



# Acute bilateral foot drop with or without cauda equina syndrome—a case series

Andreas K. Demetriades<sup>1</sup> · Marco Mancuso-Marcello<sup>1</sup> · Asfand Baig Mirza<sup>2</sup> · Joseph Frantzias<sup>3</sup> · David A. Bell<sup>2</sup> · Richard Selway<sup>2</sup> · Richard Gullan<sup>2</sup>

Received: 25 October 2020 / Accepted: 26 January 2021 / Published online: 7 February 2021  
© The Author(s) 2021

## Abstract

**Introduction** Isolated acute bilateral foot drop due to degenerative spine disease is an extremely rare neurosurgical presentation, whilst the literature is rich with accounts of chronic bilateral foot drop occurring as a sequela of systemic illnesses. We present, to our knowledge, the largest case series of acute bilateral foot drop, with trauma and relevant systemic illness excluded.

**Methods** Data from three different centres had been collected at the time of historic treatment, and records were subsequently reviewed retrospectively, documenting the clinical presentation, radiological level of compression, timing of surgery, and degree of neurological recovery.

**Results** Seven patients are presented. The mean age at presentation was 52.1 years (range 41–66). All patients but one were male. All had a painful radiculopathic presentation. Relevant discopathy was observed from L2/3 to L5/S1, the commonest level being L3/4. Five were treated within 24 h of presentation, and two within 48 h. Three had concomitant cauda equina syndrome; of these, the first two made a full motor recovery, one by 6 weeks follow-up and the second on the same-day post-op evaluation. Overall, five out of seven cases had full resolution of their ankle dorsiflexion pareses. One patient with 1/5 power has not improved. Another with 1/5 weakness improved to normal on the one side and to 3/5 on the other.

**Conclusion** When *bilateral* foot drop occurs *acutely*, we encourage the consideration of degenerative spinal disease. Relevant discopathy was observed from L2/3 to L5/S1; aberrant innervation may be at play. Cauda equina syndrome is not necessarily associated with acute bilateral foot drop. The prognosis seems to be pretty good with respect to recovery of the foot drop, especially if partial at presentation and if treated within 48 h.

**Keywords** Footdrop · Bilateral footdrop · Acute bilateral footdrop · Cauda equina syndrome · Lumbar stenosis · Lumbar disc prolapse · Lumbar disc prolapse · Degenerative spine disease · Surgical treatment · Timing of surgery

## Introduction

Whilst the presence of slowly progressive bilateral foot drop is common in chronic systemic conditions, acute foot drop is a

rare clinical presentation and acute *bilateral* foot drop is even rarer. An aetiology of degenerative spinal disease is rarer still. Only 6 cases have been reported in the previous literature [1, 12, 20, 21, 27].

The most common reports of *acute* bilateral foot drop are due to bilateral common peroneal nerve palsies [17–19, 22, 25, 36], notably due to iatrogenic compression during surgical positioning in a range of surgical specialties [2, 5–7, 10, 13, 16, 24, 32, 33].

We present 7 cases of *acute* and *bilateral* foot drop, all due to degenerative spinal disease, with trauma and relevant systemic illness excluded as causes. We aim to provide insight into the aetiology of acute bilateral foot drop from degenerative spinal causes and provide a schema with which to approach this rare, fairly obscure and challenging clinical presentation.

---

This article is part of the Topical Collection on *Spine degenerative*

✉ Andreas K. Demetriades  
andreas.demetriades@gmail.com

<sup>1</sup> Department of Neurosurgery, New Royal Infirmary, Edinburgh, UK

<sup>2</sup> Department of Neurosurgery, King's College Hospital, London, UK

<sup>3</sup> Department of Neurosurgery, Brighton and Sussex University Hospital, Brighton, UK

## Methods

Demographic and radiological data from seven cases of acute bilateral foot drop which presented to three neurosurgical centres over a 13-year period were prospectively collected by the treating surgical team. Complementary data was collected retrospectively. We reviewed patient demographics, clinical presentation, radiological parameters, and surgical parameters including time from presentation to surgery. Preoperative, early postoperative, and latest follow-up were compared.

## Results

The characteristics of each case in the series are shown in Table 1.

The mean age at presentation was 52.1 years (range 41–66). All patients but one were male. All seven had a radiculopathic presentation and three of these had concomitant cauda equina syndrome (CES).

