[10]	L4-L5 discectomy	CSF leak	Unremarkable
Joo <i>et al.</i> , 2013 ^[5]	L5-S1 discectomy	CSF leak	N/A
Khurana <i>et al.</i> , 2013 ^[6]	Two cases: T9-T10 discectomy and thoracotomy with T8 hemivertebrectomy	CSF leak	Bilateral subdural effusions
Sandon <i>et al.</i> , 2016 ^[9]	T6-7 discectomy followed by revision surgery – laminectomy of T6/T7/T8 and T5-T8 fusion	CSF leak	Bilateral subdural effusions
Kim <i>et al.</i> , 2021 ^[7]	C1-C2 fusion	Cranial nerve VI traction	Unremarkable

ACDF: Anterior cervical discectomy and fusion, CSF: Cerebrospinal fluid, N/A: Not applicable

were unable to identify any prior reports of INO occurring following an ACDF. Although microemboli and/or vasospasm of the small basilar perforating arteries that supply the MLF may play a potential role for a patient to develop INO, our patient's MR, MRA, and MRV were all negative making these etiologies unlikely. Further, the patient did not appear to have multiple sclerosis, neuromyelitis optica, a brainstem and/or fourth ventricular tumor, a CNS infection, and/or trauma. Therefore, for our patient, with an uneventful intraoperative course, the most likely etiology of her transient INO is "idiopathic."

CONCLUSION

Here, we present a 48-year-old female who developed transient 1–2-day onset of a left-eye INO following a routine C5-C6 ACDF.

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.

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