

I think I have double vision? Or not? Internuclear Ophthalmoplegia following right lacunar infarct

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SUMMARY

Internuclear Ophthalmoplegia (INO) is an inability of the ipsilateral adduction with a contralateral horizontal abducting saccade on attempted gaze to the contra-lesion side. Injury to the medial longitudinal fasciculus (MLF) will obstruct the signalling pathway between the ipsilateral abducens nucleus and the contralateral medial rectus muscle. Infarction accounts for 38% of INO cases with mostly being unilateral (87%), followed by demyelination (34%), which mostly being bilateral (73%). Lacunar infarct is the most common ischemic stroke. INO can be easily missed due to its subtle presentation with no complaints from the patients. A full cranial nerves assessment, includes the extraocular muscles movement, is important. Ischemic and demyelinating INO typically recover. We present here of a case of INO following right lacunar infarct in a 72-year-old Malay woman. She had hypertensive crisis due to missed medications. Her blood pressure was well controlled throughout the hospital admission and finally she was discharged home with continuation of care at her primary facility.

INTRODUCTION

Internuclear ophthalmoplegia (INO) is a supranuclear eye movement disorder, characterized by the disorder in horizontal gazes. In the older patients, stroke is a common aetiology. Less common causes are traumatic, neoplastic, inflammatory or infectious aetiology. INO presents with an ipsilateral adduction deficit (partial or complete) with a contralateral, dissociated, horizontal abducting saccade on attempted gaze to the contra-lesional side.

CASE REPORT

A 72-year-old Malay woman presented to the Emergency Department (ED) of University Malaya Medical Centre (UMMC) with sudden onset of slurred speech, left sided body weakness and right sided facial asymmetry. Prior to this, she missed her antihypertensive medications for 4 days as she was travelling to another state in Malaysia. On arrival at the ED her blood pressure was 202/100mmHg, with reduced strength of her left lower limb. She noticed that she occasionally had double vision. Her daughter noted that the patient occasionally had some 'weird' movements of the eyes. Otherwise, she had no other ocular symptoms.

Her vision on the unaided Snellen was 6/24, pinhole 6/9. Both eyes were orthophoric. No ptosis noted (Figure 1A). On the extraocular movement examination, full dextroversion

was seen (Figure 1B). However, limitations were noted on adduction of her right eye with left eye showed saccades on levoersion (Figure 1C). Convergence is preserved (Figure 1D). Confrontational visual field was normal on both eyes. The other ocular examinations were normal.

The patient was restarted on her antihypertensives and being put on ambulatory blood pressure monitoring. She was referred to our neuromedical team and underwent physiotherapy. Finally she was discharged home with continuation of care at her primary facility.

DISCUSSION

INO is an inability of the ipsilateral adduction with a contralateral horizontal abducting saccade on attempted gaze to the contra-lesion side.¹ According to the Herring's law of equal innervation, increased innervation to the underacting adducting muscle, results in an enhanced stimulus to the contralateral abducting muscle.²

INO is caused by damage to the interneuron between the two nuclei of cranial nerves VI and III. This interneuron is called the medial longitudinal fasciculus (MLF). The higher cortical centres such as the frontal eye field, occipital and parietal lobes send signals to the paramedian pontine reticular formation (PPRF). It further relays the information to the ipsilateral abducens nucleus (CN VI). The nuclei will send the signal through the MLF to the contralateral medial rectus muscle. The activation of the ipsilateral lateral rectus and contralateral medial rectus produces a horizontal conjugate movement. INO is named by the side of the adduction deficit, which is ipsilateral to the MLF lesion. Causes of damage are due to such as demyelinating, ischemic, neoplastic and inflammatory in the pons or midbrain. An ischemic INO is due to the ischemia in the vertebrobasilar system, which is supplied by branches of the basilar artery. Infarction accounts of 38% of INO cases, most of these are unilateral (87%). Demyelination is 34% and most of them (73%) are bilateral.³

The diagnosis is made clinically with the conjugate movements. From the computed tomography (CT) scan or Magnetic Resonance Imaging (MRI), the site of damage can be assessed. The prognosis of INO depends on its aetiology. Ischemic and demyelinating INO usually recover.

