

INPLASY202640052

doi: 10.37766/inplasy2026.4.0052

Received: 15 April 2026

Published: 15 April 2026

Corresponding author:

Ying-Ching Li

johnhunter0823@gmail.com

Author Affiliation:

Department of Neurosurgery, Chang Gung Memorial Hospital, Taoyuan, Taiwan.

Huang, SH; Wang, HK; Li, CY; Hsu, PW; Lu, YJ; Li, YC.

ADMINISTRATIVE INFORMATION**Support** - No funding was received for this study.**Review Stage at time of this submission** - The review has not yet started.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202640052**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 April 2026 and was last updated on 15 April 2026.**INTRODUCTION**

Review question / Objective The aim of this scoping review is to systematically map the existing evidence on the etiologies, clinical features, and diagnostic approaches for unilateral foot drop across the anatomical spectrum from peripheral nerve to central nervous system lesions. Specifically, this review addresses the following questions: (1) What are the reported etiologies of unilateral foot drop from the deep peroneal nerve to the brain? (2) What clinical features and diagnostic modalities reliably differentiate peripheral from central causes? (3) What diagnostic pitfalls and misdiagnosis patterns have been reported? (4) Can the existing evidence support a structured distal-to-proximal diagnostic algorithm?

Rationale Foot drop is a common clinical presentation that can result from lesions at any level of the motor pathway, from the deep peroneal nerve to the cerebral cortex. While peripheral etiologies such as common peroneal neuropathy

and lumbar radiculopathy are well recognized, central causes including spinal cord and brain lesions are rare and frequently overlooked, potentially leading to delayed diagnosis or unnecessary spinal surgery. Few comprehensive reviews have addressed the full spectrum of foot drop etiologies with a systematic diagnostic framework. This scoping review aims to fill this gap by mapping the available literature and constructing an evidence-based distal-to-proximal diagnostic algorithm to guide clinicians in the evaluation of unilateral foot drop.

Condition being studied Foot drop is a common clinical presentation that can result from lesions at any level of the motor pathway, from the deep peroneal nerve to the cerebral cortex. While peripheral etiologies such as common peroneal neuropathy and lumbar radiculopathy are well recognized, central causes including spinal cord and brain lesions are rare and frequently overlooked, potentially leading to delayed diagnosis or unnecessary spinal surgery. Few comprehensive reviews have addressed the full

spectrum of foot drop etiologies with a systematic diagnostic framework. This scoping review aims to fill this gap by mapping the available literature and constructing an evidence-based distal-to-proximal diagnostic algorithm to guide clinicians in the evaluation of unilateral foot drop.

METHODS

Search strategy PubMed/MEDLINE: (("Peroneal Neuropathies"[MeSH] OR "Gait Disorders, Neurologic"[MeSH] OR "foot drop"[tiab] OR "drop foot"[tiab] OR "dropped foot"[tiab] OR "peroneal palsy"[tiab] OR "peroneal neuropathy"[tiab] OR "fibular neuropathy"[tiab] OR "dorsiflexion weakness"[tiab] OR "dorsiflexor weakness"[tiab] OR "flail foot"[tiab]) AND ("Diagnosis, Differential"[MeSH] OR "Neurologic Examination"[MeSH] OR "Electromyography"[MeSH] OR "Neural Conduction"[MeSH] OR "Magnetic Resonance Imaging"[MeSH] OR "differential diagnosis"[tiab] OR "diagnostic approach"[tiab] OR "diagnostic workup"[tiab] OR "etiology"[tiab] OR "aetiology"[tiab] OR "localization"[tiab] OR "misdiagnosis"[tiab] OR "nerve conduction"[tiab] OR "electromyography"[tiab] OR "EMG"[tiab])) Equivalent strategies adapted for Embase, Cochrane CENTRAL, Web of Science, and Scopus (see full protocol document for database-specific syntax).

Participant or population Patients of any age presenting with unilateral foot drop (weakness of ankle dorsiflexion, MRC grade ≤ 4) of any etiology. No restrictions on age, sex, ethnicity, comorbidities, or clinical setting. Exclusion: patients with bilateral foot drop (e.g., Charcot-Marie-Tooth disease, Guillain-Barré syndrome) unless unilateral cases are reported separately; isolated toe extensor weakness without ankle dorsiflexion deficit.

Intervention Not applicable. This is a scoping review of diagnostic approaches, not an intervention study. The 'concept' under review is the differential diagnosis and diagnostic workup of unilateral foot drop.

Comparator Not applicable. This scoping review does not involve comparison of interventions.

Study designs to be included All study designs will be considered, including: case reports, case series, cross-sectional studies, cohort studies, diagnostic accuracy studies, narrative reviews, and systematic reviews with original synthesis. Exclusion of study designs: animal studies,

cadaveric/anatomical studies without clinical correlation, conference abstracts without sufficient diagnostic data, letters and editorials without original case data.

Eligibility criteria Inclusion: (1) Studies reporting patients with unilateral foot drop of any etiology; (2) Studies providing information on etiology identification, clinical features for localization, diagnostic workup (NCV/EMG, imaging, clinical tests), diagnostic algorithms, or misdiagnosis patterns; (3) Peer-reviewed full-text articles in English, Chinese, Japanese, or Korean; (4) No date restriction. Exclusion: (1) Studies focused exclusively on treatment outcomes without diagnostic characterization; (2) Biomechanical or gait analysis studies without etiological information; (3) Bilateral foot drop studies without separable unilateral data; (4) Conference abstracts only, preprints, book chapters without original data.

