Neurogenic claudication differential diagnosis

J.Sales-Llopis; Vélez-Jiménez PA

Neurosurgery Service, General University Hospital Alicante, Spain.

When patients come to hospital with complaints of leg pain, clinicians should consider vascular pathologies before reaching definitive diagnosis, using detailed patient history and comprehensive physical examination [1)]

Despite a physician's diagnosis with imaging confirmation, the physical therapist is encouraged to complete a thorough evaluation to screen for underlying disease processes and proceed with appropriate treatment or referral [2)]

see Ankle-Brachial Index

- Anemia-induced Claudication Mimicking Lumbar Spinal Stenosis: A Case Report
- Redundant nerve root syndrome mimicking an intradural spinal cord tumor: A case report
- Intermittent Claudication Secondary to Spine and/or Spinal Cord Diseases
- Ligamentum Flavum Cyst With Acute Onset Motor Deficit: A Literature Review and Case Series
- Delayed Diagnosis of Tandem Spinal Stenosis: A Retrospective Institutional Review
- Common iliac artery occlusion presenting with back and leg pain: case report and differential diagnosis considerations for neurogenic/vascular claudication
- CME: Lumbar spinal stenosis
- Leriche syndrome

1. vascular insufficiency: (AKA vascular or intermittent claudication)

2. hip disease: trochanteric bursitis, degenerative joint disease

3. disc herniation (lumbar or thoracic)

4. facet joint pain (controversial): may respond to medial branch block (therapeutic & diagnostic)

5. Baastrup's syndrome

6. juxtafacet cyst

7. arachnoiditis

8. intraspinal tumor

9. Type I spinal AVM (spinal dural AVM)

10. diabetic neuritis: with this, the sole of the foot is usually very tender to pressure from the examiner’s thumb

11. delayed onset muscle soreness (DOMS): onset usually 12–48 hours after beginning a new activity or changing activities (NC occurs during the activity). Symptoms typically peak within 2 days and subside over several days

12. inguinal hernia: typically produces groin pain

13. functional etiologies

Symptomatic lumbar spinal stenosis produces gradually progressive back and leg pain with standing and walking that is relieved by sitting or lying (neurogenic claudication)

● symptoms differentiated from vascular claudication which is usually relieved at rest regardless of position

Physicians use a profile based on symptom attributes to differentiate the 2 types of claudication, and this guides their investigations for diagnosis of the underlying pathology. We evaluated the validity of these symptom attributes in differentiating neurogenic from vascular claudication.

Lumbar spinal stenosis (LSS) or peripheral vascular disease (PVD)

The most sensitive symptom attribute to rule out LSS was the absence of “triggering of pain with standing alone” (sensitivity 0.97, NLR 0.050). Pain alleviators and symptom location data showed a weak clinical significance for LSS and PVD. Constellation of symptoms yielded the strongest associations: patients with a positive shopping cart sign whose symptoms were located above the knees, triggered with standing alone and relieved with sitting had a strong likelihood of neurogenic claudication (PLR 13). Patients with symptoms in the calf that were relieved with standing alone had a strong likelihood of vascular claudication (PLR 20.0).

The classic symptom attributes used to differentiate neurogenic from vascular claudication are at best weakly valid independently. However, certain constellation of symptoms are much more indicative of etiology. These results can guide general practitioners in their evaluation of and investigation for claudication [3].

A central disc herniation may cause symptoms of lumbar stenosis.

An extended lumbar posture narrows a degenerative stenotic spinal canal to a critical threshold, leading to direct mechanical compression or indirect vascular compression of the nerve roots and/or cauda equina [4] [5].

The location of the symptoms (above the knees for neurogenic claudication; below the knees for vascular claudication) as well as the symptom alleviators (sitting for neurogenic claudication; standing for vascular claudication). However, alleviation of symptoms with standing alone has a moderate correlation with vascular claudication; its presence could direct physicians toward a vascular workup rather than neurogenic investigations.

Certain constellations of symptom attributes are more strongly associated with each type of claudication.

The presence of symptoms that are triggered with standing, relieved with sitting, located above the knees and have a positive shopping cart sign represent strong evidence that a patient has intermittent neurogenic claudication rather than vascular claudication. On the other hand, a patient with symptoms that are relieved with standing alone and located below the knees is much more likely to have vascular than neurogenic claudication [6].

Lumbar spinal stenosis often presents with neurogenic neurogenic claudication (NC) (claudicate: from Latin, claudico, to limp) AKA pseudoclaudication. To be differentiated from vascular claudication (AKA intermittent claudication), which results from ischemia of exercising muscles

Symptomatic lumbar spinal stenosis produces gradually progressive back and leg pain with standing and walking that is relieved by sitting or lying (neurogenic claudication)

● symptoms differentiated from vascular claudication which is usually relieved at rest regardless of position

---

Physicians use a profile based on symptom attributes to differentiate the 2 types of claudication, and this guides their investigations for diagnosis of the underlying pathology. We evaluated the validity of these symptom attributes in differentiating neurogenic from vascular claudication.

Lumbar spinal stenosis (LSS) or peripheral vascular disease (PVD)

The most sensitive symptom attribute to rule out LSS was the absence of “triggering of pain with standing alone” (sensitivity 0.97, NLR 0.050). Pain alleviators and symptom location data showed a weak clinical significance for LSS and PVD. Constellation of symptoms yielded the strongest associations: patients with a positive shopping cart sign whose symptoms were located above the knees, triggered with standing alone and relieved with sitting had a strong likelihood of neurogenic claudication (PLR 13). Patients with symptoms in the calf that were relieved with standing alone had a strong likelihood of vascular claudication (PLR 20.0).

The classic symptom attributes used to differentiate neurogenic from vascular claudication are at best weakly valid independently. However, certain constellation of symptoms are much more indicative of etiology. These results can guide general practitioners in their evaluation of and investigation for claudication [7].

1)
Demirgan S, Şitilci AT, Solak S, Sevdi MS, Erkalp K, Köse E. Leriche sendromu [Leriche syndrome]. Agri. 2017 Jan;29(1):38-42. Turkish. doi: 10.5505/agri.2015.65983. PMID: 28467568.
2)
Huml EL, Davies RA, Kearns GA, Petersen SM, Brismée JM. Common iliac artery occlusion presenting with back and leg pain: case report and differential diagnosis considerations for neurogenic/vascular claudication. J Man Manip Ther. 2018 Dec;26(5):249-253. doi: 10.1080/10669817.2018.1526465. Epub 2018 Oct 8. PMID: 30455551; PMCID: PMC6237159.
3) , 6) , 7)
Nadeau M, Rosas-Arellano MP, Gurr KR, Bailey SI, Taylor DC, Grewal R, Lawlor DK, Bailey CS. The

reliability of differentiating neurogenic claudication from vascular claudication based on symptomatic presentation. Can J Surg. 2013 Dec;56(6):372-7. PubMed PMID: 24284143; PubMed Central PMCID: PMC3859778.

4) Wilson CB. Significance of the small lumbar spinal canal: cauda equina compression syndromes due to spondylosis. J Neurosurg. 1969;31:499–506.

5) Epstein NE, Maldonado VC, Cusick JF. Symptomatic lumbar spinal stenosis. Surg Neurol. 1998;50:3–10.