Six of the seven cases had less than antigravity power at presentation: four patients with 1/5 power bilaterally; one with 0/5 power; one with 2/5. The seventh patient had 3/5 power.

All cases had painful foot drop. Two were operated within 48 h of presentation, whereas the remaining five were operated within 24 h.

Five out of seven cases had full resolution of their ankle dorsiflexion paresis. One patient with 1/5 power never improved. Another with 1/5 weakness improved to normal on the one side and to 3/5 on the other.

Only three out of the seven cases had concomitant CES; the levels of compression in the first two cases were L2/3 and L5/S1, respectively, whilst the final patient had an acute disc prolapse at L2-3 with concurrent canal stenosis at L4/5. These are summarised in Fig. 1. The first two had full resolution of sphincter function, one by the 6 weeks follow-up and the other on the same-day post-op evaluation; both these have residual numbness; one of these had residual sexual dysfunction. The third and most recent patient has had minor improvements overall; however, the follow-up is short thus far and ongoing.

## Discussion

Foot drop is typically defined as significant weakness in ankle (+/- toe) dorsiflexion [39].

There is a variety of surgical and non-surgical differential diagnoses, and theoretically, any pathology affecting any part of the anatomical chain involved in dorsiflexion (brain, spinal cord, nerve roots, lumbosacral plexus, sciatic nerve, peroneal/fibular nerve, and the anterior tibialis muscle) may lead to foot drop.

There are many reports of *chronic* bilateral foot drop occurring as a sequela of medical illnesses. Endocrine causes include hypothyroid myositis [9] and diabetic peripheral neuropathy [31] whilst diseases which modulate nutritional intake such as Anorexia Nervosa [15] and Crohn's disease [8] have been implicated too. Moreover, anterior horn cell disease such as in motor neuron disease [40], neuromuscular junction disease such as myasthenia gravis [11], peripherally demyelinating disease such as the Guillain-Barre syndrome [30], and myopathies such as muscular dystrophy [26] could feasibly present with a *gradual onset* bilateral foot drop.

Reports of traumatic brain injury, and an anterior communicating artery intracranial aneurysm, presenting with acute bilateral foot drop highlight the need to exclude cranial/central causes when no other pathology can be found [14, 28, 34]. Both the brain and spinal cord could be the source of the presentation due to specific vascular, neoplastic, infective, or demyelinating lesions.

The nerve root innervation supplying the tibialis anterior is predominantly L4 and L5, whilst some EMG studies have shown small amounts of nerve fibre recruitment from the L2, L3, S1, and S2 nerve roots [37]. The spectrum of cases in our series supports this pattern of nerve fibre recruitment. Our clinical expectation would be that, commonly, a posterolateral disc protrusion at the L3/4 or L4/5 levels, or a far lateral disc protrusion at the L4/5 or the L5/S1 levels, could cause foot drop. However, acute far lateral disc prolapses are rare bilaterally.

Of the six bilateral foot drop cases due to degenerative disc disease in the literature, four were caused by bilateral posterolateral disc prolapses at the L4/5 level [1, 12, 21, 27], one at the L3/4 level [20], and one at the T12/L1 level [12].

Of our seven cases, one was caused by an L2/3 disc prolapse, three at the L3/4 level (commonest), one at L4/5, and one at L5/S1 disc; one case had compression both at L2/3 and L4/5 levels. Therefore, the majority of both our cases and those reported in the literature align with expectation, but there certainly exist some unexpected disc level prolapses which may be accounted for by aberrant innervation.

Besides degenerative disc disease, other reported spinal aetiologies of acute bilateral foot drop include synovial cysts [3, 4] and an intradural haematoma [38]. An intradural tumour has been implicated in unilateral but not in bilateral foot drop [35].

