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Unilateral foot drop

Rahul Lath, Vedantam Rajshekhar

A 56-year-old man had presented with a right foot drop which developed over a one-month period, six months prior to admission in our department. There was no weakness of the left upper or lower limbs. He had three episodes of transient numbness over the right lower limb, one and a half years earlier which lasted for 10 minutes each. There was no history of low back ache or features of raised intracranial pressure. Bowel and bladder functions were normal. One month after the onset of the foot drop he was evaluated elsewhere and a diagnosis of L4 L5 intervertebral disc prolapse was made after a lumbar myelogram. He underwent a lumbar laminectomy and L4 L5 discectomy. Postoperatively there was no improvement and the weakness worsened. A postoperative magnetic resonance imaging (MRI) scan of the lumbar spine showed postoperative changes of the laminectomy and L4 L5 discectomy with no other pathology.

Physical examination revealed normal fundii and normal and symmetrical facial movements. There were no motor or sensory deficits in the upper limbs and left lower limb. There was grade 5/5 power in the muscles of the right hip and knee joints while the power in the right ankle dorsiflexors was grade 3/5 and right toes was grade 1/5. The tone was normal in all the limbs and there was no atrophy or fasciculations in the upper or lower limbs. There was impairment of the parieto-cortical sensations over the dorsal and plantar aspect of the right foot. The knee and ankle jerks were exaggerated on the right side but there was no clonus. Superficial abdominal reflexes were absent on the right and the right plantar response was extensor. He had a steppage gait with a foot drop on the right side. Straight leg raising test was negative.

Questions

- 1 Name four causes of a unilateral foot drop.

2 What is the most likely diagnosis in this patient?

3 What further investigation would you undertake in this patient?

Department of
Neurological Sciences,
Christian Medical
College and Hospital,
Vellore, Tamil Nadu-
632004, India
R Lath
V Rajshekhar

Correspondence to
Dr Vedantam Rajshekhar

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Answers

QUESTION 1
Possible causes of foot drop are listed in box 1.

QUESTION 2
In the presence of hyperreflexia, upgoing plantar response, impaired parietocortical sensations and distal weakness of the right lower limb, the most likely diagnosis is a lesion in the left parasagittal region. The absence of atrophy, fasciculations and negative straight leg raising test point to a central cause of the foot drop. The differential diagnosis would include left middle third parasagittal meningioma, low-grade glioma involving the posterior frontal region, and an infective granuloma such as a tuberculoma.

QUESTION 3
When a parasagittal lesion is suspected the diagnostic investigation of choice is a computed tomography (CT) scan or MRI scan of the brain. A CT scan of this patient (figure) showed a contrast enhancing mass in the left middle third parasagittal region. He underwent a left fronto-parietal craniotomy and total excision of the tumour. The biopsy was reported as angiomatous meningioma.

Discussion

Diagnosis of a cerebral lesion may have been difficult at initial presentation of our patient because the weakness was restricted to the right ankle and toes and the sensory deficit was minimal. Only careful examination subsequently revealed impaired parieto-cortical sensations over a restricted area in the right foot. Moreover, the sensory seizures may have been attributed to paraesthesias associated with a radiculopathy. In the absence of features of raised intracranial pressure, an intracranial lesion was probably not considered.

Lumbar myelograms and even CT/MRI scans of normal individuals can show mild anterior indentations of the dural sac caused by bulges of the intervertebral discs and these must be differentiated from pathological disc herniation.^{1,2} Clinical data must be integrated

Figure Contrast CT scan of the brain showing the parasagittal meningioma

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Foot drop: causes
<ul style="list-style-type: none">• lesions of the common peroneal or deep peroneal nerve• injuries to the lumbar plexus and lateral half of the sciatic nerve• cauda equina lesions (eg, lumbar disc prolapse)• lesions of L4 to S1 spinal segments• poliomyelitis• progressive muscular atrophy• amyotrophic lateral sclerosis• Charcot Marie Tooth disease• peripheral neuritis• supratentorial causes (parasagittal lesions)

Box 1

Signs pointing to supratentorial lesion as the cause of foot drop
<ul style="list-style-type: none">• exaggerated deep tendon reflexes• diminished or absent ipsilateral superficial reflexes• spasticity• extensor plantar response• impairment of parieto-cortical sensations• absence of atrophy

Box 2

with imaging findings before concluding that the indentation is abnormal.

Approximately 50% of parasagittal and falx meningiomas occur in the middle parasagittal region between the coronal and lambdoid sutures. About 80% of patients with these tumours present with contralateral focal motor or sensory seizures usually involving the leg. In time, this is followed by a contralateral lower extremity weakness. Some patients present with spastic foot drop.³ There are various difficulties in recognising the central origin of a monoplegia. It is an easy matter when the paralysis of the leg or arm is accompanied by an increase in tone, brisk tendon reflexes, and extensor plantar response but it can be very difficult to recognise a central lesion when it appears to follow the distribution of peripheral nerves or roots.⁴ In the lower limb the motor deficit may be confined to the muscles of the toes and dorsiflexors of the foot and may spare the thigh and hip completely, thus simulating an external peroneal palsy.⁴ In general, the presence or absence of atrophy of muscles in a monoplegic limb is of particular diagnostic help. Monoplegia without atrophy is most often due to a lesion of the cerebral cortex.⁵ Occasionally, however, muscular atrophy does occur in diseases that interrupt the motor pathways at the level of the internal capsule, brainstem or spinal cord.⁵

Signs of upper motor neuron involvement (box 2) must be carefully sought in every patient with a unilateral foot drop to avoid such errors in localisation.

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