

Low back pain, radiculopathy, and bilateral proximal hamstring ruptures: a case report

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ABSTRACT

Low back pain (LBP) is a common complaint in the United States, with an incidence of 6.3%–15.4% and yearly recurrence in 54%–90% of patients.¹ Trends show more frequent diagnostic testing, opioid use, and surgical intervention as the incidence of LBP increases.² LBP is defined as pain at and near the lumbosacral region that can vary with physical activity and time.³

LBP is usually related to pathology of muscles, ligaments, spinal column joints, nerve roots, and the spinal cord. During the assessment of LBP, practitioners must also consider less common causes of pain in that region. For instance, patients with indolent or nighttime pain may have infectious or malignant processes. Referred pain from injuries to pelvic musculature or abdominal contents should be considered, especially following a traumatic event. One of these injuries, which can present as acute low back pain, is rupture of the proximal hamstring tendon. On rare occasion, concomitant LBP, radiculopathy, and hamstring injuries can occur. This diagnostic challenge is described in the following case.

KEYWORDS: Proximal hamstring rupture; low back pain; radiculopathy

CASE REPORT

A 46-year-old woman was seen for an initial rehabilitation medicine evaluation four years after slipping on a wet floor, catching herself, and not falling. She acutely developed sharp pain in her right hip, posterior thigh, and buttock. Her non-radiating pain was rated as 6/10 and worsened with movement and walking. Her relevant past medical and surgical history included back pain, hyperlipidemia, anxiety, depression, diverticulosis, and left shoulder rotator cuff surgery. She drank alcohol rarely and smoked one pack of cigarettes per day. Examination by an Emergency Department physician revealed pain with palpation at the buttock and posterior thigh. She was diagnosed with a muscle strain and myofascial pain and treated with ibuprofen, diazepam, and intramuscular ketorolac.

A week after the injury, she had persistent burning, stabbing pain in her right buttock, a positive straight leg raise at 10-20 degrees, and a mild limp. Her primary care physician

prescribed oral methylprednisolone and acetaminophen/propoxyphene. A magnetic resonance imaging (MRI) scan of her lumbar spine revealed mild degenerative changes of the disc spaces, but no significant narrowing of the spinal canal or neural foramina. There was hypertrophy of the facet joints at L4-L5, and a broad-based disc bulge at L4-L5 with mild narrowing of the neural foramen.

A month after her injury, she needed acetaminophen/propoxyphene three times a day. Her physician felt that her near-fall had worsened an asymptomatic spinal condition. Her physical therapy included trunk flexion and extension, spinal massage, stretching, ultrasound to the piriformis muscle, moist hot packs, and iontophoresis to the right hip. The pain initially decreased but persisted.

An orthopedic surgeon noted a short stride length on the right, tenderness at the posterior right greater trochanter and the sciatic nerve, and right hip pain with flexion of the lumbar spine. The surgeon felt that the disc bulge at the L4-L5 level and trochanteric bursitis were the likely cause of her radiculopathic symptoms; he injected the trochanteric bursa with methylprednisolone and bupivacaine, with some improvement in pain.

At follow-up with the surgeon six months after the near-fall, she still had tenderness in the ischial tuberosity and greater trochanter. Her symptoms worsened with adduction across the midline and hip flexion. An MRI of the pelvis revealed tendon ruptures: small fluid collections underlying the origin of the conjoined tendon of the hamstring tendon bilaterally, left greater than right (**Figure 1**). An EMG/NCV study revealed radiculopathies at the L4 and L5 nerve roots, with fibrillations at the L4 and L5 paraspinals, the right anterior tibialis, and the left peroneus longus muscle.