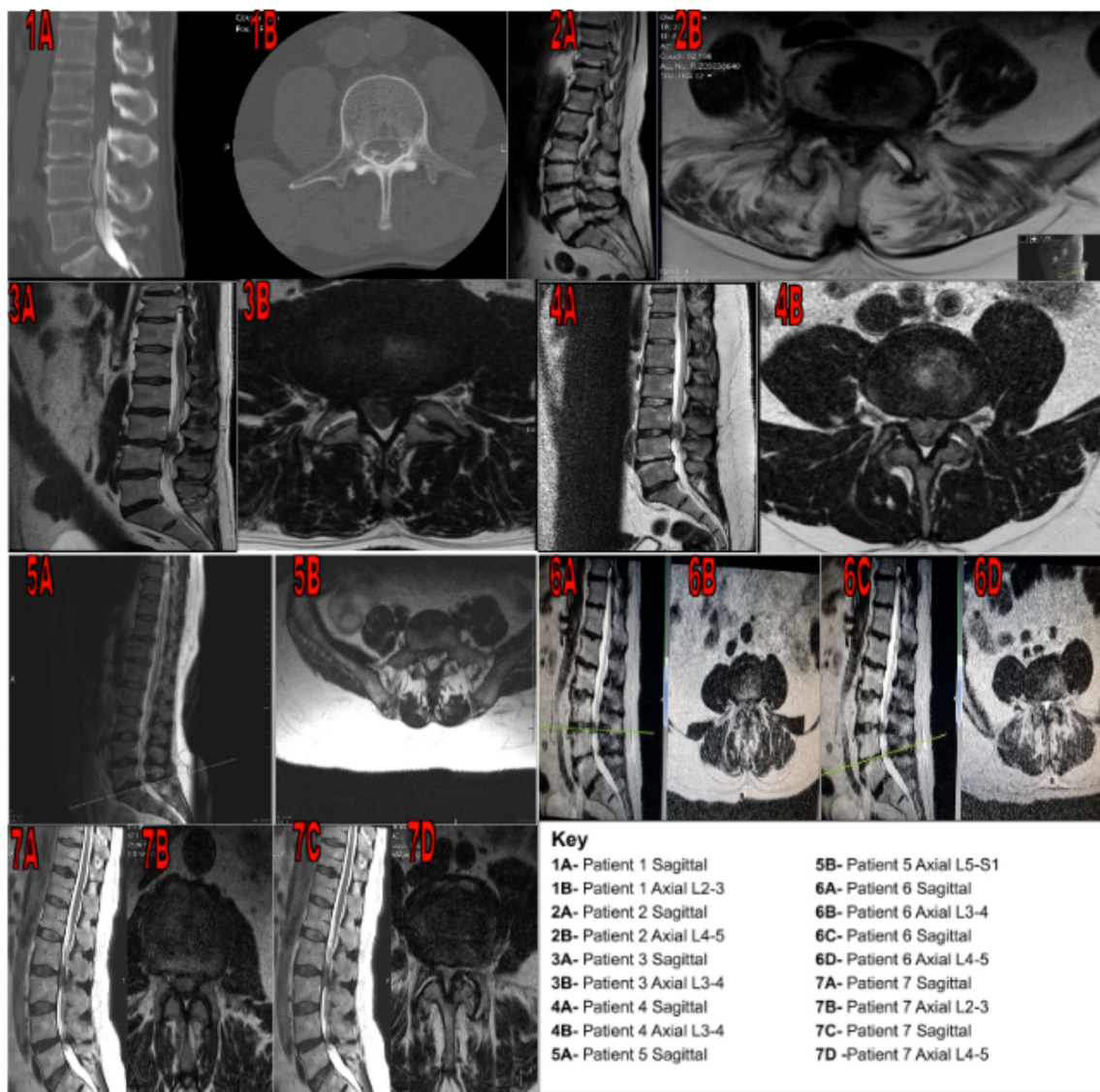
Cauda equina syndrome is not necessarily associated with acute bilateral foot drop. It is interesting that only three out of the seven reported cases had concomitant cauda equina syndrome. This might be initially surprising, because anatomically a disc prolapse that is big enough to compress the foramina bilaterally might be expected to protrude centrally too. However, there was no cauda equina syndrome in four out of seven cases; these had bilateral foraminal stenoses but no central disc prolapses. This is probably related to the presence

