Straight Leg Raise Test

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Introduction

The straight leg raise test also called the Lasegue test, is a fundamental neurological maneuver during the physical examination of the patient with lower back pain aimed to assess the sciatic compromise due to lumbosacral nerve root irritation. This test which was first described by Dr. Lazarevic and wrongly attributed to Dr. Lasegue can be positive in a variety of conditions, being lumbar disc herniation the most common. Nonetheless, there are multiple causes of a positive test such as facet joint cyst or hypertrophy.[1][2][3][4] Overall, this test is one of the most commonly performed maneuvers across clinical practice and provides important information when making the clinical decision to refer a patient to a specialist as well as among spinal surgeons to guide therapeutic decision-making.[5]

Low back pain is one of the most common complaints among active workers and a significant cause of absenteeism from work. Sciatic pain is radiating pain from the buttocks to the leg and is frequently associated with low back pain.[6] In this regard, the neurological examination is fundamental in discriminating patients with isolated lower back pain from those with associated radiculopathy. Consequently, early recognition of radiculopathy allows a targeted treatment and diminishes disability.[7] The specificity of the straight leg raise test has been reported to be low,[8] making the diagnosis accuracy limited. However, the clinical usefulness of this test remains important both for general practitioners as for spine surgeons and should still be considered a relevant component of the physical examination that, associated with proper imaging studies can lead to an accurate diagnosis and treatment.

Therefore the objective of this review is to describe the maneuver technique, pathophysiology, history, and usefulness of this common test through a review in the literature.

Anatomy and Physiology

The Lasegue test is basically a provocation test that evidences radicular irritation in the lumbosacral region by lower limb flexion and can be due to multiple causes. Radicular symptoms are primarily produced by nerve root inflammation by surrounded structures.[9] The foramina are formed by the pedicle superiorly and inferiorly, ligamentum flavum posteriorly, disc and vertebral body anteriorly, and this small space normally allows the nerve root excursion of 4 mm, however during the straight leg raise test this root excursion can be compromised by several factors. Mechanical compression solely does not always generate radicular symptoms as many patients have asymptomatic foraminal stenosis in magnetic resonance imaging (MRI),[10] [11] therefore, positive leg raise test may undergo influence by nerve root irritation secondary to inflammation as well as mechanical compression.

The straight leg raise test is attributed to Charles Lasegue, a French clinician who described two cases of sciatica aggravated by weight-bearing, hip, and knee flexion in “Thoughts of Sciatica” in 1864. Nonetheless, Dr. Lasegue did not describe the test as a provoked pain; instead, his
student JJ Forst described the test in his doctoral thesis in 1881, and it was Forst who considered the pain to be produced by hamstring muscle compression to the sciatic nerve.

Nevertheless, it is believed that a Serbian neurologist, Dr. Lazar Lazarevic,[12] was the first who documented the straight leg raise test as it is known today in the article named “Ischiac postica cotunnii“, initially published in the Serbian Archives of Medicine (1880), and republished in Vienna (1884). Dr. Lazarevic described the straight-leg-raising test by explaining sciatic pain by stretching the sciatic nerve based on his experience with six patients. Based on this misinterpretation of the original description, it is recommended to describe the maneuver as the straight leg raise test.

**Indications**

- Low back pain
- Buttock pain
- Leg pain

**Personnel**

- Primary care provider
- Orthopedic surgeon
- Neurologist
- Neurosurgeon
- Sport's medicine specialist
- The nurse
- Physiotherapist
- Chiropractor

**Technique**

The straight leg raise test is performed with the patient in a supine position. The examiner gently raises the patient's leg by flexing the hip with the knee in extension, and the test is considered positive when the patient experiences pain along the lower limb in the same distribution of the lower radicular nerve roots (usually L5 or S1).

Furthermore, a positive straight leg raise test is determined when pain is elicited by lower limb flexion at an angle lower than 45 degrees. During the test, if the pain is reproduced during the leg straightening, patients usually request that the examiner aborts the maneuver and by flexing the patient’s knee, the buttock pain is usually relieved(Figure 1).

Additional maneuvers have been described to enhance the sensitivity of the test such as the Bragaad’s sign, which consists of concomitant foot dorsiflexion to increase the pain while the examiner completes the leg raise.

An additional maneuver is the crossed straight leg test (crossed over Lasegue), in which the examiner passively flexes the patient’s uninvolved limb while maintaining the knee in extension. A positive test is when the patient reports pain in the involved limb at 40 degrees of hip flexion.
with the uninvolved limb. A crossed straight test is positive in central disc herniation in cases of severe nerve root irritation.[13]

Clinical Significance

Previous analysis of the sensitivity and specificity of the straight leg raise test shows high sensitivity and low specificity of lumbar disc protrusion.[8][14] However, most of the literature is limited by poor quality and were performed in surgical case-series at non-primary care level, limiting the external validity of these findings. Also, some studies have shown restricted diagnosis accuracy of neurological examination in detecting disc herniation with radiculopathy. [15] As the test demonstrates high sensitivity, it could be useful to rule out lumbar disc protrusion; however, the utility is limited due to low specificity as it can be positive in ischialgia secondary to other causes.

Straight leg raise test is an important physical examination finding during primary care to assess the need for imaging studies such as X-rays and MRI, and the potential need for a referral from primary care to a spine specialist.

This test is also relevant among spine specialists to guide proper treatment options,[15] being positive Lasegue test a sign of nerve root irritation and possible entrapment, which might require a nerve root injection or surgery.[16]

A positive straight leg raising test (also known as Lasegue sign) results from gluteal or leg pain by passive straight leg flexion with the knee in extension, and it may correlate with nerve root irritation and possible entrapment with decreased nerve excursion. This clinical neurological test has high sensitivity and low specificity, being an important diagnostic workup in patients with lower back pain and suspected radiculopathy. This test is relevant to guide referrals among primary care providers as well as to guide treatment among spinal surgeons especially when considering a surgical decision.

Enhancing Healthcare Team Outcomes

Low back pain is among the most common complaints among active workers and a significant cause of absenteeism from work. Sciatic pain is radiating pain from the buttocks to the leg and is frequently associated with low back pain. In this regard, a neurological examination is fundamental in distinguishing patients with isolated lower back pain from those with associated radiculopathy. Consequently, early recognition of radiculopathy allows a targeted treatment and diminishes disability. Performing this maneuver correctly, when indicated, helps primary care providers, nurse practitioners, emergency department physicians, and internists assess the need for imaging studies such as X-rays and MRI and the potential need for a referral from primary care to a spine specialist. The best possible outcome for patients with low back pain could never be achieved, without the interprofessional collaboration of the mentioned various disciplines. The need for clear communication strategies between healthcare providers and their patients is key to the attainment of the best possible standards of care.

Nursing, Allied Health, and Interprofessional Team Interventions

- The nurse will help position the patient before, during and, after performing the straight leg raise test.
- The nurse needs to inform the patient about the follow-up appointments and the care plan designed by the provider.
The nurse needs to report any untoward changes in the vital signs or the pain score of the patient, to the clinician.

**Nursing, Allied Health, and Interprofessional Team Monitoring**

- Vital signs
- Pain scores
- GCS (Glasgow Coma Scale/Score)

**Continuing Education / Review Questions**

- Earn continuing education credits (CME/CE) on this topic.
- Access board review questions for this topic.
- Comment on this article.

**Figure**

Figure 1. A) Straight leg raise test. B) Bragaad's Test to increase the test sensitivity. C) When flexing the knee the patient usually experience pain relief. Contributed By Gaston Camino Willhuber, MD

**References**


