

# Sub-group Classification of Low Back Related Leg Pain: Is this the Catalyst Needed for Other Challenging Conditions?

## The Many Variations of Radicular Pain

Low back related leg pain (LBLP) or *radicular pain*<sup>1</sup> exists in many variations and has been associated with poor prognosis in a number of studies<sup>2-5</sup>. Evidence has shown that LBLP is predictive of progression to chronicity<sup>6</sup>, poor outcomes with conservative care<sup>2</sup>, as well as lower functional status, well being, and higher levels of disability<sup>7</sup>. Why some patients with LBLP and not others progress toward disability is unknown<sup>8</sup>.

Often, the pain associated with LBLP is indistinct. To some degree, an explanation of symptom variation is associated with dissimilar lumbar segment origins (e.g., L4 versus L5)<sup>9</sup>, conditions that mimic radicular symptoms such as tumors, diabetic neuropathy, or methyl metacrylate neuropathy<sup>1</sup>, musculoskeletal dysfunctions of the lower limbs (myofascial pain)<sup>9</sup>, or when injury is present to a non-localized region of the sciatic nerve<sup>10</sup>. Another reason for variation is the multiplicity of potential neural and/or musculoskeletal structures associated with LBLP, which is not limited to a disc herniation or lumbar stenosis. To further the complexity, radicular pain (radiating pain) is not exclusively associated with *radiculopathy*, which is a clinical condition associated with loss of sensation and/or motor function as a result of a conduction block<sup>1</sup>.

Diagnosis of LBLP involves a number of suspect clinical and imaging test methods. The straight leg raise is a sensitive test but lacks specificity<sup>11</sup>. Tests associated with neurological examination (sensibility, reflex, manual muscle testing, etc.) have very low sensitivities indicating findings may be below the threshold needed for the tests to be positive<sup>11,12</sup>.

The crossed (or well) straight leg raise is a specific measure but also lacks sensitivity<sup>13</sup>. Report of symptoms using terms such as “sharp”, “burning” and “aching” and pain that fails to subside immediately during position changes has been associated with radiculopathy<sup>14</sup>. At present, there are no clinical decision rules to dictate diagnosis of a specific LBLP condition.

Imaging methods fare slightly better. Diagnostic blocks appear best served when ascertaining the guilty level when multiple levels are examined<sup>13</sup>. Magnetic resonance imaging (MRI) examining nerve root compression has demonstrated moderate reader reliability<sup>15,16</sup> and is sensitive during identification of nerve root compression<sup>17</sup>. Further source differentiation may warrant the use of electrodiagnostic techniques for assessment of nerve conduction changes to truly isolate radiculopathy<sup>18</sup>.

## Interventions Associated with Leg Pain

Targeting the proper interventions to the underlying problem (classification) has been advocated for treatment of low back pain<sup>19</sup>. Interventions associated with LBLP have included specific exercises for reduction of peripheral symptoms, traction, and surgery. For conservative care geared toward leg pain, the results are mixed, even when targeted and specific treatment methods are used. For traction, only marginal initial improvements were found after two weeks and no substantial changes were evident when compared with a control group that received no traction<sup>20</sup>. For patients who had received a decompression surgery, a me-

chanical approach that targeted neural mobilization methods did not show any form of improvement<sup>21</sup>.

Although only recently delineated, LBLP is one of the most predictive elements associated with positive reports of change after lumbar surgery<sup>7,22</sup>. For patients with stenosis and LBLP, it does appear that patients that exhibit the most severe nerve root compression and corresponding leg symptoms are most likely to achieve success with decompression surgery<sup>17</sup>, specifically conditions that are associated with unilateral leg pain<sup>23</sup>. At this time, the exact degree, nature, and functional impact associated with unilateral leg pain is unknown.

## Classification

In 2008, Schafer and colleagues<sup>24</sup> published a classification scheme for neural LBLP using dominant patho-mechanistic criteria. The authors classified four groups: 1) Central Sensitization, 2) Denervation, 3) Peripheral Nerve Sensitization, and 4) Musculoskeletal, and a fifth group 5) mixed when findings overlapped. Their classification system is built on the assumption that failure to distinguish different forms of referred pain may lead to inappropriate and ineffective treatments and investigations<sup>25</sup>. In this issue, Schafer et al<sup>26</sup> analyze the interrater reliability of the classification system for patients with neural LBLP and Walsh et al<sup>27</sup> evaluate whether subgroups differed in terms of disability and psychosocial factors. In essence, this work provides sub-classifications of LBLP within classifications generally ascribed as radicular pain, traction, or leg pain groups.

It is my hope that research will continue to explore the concept of sub-

classification. For example, using the treatment based classification system proposed by Delitto and colleagues<sup>19</sup> as a reference, it is logical to assume that a number of sub-classifications of specific exercise exist that benefit from patient-generated, repeated movements. Further exploration of the immobilization group may find that some patients benefit from a global exercise and fitness whereas others require a more defined local intervention. Earlier work involving patients who fall into the mobilization group demonstrates that some patients benefit from manipulation if they meet a distinct group of characteristics<sup>28</sup>. It is possible and likely that there are other sub-groups with unique examination findings who benefit from manipulation that do not meet these characteristics. What is imperative to note is that these subgroup characteristics reported within the literature may not adequately represent the *whole* classification group, but are a unique findings that require a specific intervention (a sub-classification of a classification group).

It is my impression, that investigation into sub-classifications will also be final piece of the puzzle that lures the non-believers to the classification pulpit. Despite fractional evidence to the contrary<sup>29,30</sup>, many skilled, experienced, and talented clinicians still argue that a gestalt approach provides better outcomes than a blanket classification-driven approach. It's likely that the primary problem with classification approaches is the clinician's concept of homogeneity of clinical findings with the description of the classification group. Sub-classification may allow clinicians to provide further refined care to focus on the specificity of each individual patient intervention. A similar approach has been explored by oncologists after recognition of the complexities in the care of cancer patients<sup>31</sup> and trauma physicians when dealing with vague and troubling conditions<sup>32</sup>.

I may be guilty of oversimplifying this process. Defining sub-classifications such as those provided in this issue require critical exploration and testing. Multiple variables may contribute to diagnosis and/or prognosis and each of these demands careful evaluation.

Clearly though, this is a necessary step in improving our diagnostic and treatment approaches to all troublesome conditions, specifically one such as LBLP.

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