**Table 1** Demographic, clinical, and radiological parameters at presentation, and subsequent follow-up

Patient	Age	Sex	Details of presentation	Disc level	Nature of disc prolapse	Pre-op dorsiflexion power (L, R)	
1	57	M	<ul style="list-style-type: none"> <li>● 8 day history of severe back pain and an electrifying sensation in the right leg</li> <li>● worsening weakness in both legs for 3 days, worse on the right than on the left</li> <li>● foot drop for 5 days at presentation</li> <li>● bowel and bladder symptoms</li> <li>● catheterized in hospital</li> <li>● Saddle anaesthesia and a reduced anal sphincter tone</li> <li>● Reduced sensation and weakness of dorsiflexion in both feet</li> <li>● Reduced mobility</li> <li>● 3 weeks of worsening bilateral foot drop</li> <li>● Intermittent paresthesia in right calf and left leg</li> <li>● Presented acutely with severe pain radiating to the lower limbs and bilateral foot drop</li> <li>● 6-day history of right sciatica</li> <li>● 3-day history of left sciatica</li> <li>● Past surgical history included L5/S1 discectomy in 1990 due to low-grade lumbar pain and radiation to lower limbs</li> </ul>	L2-3	Soft and central	(1/5, 1/5)	
2	42	M	<ul style="list-style-type: none"> <li>● Reduced sensation and weakness of dorsiflexion in both feet</li> </ul>	L4-5	Soft and postero-lateral	(1/5, 1/5)	
3	45	M	<ul style="list-style-type: none"> <li>● Presented acutely with low back pain</li> <li>● Bilateral L5 radiculopathy</li> <li>● Weakness in dorsiflexion slight worse on the right side</li> </ul>	L3-4	Soft and postero-lateral	(1/5, 1/5)	
4	41	M	<ul style="list-style-type: none"> <li>● No known previous medical conditions of note</li> <li>● Presented acutely with low back pain and bilateral foot drop</li> </ul>	L3-4	Soft and postero-lateral	(0-1/5, 0-1/5)	
5	51	F	<ul style="list-style-type: none"> <li>● No known previous medical conditions of note</li> <li>● Presented acutely with low back pain and bilateral foot drop</li> </ul>	L5-S1	Soft postero-lateral disc herniation + bilateral lateral recess stenosis	(3/5, 3/5)	
6	63	M	<ul style="list-style-type: none"> <li>● No known previous medical conditions of note</li> <li>● Presented acutely with bilateral foot drop</li> </ul>	L3/4 disc and L3/4-L4/5 lateral recess stenosis	Soft postero-lateral disc herniation + bilateral lateral recess stenosis	(2/5, 2/5)	
7	66	M	<ul style="list-style-type: none"> <li>● Severe acute low back pain radiating down both lower limbs, predominantly on the left</li> <li>● Developed severe low back pain the day before with bilateral lower limb weakness and numbness on soles of the feet leading of a fall due to pain</li> </ul>	L2-3 and L4/5 stenosis	Soft postero-lateral disc herniation + bilateral lateral recess stenosis	(1/5, 1/5)	
Patient	Cauda equina syndrome	Procedure	Time from presentation to surgery (hours)	Post-op dorsiflexion power (L, R)	Latest follow-up (months)	Latest follow-up dorsi flexion power (L, R)	Impression at latest follow-up
1	Yes		48	(1/5, 0/5)	6	(5/5, 5/5)	<ul style="list-style-type: none"> <li>● No pain in the lower back or legs</li> <li>● No bladder symptoms</li> </ul>

Table 1 (continued)

		L2-3 microdiscectomy and bilateral lateral recess decompressions via laminectomy				<ul style="list-style-type: none"> <li>● Difficulty with ejaculation whilst erection is unaffected</li> <li>● Residual muscle weakness proximally in the hips, affecting his knee extension</li> <li>● Perianal and perineal numbness</li> <li>● Lower limb numbness</li> <li>● Discharged from follow-up</li> <li>● Significant improvement of pain</li> <li>● Driving with a right ankle splint</li> <li>● Discharged from follow-up</li> <li>● Independently mobilising</li> <li>● Moving his feet independently with no foot drop</li> <li>● Complains of residual pain and numbness affecting mainly the right leg</li> <li>● Ongoing issues with mobility (due to numbness) and posture with ongoing physiotherapy</li> <li>● Discharged from follow-up</li> <li>● No difficulty in walking</li> <li>● Full return of power</li> <li>● Reports complete resolution of symptoms as of 89 months post-op</li> <li>● Discharged from follow-up</li> <li>● No weakness</li> <li>● No pain</li> <li>● No sphincter problems</li> <li>● Mild reduction in sensation on the lateral aspect of the right leg</li> <li>● Discharged from follow-up</li> <li>● No pain</li> <li>● No weakness as of 3 months post-op</li> <li>● Discharged from follow-up</li> </ul>
2	No	Bilateral L4/5 microdiscectomy	24	(0/5, 0/5)	9	(5/5, 3/5)
3	No	L3 laminectomy + L3/4 microdiscectomy and bilateral lateral recess decompressions	48	(1/5, 1/5)	2	(5/5, 5/5)
4	No	L3/4 microdiscectomy and bilateral lateral recess decompressions	24	(2/5, 1/5)	113	(5/5, 5/5)
5	Yes	L5/S1 microdiscectomy via L5 laminectomy and bilateral lateral recess decompressions	6	(5/5, 5/5)	2	(5/5, 5/5)
6	No	L3/4-L4/5 laminectomy and bilateral lateral recess decompressions and bilateral L3/4 microdiscectomy and foraminotomy	24	(4/5, 4/5)	12	(5/5, 5/5)
7	Yes	L2/3 microdiscectomy and laminectomy and bilateral lateral recess decompressions and L4/5 laminectomy and bilateral lateral recess decompressions	24	(0/5, 0/5)	2	(1/5, 1/5)
						<ul style="list-style-type: none"> <li>● Improvement in pain</li> <li>● Mild improvement of ankle dorsiflexion</li> <li>● Gluteal and hamstring muscle wasting</li> <li>● No flickers of movement felt with active gluteal movement</li> <li>● No sphincter improvement</li> <li>● Follow-up ongoing</li> </ul>