Information sources The following electronic databases will be searched from inception to April 2026: (1) PubMed/MEDLINE, (2) Embase (Ovid), (3) Cochrane Central Register of Controlled Trials (CENTRAL), (4) Web of Science Core Collection, (5) Scopus. Supplementary sources: backward citation searching of all included studies; forward citation tracking via Google Scholar; hand searching of recent issues (2020–2026) of Journal of Neurosurgery, Spine, Muscle & Nerve, Journal of Neurology Neurosurgery and Psychiatry, and Clinical Neurophysiology.

Main outcome(s) The main outcomes of this scoping review are: (1) The distribution and frequency of etiologies causing unilateral foot drop across the peripheral–central anatomical spectrum; (2) Key clinical features (motor patterns, sensory findings, pain characteristics, upper motor neuron signs) that reliably localize the lesion to a specific anatomical level; (3) Diagnostic modalities (NCV/EMG, MRI, ultrasound, clinical tests) and their role in differential diagnosis at each anatomical level.

Additional outcome(s) (1) Frequency and patterns of misdiagnosis or delayed diagnosis; (2) Diagnostic delay (time from symptom onset to correct diagnosis); (3) Clinical red flags suggesting central versus peripheral etiology; (4) The role of pain presence/absence as a diagnostic discriminator.

Data management Search results will be exported to EndNote (or Zotero) for deduplication. Two independent reviewers (S.H.H. and H.K.W.) will screen titles and abstracts, followed by full-text

screening. Discrepancies will be resolved by a third reviewer (Y.C.L.). Inter-rater reliability will be assessed using Cohen's kappa at both screening stages (target: $\kappa \geq 0.80$). Data charting will be performed using a standardized Excel workbook. A pilot charting exercise on the first 10 included studies will be conducted to refine the charting form.

Quality assessment / Risk of bias analysis

Formal critical appraisal of individual sources of evidence is not mandatory for scoping reviews per JBI methodology (Chapter 11). However, given the clinical importance of the findings, we will use the JBI Critical Appraisal Checklists appropriate to each study design (e.g., JBI Checklist for Case Reports, JBI Checklist for Analytical Cross-Sectional Studies) to characterize the methodological quality of included sources. Results will be presented descriptively. GRADE assessment is not applicable for scoping reviews.

Strategy of data synthesis

Data will be synthesized using a qualitative (narrative) approach consistent with scoping review methodology (Arksey & O'Malley framework, refined by Levac et al. and JBI). No meta-analysis is planned. Synthesis will be organized thematically by anatomical level (distal to proximal): deep peroneal nerve → common peroneal nerve → sciatic nerve → lumbosacral plexus → lumbar nerve root → spinal cord → brain. For each level, we will synthesize: (a) key clinical features, (b) recommended diagnostic modalities, (c) clinical pitfalls, (d) misdiagnosis patterns. Results will be presented as descriptive tables, frequency charts, and an evidence-based diagnostic flowchart algorithm. An evidence gap map will identify areas where diagnostic evidence is sparse.

Subgroup analysis Not applicable. As a scoping review with qualitative synthesis, formal subgroup analysis is not planned. However, findings will be stratified by anatomical level (peripheral vs. central), by pain characteristics (painful vs. painless foot drop), and by study design where relevant.

Sensitivity analysis Not applicable. Sensitivity analysis is not applicable to scoping reviews with qualitative synthesis.

Language restriction No language restriction will be imposed at the search level. Studies published in English, Chinese, Japanese, and Korean will be included for data charting.

Country(ies) involved Taiwan.

Other relevant information This scoping review will be reported following the PRISMA Extension for Scoping Reviews (PRISMA-ScR) checklist (Tricco AC, et al. *Ann Intern Med.* 2018;169(7):467–473) and the JBI Manual for Evidence Synthesis, Chapter 11: Scoping Reviews. An illustrative case report from the authors' institution will be included in the manuscript to demonstrate a clinical scenario of central-origin foot drop initially misdiagnosed as peripheral pathology. This case has IRB approval from Chang Gung Memorial Hospital. Equal contribution: Sheng-Han Huang and Hong-Kai Wang contributed equally as co-first authors.

Keywords foot drop; differential diagnosis; peroneal neuropathy; radiculopathy; central nervous system; diagnostic algorithm; scoping review; myelopathy.

Dissemination plans

The results of this scoping review will be submitted for publication in a peer-reviewed neurosurgical or neurological journal (target: *Neurosurgical Review*). The diagnostic algorithm will be disseminated as a clinical decision-support tool. Findings may also be presented at national or international neurosurgery conferences (e.g., Taiwan Neurosurgical Society Annual Meeting, AANS/CNS).

Contributions of each author

Author 1 - Sheng-Han Huang.

Email: suntoryer@gmail.com

Author 2 - Hong-Kai Wang.

Author 3 - Cheng-Yu Li.

Author 4 - Peng-Wei Hsu.

Author 5 - Yu-Jen Lu.

Author 6 - Ying-Ching Li.

Email: johnhunter0823@gmail.com