

Neuropathic pain in Brown-Séguard Syndrome: A Diagnostic Dilemma

Akshat Gargya, MD FIPP, Jonathan Gougelet MD

Department of Anesthesiology, Division of Interventional Pain, University of Vermont Medical Center

INTRODUCTION

Brown-Séguard Syndrome (BSS) is a neurological condition characterized by damage to one-half of the spinal cord. Typical symptoms include weakness or paralysis on one side of the body and loss of pain and temperature sensation on the opposite side [1]. This presentation is rare, accounting for only 1-4% of spinal cord injuries [2]. Originally observed in the context of penetrating spinal cord injuries, BSS can also be caused by various factors such as tumors, cysts, or myelitis [3]. Despite its uncommon occurrence, BSS carries a favorable prognosis, with over 75% of individuals regaining the ability to walk after undergoing rehabilitation [3]. While BSS itself may not present with neuropathic pain, other complications or associated conditions might contribute to pain experiences.

Neuropathic pain is a prevalent diagnosis in pain clinics, with a large cross-sectional study estimating that around 10% of the population is affected by it [4]. The evaluation of neuropathic pain typically involves a thorough examination of the patient's history and a physical examination [5]. However, challenges arise when patients have pre-existing sensory or motor abnormalities.

In this context, we present the case of a patient with a history of Brown-Séguard Syndrome who subsequently developed neuropathic pain following a fibular fracture.

CASE PRESENTATION

A 71-year-old male presented to the Pain clinic with a surgical history of C2 spinal tumor removal 25 years ago which resulted in paraplegia and Brown-Séguard Syndrome.

Subjective:

The patient presented with a burning sensation on the lateral aspect of his right calf, which had developed two years ago following a fibular fracture.

The burning sensation, rated at an intensity of “15”/10, was intermittent and not consistently accompanied by pain. However, it severely limited his movement during episodes, despite the absence of pain. The patient could walk with a walker but faced restrictions when the sensation occurred.

Physical Examination:

Abnormal sensations were noted in his legs bilaterally in a non dermatomal distribution.

There was diminished ankle dorsiflexion strength on the left leg (4/5). Strength in the right leg was normal (5/5).

Diagnostic Studies:

A recent electromyography (EMG) revealed right superficial fibular sensory neuropathy without a motor component in the fibular neuropathy. A lumbar MRI scan showed an L2-L3 disc bulge with a left foraminal annular fissure and ligamentum flavum thickening, causing mild spinal canal stenosis.

Management:

The patient was scheduled for a Peroneal Nerve Peripheral Nerve Stimulator implantation proximal to the fibular fracture site.

DISCUSSION

Our case underscores the challenges encountered by pain physicians when diagnosing neuropathic pain in patients whose underlying conditions, such as Brown-Séguard syndrome, can obscure specific neuropathic symptoms, especially pain and sensory changes.

Given the unilateral spinal cord injury characteristic of BSS, the classical signs of neuropathic pain, such as sensory abnormalities and pain, may not manifest as expected.

If a pain management physician suspects neuropathic pain in a patient with Brown-Séguard Syndrome, they should take a comprehensive approach to diagnose and manage the pain. This, in addition to a thorough history and physical exam should include:

1. Imaging studies: such as magnetic resonance imaging (MRI), to assess the extent and location of the spinal cord injury and identify any associated structural abnormalities or compression.

2. Electrodiagnostic Tests: such as electromyography (EMG) and nerve conduction studies, to evaluate nerve function and identify abnormalities that may contribute to pain.

The identification of right superficial fibular sensory neuropathy in our patient population highlights the utility of EMG in elucidating subtle neuropathic nuances that might otherwise go unnoticed.

3. Pain Assessment Tools: such as The Leeds Assessment of Neuropathic Symptoms and Signs (LANSS) pain scale.

While sensory changes may be absent in the affected side of the body in BSS, other types of pain (e.g., tingling, burning, shooting pain) may still be reported by the patient

The absence of typical sensory changes on one side of the body should not exclude the possibility of neuropathic pain, and a comprehensive assessment is essential for effective pain management.

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