**Fig. 1** Sagittal and axial imaging views of the seven patients with acute bilateral foot drop. In patient 1, where an MRI was contra-indicated, a myelogram was performed. The levels affected ranged from L2/3 to L5/S1. The most commonly affected level was L3/4 in three out of the seven patients

of pre-existing narrow lateral recess anatomy, perhaps allowing an acute on chronic phenomenon.

Of note, five of the seven patients (two in primary care and three in the emergency department) needed to attend more than once before any onward referral for investigation was made. This may reflect some uncertainty amongst non-specialist colleagues on the frontline, which may be arising from a lack of clarity within the specialist (i.e., neurosurgical/spinal) community itself, where the timing of surgery for acute discogenic foot drop remains a point of discussion [23, 29]. We hope that the series presented will help in timely suspicion and investigation of acute lumbar spine aetiology.

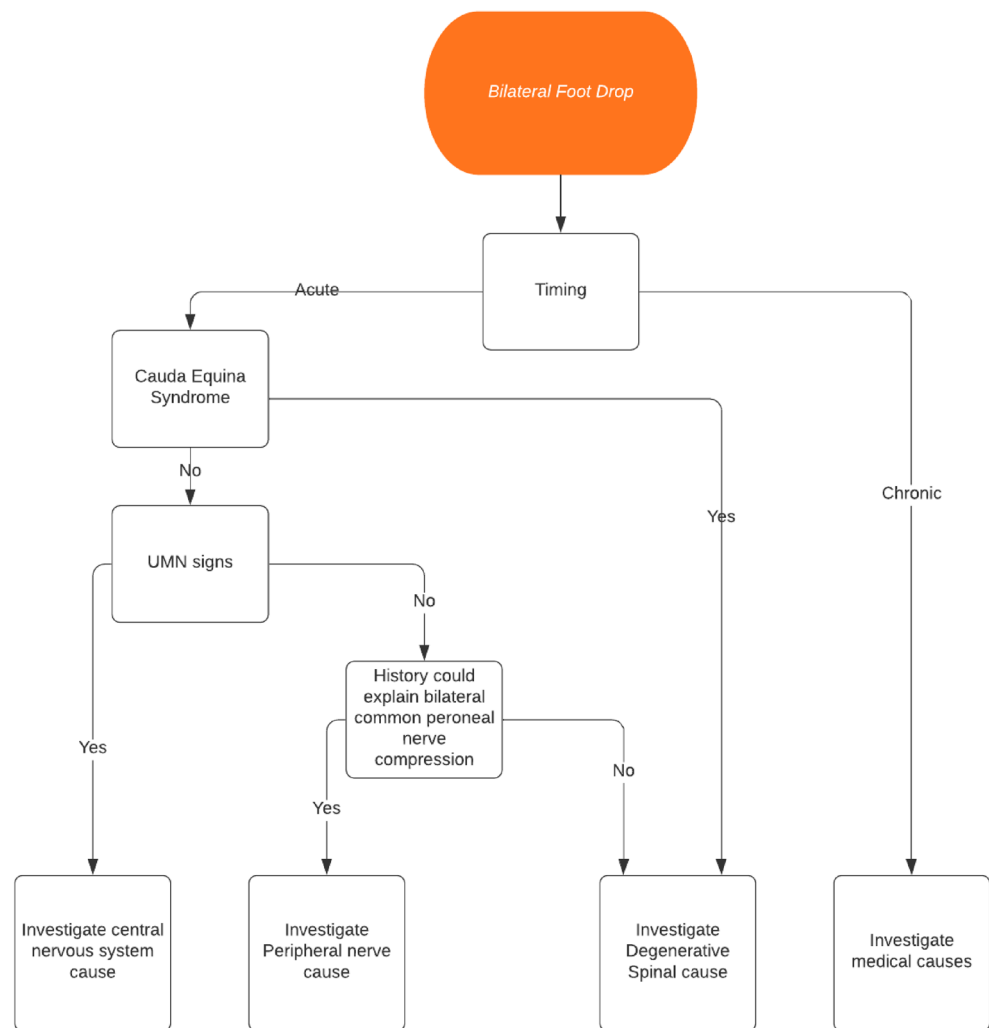
A flow chart illustrating a suggested work-up for bilateral acute foot drop presentation is shown in Fig. 2. We believe