Lacunar infarct is the most common ischemic stroke, resulting from the occlusion of the small deep penetrating arteries that arise directly from Circle of Willis, cerebellar

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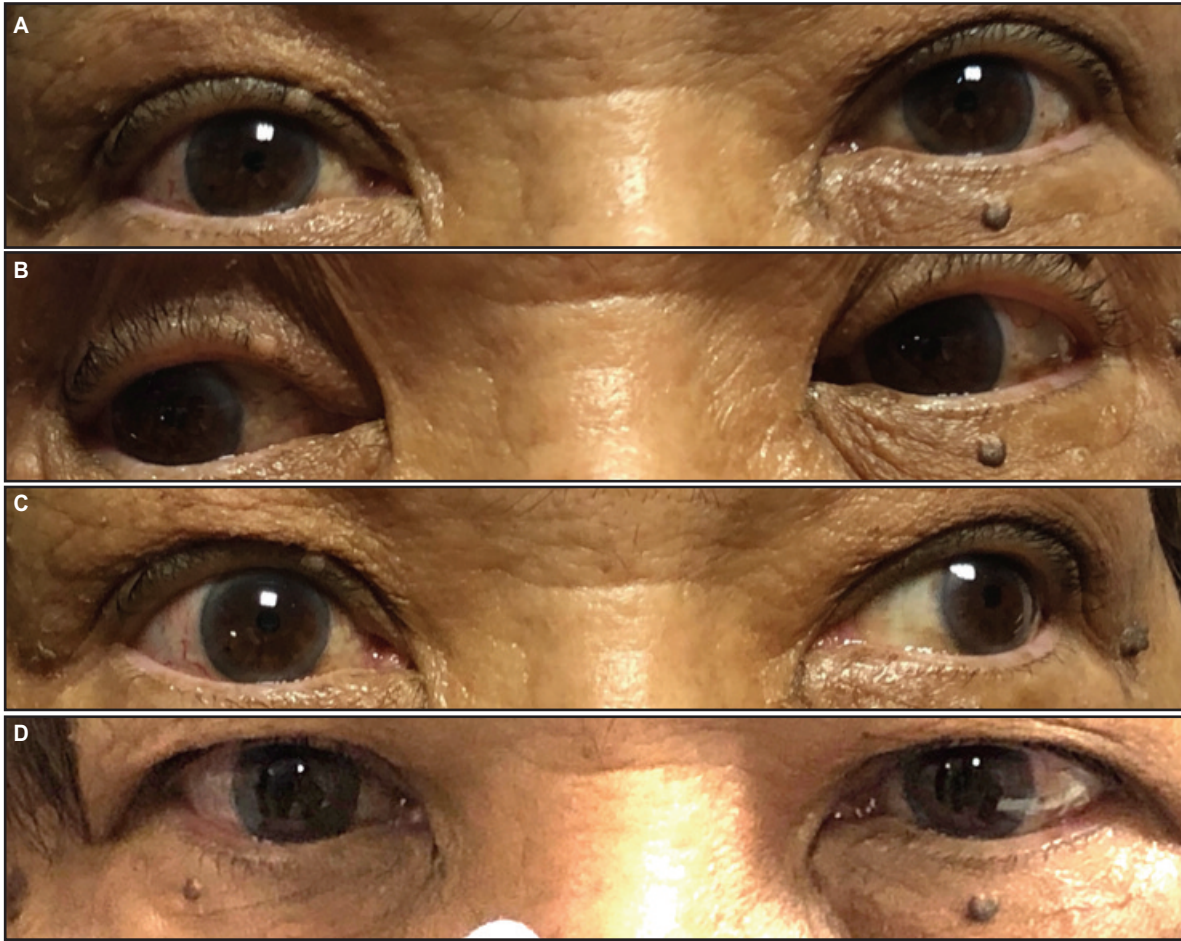


Fig. 1: Extraocular movement examination. A: A general appearance of the eyes were orthophoric and no ptosis, B: Full range of dextroversion, C: Limited levoversion of the right eye, D: Both eyes were able to adduct in the convergence test.

arteries and basilar artery. In the lacunar strokes, true cortical signs such as aphasia, visuospatial neglect, gaze deviation and visual field defects. Five classical lacunar syndromes are described: pure motor stroke, ataxic hemiparesis, dysarthria, pure sensory stroke, and mixed sensorimotor stroke.⁴ Two proposed occlusive mechanisms are microatheroma and lipohyalinosis. An embolic cause is assumed, if no evidence of small vessel disease was found. Advanced age, chronic hypertension, smoking, diabetes mellitus and hypercholesterolemia are risk factors. In a study done by Linxin et al., the maximum BP in the 5 years before the stroke event, was higher in patients with lacunar events.⁵

Short-term high dose of aspirin can be given within 48 hours. For long term prevention of recurrence, the risk factors such as hypertension, and diabetes mellitus should be kept well controlled. Rehabilitation after stroke can be done through occupational therapy, speech therapy and physical therapy interventions. Family support plays an equal vital role in rehabilitation of INO patients.

CONCLUSION

INO can be easily missed during the acute presentation, with the subtle symptoms and signs. A full cranial nerves assessment, including the extraocular muscle movements,

should be included. Lacunar stroke is the most common ischemic stroke, which has a high association in unilateral INO cases.

DECLARATION OF CONFLICTING INTEREST

The authors declared no potential conflicts of interest with respect to the authorship and/or publication to this article.

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