

## CASE REPORT

# Interspinous Ligament as a Pain Generator

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## ABSTRACT

**Introduction:** Interspinous ligament is an uncommon but potential pain generator in the spinal column that can give rise to chronic low backache. Interspinous ligament sprain is difficult to diagnose with radiologic imaging, such as X-ray, and magnetic resonance imaging. Only meticulous history and diagnostic block help in making a proper diagnosis. This case report describes a case of interspinous ligament sprain in a young male patient who presented with a history of chronic low back pain. His imaging studies revealed no abnormalities and the diagnostic local anesthetic infiltration confirmed the diagnosis.

**Keywords:** Interspinous ligament, Low back pain, Pain generator.

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## INTRODUCTION

Low back pain has been a major health issue not only in the West but also in the Indian subcontinent. Developments in the interventional pain management over the past two decades have helped in better understanding of the pathophysiology of low back pain. Many structures in and around the spine have been identified as potential pain generators. Intervertebral disks, facet joints, paraspinal muscles, dura, spinal ligaments are all pain-sensitive structures and can contribute to low backache. Interspinous ligament sprain has a prevalence of less than 10%.<sup>1</sup> We present here such a rare case of interspinous ligament sprain where diagnosis was confirmed by local anesthetic infiltration.

## CASE REPORT

A young 30-year-old male, mason by occupation, presented to our pain clinic with complaints of low backache since 4 months. His back pain was axial, well localized to L3-4 area, nonradiating, nociceptive in nature. The pain

aggravated on sitting for few minutes, bending forward, and it was relieved by standing, extending backward, and lying down. The pain severity was 7 out of 10 on a numerical rating scale. On examination, there was tenderness in the L3-4 interspinous space. No sensory or motor deficits were noted. Four and half months back, patient gave history of circumcision surgery under spinal anesthesia and was blaming the spinal anesthetic for his back pain.

A clinical diagnosis of interspinous ligament sprain was made. Magnetic resonance imaging of the lumbosacral spine (which was already ordered by an orthopedician) revealed no abnormality. Local infiltration of 4 cc of 1% lignocaine and 20 mg depomedrol into L3-4 interspinous ligament gave him complete pain relief, which confirmed the diagnosis and also resulted in pain relief.

## DISCUSSION

The interspinous ligaments are thin and membranous ligaments that connect adjoining spinous processes of the vertebra in the spine. They extend from the root to the apex of each spinous process. They meet the ligamenta flava in front and blend with the supraspinous ligament behind. The interspinous ligament is narrow and elongated in the thoracic region, and broader, thicker, and quadrilateral in the lumbar region and occurs as closely applied pairs.<sup>2</sup>

The interspinous ligament is well supplied by small blood vessels and sensory nerves, the latter particularly in its dorsal part and on its lateral surfaces. They receive innervation from the medial branches of lumbar dorsal rami. Nerve supply is equally distributed along the ligament, symmetrically distributed between left and right sides, and more densely distributed in the periphery. Pacinian corpuscles are scattered randomly, close to blood vessels, whereas Ruffini corpuscles are in the periphery, close to the collagen bundles.

Function is to limit flexion of the vertebral column. Stimulation of the interspinous ligament produces low back pain and referred pain in the lower limbs.<sup>3</sup> Interspinous ligaments are involved in both acute and chronic spinal pain. A single trauma or cumulative microtrauma can cause injuries of the ligaments and embedded mechanoreceptors. The injured mechanoreceptors generate corrupted transducer signals, which lead to corrupted muscle response patterns produced by the neuromuscular control unit. This can result in muscle incoordination affecting individual muscle force

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characteristics, such as “onset, magnitude, and shut-off.” This situation subjects the individual to abnormal stress and strain in the already aggravated ligaments, mechanoreceptors, and muscles exerting increased strain on the facet joints. Since spinal ligaments do not have great healing ability, chronic back pain occurs due to eventual inflammation of the neural tissues.<sup>4</sup>

The interspinous ligaments are the most common site of injury.<sup>5</sup> Commonly, interspinous ligamentous strain arises from acts of lifting, twisting, catching a falling heavy object, or falling in an awkward manner and landing with a twisted posture.<sup>6</sup> In our case, the patient was a mason by occupation where lifting heavy objects is common and this might be the cause of the ligament injury. Usually, patients experience acute onset of pain along the midline of the lower back. The pain is exacerbated during forward flexion of the lumbar spine. In most cases, tenderness, assessed by physical examination, is maximal over the interspinous ligaments, but the patient may also have accompanying paraspinal muscle spasms.<sup>5</sup>

The patient typically reports a central locus of pain along the vertebral column. This pain is accompanied by a stereotypic referred pain pattern in a more distal area. The centralized pain along the vertebral column is usually constant, but the referred pain pattern is affected by changes in ligamentous stretch. There is a significant increase of referred pain intensity if the ligament is mechanically stretched (often used diagnostically by a round key ring applied over the ligament site), and there is a significant decrease in the intensity of pain when the stretch is decreased. There will be palpation tenderness over the involved interspinous ligament, but not in the areas exhibiting the referred pain.

Strain (excessive shearing force or traction stretching) of an interspinous ligament is reported to cause localized and referred pain patterns. These referred pain patterns occur without the signs or symptoms of trigger point, extrafusal muscle strain, visceral referred pain, or nerve root irritation.

There was a study done on Bastrup's disease involving interspinous ligament wherein low back pain scores tremendously improved immediately after injection of

the agents into interspinous ligaments and the patients followed up for 1 year showed that scores significantly improved as compared with before the treatment. They concluded that lidocaine and dexamethasone administration into interspinous ligament in patients diagnosed with Bastrup's disease is effective for managing the pain associated with this disease.<sup>6</sup>

In another case of Bastrup's disease, fluoroscopically guided interspinous injection of 20 mg of triamcinolone acetate with local anesthetic was done. The patient remained pain free for 3 months.<sup>7</sup>

Injection of a local anesthetic into the interspinous ligament under fluoroscopy will help in making the diagnosis. Magnetic resonance imaging may not correlate with the pain.<sup>8</sup>

Thus, we conclude that this uncommon but potential cause of low back pain which is difficult to diagnose by imaging studies can be diagnosed by local infiltration of anesthetic drug or steroid, which leads to pain relief as well.

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