that such patients ought to undergo surgical decompression of the nerve roots as soon as possible, to minimise the degree and duration of damage to the nerve, and hence improve the chance of recovery. However, neural recovery may be influenced by the presence of concomitant morbidity, including diabetes, obesity, and peripheral vascular disease.

**Limitations** The retrospective nature of this report is an obvious limitation. Could it be that the condition of acute and bilateral foot drop due to degenerative disc disease is not rare and may be underreported? One might consider that with unilateral foot drop being a much commoner situation, it may lower the interest of reporting bilateral cases. Or could it be that underreporting might be due to the fact that the line of



**Fig. 2** A flow chart illustrating a suggested work-up for bilateral acute foot drop presentation



conduct and recommendations for treatment do not differ? In our view, the reporting of seven cases encountered over 13 years suggests otherwise. Furthermore, the reality of the rarity of the presentation of acute bilateral foot drop is underlined if we consider that between the authors, we have been in practice for a collective of >100 years.

## Conclusion

Bilateral foot drop can occur in chronic fashion as a sequela of systemic disease. However, when *bilateral* foot drop occurs *acutely*, we encourage the consideration of degenerative spinal disease in the differential diagnosis. Communicating this with colleagues in receiving/referring specialties might be prudent. Relevant discopathy was observed from L2/3 to L5/S1. The prognosis seems to be pretty good with respect to recovery of the foot drop, especially if partial at presentation and if treated within 48 h.

## Declarations

**Ethics approval and consent to participate** All procedures performed were in accordance with the ethical standards of the institutions and with the 1964 Helsinki declaration and its later amendments. For this type of study (retrospective analysis), formal consent is not required

**Conflict of Interest** All authors declare that they have no conflict of interest.

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

## References

1. Adsul N, Kim HS, Choi SH, Jang JS, Jang IT, Oh SH (2018) Acute bilateral isolated foot drop: changing the paradigm in management of degenerative spine surgery with percutaneous endoscopy. *World Neurosurg*. <https://doi.org/10.1016/j.wneu.2017.11.128>
2. Atalay A, Karatas M, Turhan N, Ozturk TS, Emiroglu R, Haberal M (2006) Bilateral drop-foot after orthotopic liver transplant. *Transplant Proc*. <https://doi.org/10.1016/j.transproceed.2006.02.130>
3. Bodian C, Davis J, Hadlow A (2018) Traumatic haemorrhagic lumbar synovial facet cyst presenting as bilateral foot drop: a case report. *N Z Med J* 131(1478):62–64
4. Börekci A, Kuru Bektaşoğlu P, Gürer B, Çelikoğlu E (2017) Acute bilateral foot drop as presenting symptom of hemorrhagic synovial cyst of lumbar spine. *World Neurosurg*. <https://doi.org/10.1016/j.wneu.2017.09.098>
5. Bunch K, Hope E (2014) An uncommon case of bilateral peroneal nerve palsy following delivery: a case report and review of the literature. *Case Rep Obstet Gynecol*. <https://doi.org/10.1155/2014/746480>
6. Durmaz B, Atamaz F, On A (2008) Bilateral common peroneal nerve palsy following cardiac surgery. *Anadolu Kardiyol Derg* 8(4):313–314
7. Erol Ö, Özçakar L, Kaymak B (2004) Bilateral peroneal neuropathy after surgery in the lithotomy position. *Aesthet Plast Surg*. <https://doi.org/10.1007/s00266-004-0026-4>
8. Gariballa SE, Gunasekera NPR (1994) Bilateral foot drop, weight loss and rectal bleeding as an acute presentation of Crohn's disease. *Postgrad Med J*. <https://doi.org/10.1136/pgmj.70.828.762>
9. Gately RP, Rashid MB (2018) Hypothyroid myositis causing bilateral foot drop. *Radiology*. <https://doi.org/10.1148/radiol.2018180730>
10. Ghai A, Hooda S, Kumar P, Kumar R, Bansal P (2005) Bilateral foot drop following lower limb orthopedic surgery under spinal anesthesia. *Can J Anesth*. <https://doi.org/10.1007/bf03016543>
11. Gilad R, Sadeh M (2000) Bilateral foot drop as a manifestation of myasthenia gravis. *J Clin Neuromuscul Dis*. <https://doi.org/10.1097/00131402-200009000-00006>
12. Gürer B, Yılmaz E, Sekerci Z, Kertmen H (2015) Acute bilateral isolated foot drop: report of two cases. *Asian J Neurosurg*. <https://doi.org/10.4103/1793-5482.144596>
13. Hashim SS, Adekanmi O (2007) Bilateral foot drop following a normal vaginal delivery in a birthing pool. *J Obstet Gynaecol*. <https://doi.org/10.1080/01443610701538497>
14. Işık S, Akakın A, Ekşi MŞ, Yılmaz B, Aksoy T, Konakçlı M, Toktaş ZO, Killiç T (2016) Bilateral central foot drop in a pediatric patient. *Pediatr Neurosurg*. <https://doi.org/10.1159/000447409>
15. Kershenbaum A, Jaffa T, Zeman A, Boniface S (1997) Bilateral foot-drop in a patient with anorexia nervosa. *Int J Eat Disord* 22(3):335–337
16. Kiliç E, Özgüçlü E, Erol Ö, Özçakar L (2007) Bilateral foot drop after intestinal surgery: peroneal neuropathy unabated in elderly patients. *J Am Geriatr Soc*. <https://doi.org/10.1111/j.1532-5415.2007.01433.x>
17. Kodaira M, Sekijima Y, Ohashi N, Takahashi Y, Ueno K, Miyazaki D, Ikeda S (2017) Squatting-induced bilateral peroneal nerve palsy in a sewer pipe worker. *Occup Med*. <https://doi.org/10.1093/occmed/kqw133>
18. Koksall A, Dogan VB (2019) Acute bilateral drop foot as a complication of prolonged squatting due to haemorrhoid. *Idegyogy Sz*. <https://doi.org/10.18071/isz.72.0353>
19. Lomaglio M, Canale B (2017) Differential diagnosis and recovery of acute bilateral foot drop in a patient with a history of low back pain: a case report. *Physiother Theory Pract*. <https://doi.org/10.1080/09593985.2017.1323358>
20. Mahapatra AK, Gupta PK, Pawar SJ, Sharma RR (2003) Sudden bilateral foot drop: an unusual presentation of lumbar disc prolapse. *Neurol India* 51(1):71–72
21. Marchesini N, Ricci UM, Soda C, Teli M (2020) Acute bilateral foot drop due to lumbar disc herniation treated by bilateral interlaminar approach: case report and literature review. *Br J Neurosurg*. <https://doi.org/10.1080/02688697.2020.1713992>
22. Margulis M, Ben Zvi L, Bernfeld B (2018) Bilateral common peroneal nerve entrapment after excessive weight loss: case report and review of the literature. *J Foot Ankle Surg*. <https://doi.org/10.1053/j.jfas.2017.10.035>
23. Narasinga Rao KVL, Deora H, Vazhayil V, Tatineni S (2019) Spontaneous recovery of complete foot drop in case of lumbar disk herniation: catcher in the rye? *World Neurosurg* 122:518–521. <https://doi.org/10.1016/j.wneu.2018.09.119>
24. Ömeroglu H, Özçelik A, Turgut A (2001) Bilateral peroneal nerve palsy after simultaneous bilateral total knee arthroplasty. Report of a case with rheumatoid arthritis. *Knee Surg Sport Traumatol Arthrosc*. <https://doi.org/10.1007/s001670100211>
25. Özişler Z, Akyüz M, Yalçın E (2017) Bilateral peroneal neuropathy after bariatric surgery: a case report. *Türkiye Fizik ve Rehabilitasyon Derg*. <https://doi.org/10.5606/tftrd.2017.670>
26. Partanen J (1996) Anterior tibial dystrophy (late onset foot drop muscular dystrophy with rimmed vacuoles). *Neurol Neurochir Pol*. [https://doi.org/10.1016/0022-510X\(94\)90029-9](https://doi.org/10.1016/0022-510X(94)90029-9)
27. Ramnaryan R, Palnikumar C (2018) Bilateral foot drop without cauda equina syndrome due to L4-L5 disc prolapse: a case report. *Internet J Neurosurg* 5:1–6. <https://doi.org/10.5580/384>
28. Rispoli R, Mastrostefano R, Palladini IE, Koumpouros N, Cosimo TDI (2009) Bilateral acute foot drop in a case of axonal injury: a case report. *Neuroradiol J*. <https://doi.org/10.1177/197140090902200209>
29. Satake K, Ito K, Ito K, Ando K, Kobayashi K, Ishiguro N, Imagama S (2020) Neurological function following early versus delayed decompression surgery for drop foot caused by lumbar degenerative diseases. *J Clin Neurosci* 72:39–42. <https://doi.org/10.1016/j.jocn.2020.01.039>
30. Seidel J, Mathew B, Marks J (2016) Bilateral ankle and subtalar joint fusion secondary to Guillain Barré-induced foot drop. *J Foot Ankle Surg*. <https://doi.org/10.1053/j.jfas.2014.06.020>
31. Shahani B, Spalding JM (1969) Diabetes mellitus presenting with bilateral foot-drop. *Lancet*. [https://doi.org/10.1016/S0140-6736\(69\)90590-X](https://doi.org/10.1016/S0140-6736(69)90590-X)
32. Shank JR, Morgan SJ, Smith WR, Meyer FN (2003) Bilateral peroneal nerve palsy following emergent stabilization of a pelvic ring injury. *J Orthop Trauma*. <https://doi.org/10.1097/00005131-200301000-00012>
33. Shih CK (2017) Immediate bilateral peroneal nerve palsy in a healthy null parturient after elective Cesarean section. *Asian J Anesthesiol*. <https://doi.org/10.1016/j.aja.2017.05.003>
34. Sweid A, Tjoumakaris S, Herial N, Gooch MR, Rosenwasser RH, Jabbour P (2019) Case report of a partially thrombosed ACoA aneurysm presenting with bilateral foot drop. *Clin Neurol Neurosurg*. <https://doi.org/10.1016/j.clineuro.2019.105490>
35. Tolias CM, Beale DJ, Sakas DE (1997) Giant lumbar meningioma: a common tumour in an unusual location. *Neuroradiology*. <https://doi.org/10.1007/s002340050408>
36. Vasilakis V, Hamade M, Stavrides SA, Davenport TA (2018) Bilateral sciatic neuropathy following gluteal augmentation with autologous fat grafting. *Plast Reconstr Surg Glob Open*. <https://doi.org/10.1097/GOX.0000000000001696>
37. Voermans NC, Koetsveld AC, Zwartz MJ (2006) Segmental overlap: foot drop in S1 radiculopathy. *Acta Neurochir*. <https://doi.org/10.1007/s00701-006-0754-0>

38. Waldron JS, Oh MC, Chou D (2011) Lumbar subdural hematoma from intracranial subarachnoid hemorrhage presenting with bilateral foot drop: case report. *Neurosurgery*. <https://doi.org/10.1227/NEU.0b013e3182078099>
39. Wang Y, Nataraj A (2014) Foot drop resulting from degenerative lumbar spinal diseases: clinical characteristics and prognosis. *Clin Neurol Neurosurg*. <https://doi.org/10.1016/j.clineuro.2013.11.018>
40. Westhout FD, Pare LS, Linskey ME (2007) Underappreciated differential diagnoses. *J Spinal Cord Med*. <https://doi.org/10.1080/10790268.2007.11753915>

**Publisher's note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.