DISCUSSION

Acute hamstring injuries are commonly experienced by athletes.⁴ The semitendinosis, semimembranosus, and biceps femoris tendons originate on the ischial tuberosity and are at risk of injury with eccentric contractions during hip flexion and knee extension.⁵ Proximal hamstring ruptures represent 9% of all hamstring injuries.⁶ Ruptures occur in adults at the myotendinous junction; however, patients aged 16-25 years may sustain an avulsion fracture of the ischial apophysis.⁷ Hamstring ruptures may occur in elite or middle-aged recreational athletes.⁷ Injuries have been reported

Figure 1. MRI images showing bilateral proximal hamstring ruptures from the ischial tuberosity (arrowheads). The tears are the white signals noted by the arrows; a normal tendon would be gray/black.



during water-skiing, running, soccer, American football, ice hockey, dancing, tennis, wrestling, and bull-riding as well as during slip and falls.^{8,9} Timely evaluation of possible proximal hamstring injuries within 48 hours may avoid a delay in diagnosis.¹⁰

Patients with hamstring injuries complain of acute shooting pain in the posterior thigh. They may have a stiff-legged gait pattern in order to limit painful hip and knee flexion during ambulation.⁵ Physical examination often reveals tenderness over the ischial tuberosity as well as ecchymosis due to hematoma formation. Depending on body habitus, a palpable step-off may be present at the location of the tear; however, this is not a reliable sign of injury. The bowstring sign may be the best way to distinguish between complete and partial tears and was present in 23/23 patients with complete tears.⁹ It is present if there is no palpable tension in the distal hamstrings with the patient prone and the knee flexed to 90 degrees.

Neurological testing of the lower extremity is important, as chronic hamstring ruptures can present with sciatic neuralgia.⁸ Chronic injuries may also present with “hamstring syndrome,” or local posterior buttock pain over the ischial tuberosity. In one series of chronic hamstring injuries, 52/59 patients experienced relief of their symptoms following surgical release and nerve decompression.¹¹ Peroneal nerve function must also be assessed; injury to this nerve can result in foot-drop or weak ankle eversion.⁷

Radiographs will often be negative, although a small avulsion of the ischial tuberosity is possible. MRI is the gold standard and can distinguish complete versus partial

rupture, allowing for grading of the injury. Grade 1 injuries show only muscle edema on MRI with no architectural disruption of the muscle while Grade 2 and 3 represent partial and complete tears, respectively.⁵ Modifications to this grading system include sciatic nerve tethering and the degree of muscle retraction, with > 2 cm being a relative indication for surgery.¹² Ultrasound may be useful as a diagnostic tool but is operator-dependent. In one study, MRI diagnosed hamstring strain in 70% of patients while ultrasound correctly identified 75%.¹³ At six weeks, MRI identified 35.7% of patients with abnormalities compared to 22.2% for ultrasound. MRI may be superior to ultrasound for follow-up imaging but either appears acceptable for initial diagnosis.¹³

The treatment of proximal hamstring ruptures depends on the patient and expectations for future activities. Cohen *et al.* suggested a treatment algorithm based on MRI findings.⁵ Acute single tendon tears with retraction 1-2 cm tend to scar and adhere to the intact tendons; they are managed conservatively with relative rest for 6 weeks, with likely return to full strength.⁵ Tears of all three proximal hamstring tendons often result in significant retraction of ≥ 5 cm, and these injuries should be managed operatively, especially in high-level athletes.⁵ There is currently no consensus on the management of two-tendon proximal hamstring tears. Some recommend surgical treatment of two-tendon proximal hamstring ruptures with ≥ 2 cm of retraction in patients younger than 50 who are recreational athletes; these patients may have an injury to the third hamstring muscle at the musculotendinous junction that is not apparent on MRI.⁵ Failure to repair may result in chronic pain, weakness, and dysfunction.

Systematic reviews of outcomes after surgical repair of proximal hamstring rupture favored surgical repair in retracted, complete proximal hamstring tears but noted the paucity of higher level studies.^{14,15}

Conservative management of proximal hamstring ruptures consists of relative rest with modalities including ice, ultrasound, electrical stimulation, non-steroidal anti-inflammatory medications, and gentle stretching with progression to therapeutic exercise and gradual return to sports.⁵

Most cases of LBP will resolve with conservative therapy. LBP has been attributed to injury, disc herniation, stress, weather, and aging but may have a psychosomatic component.¹⁶ Nerve entrapment is over-diagnosed and leads to an overuse of surgical intervention.¹⁷ Neurological abnormalities in strength, sensation, and reflexes, especially with bowel or bladder dysfunction, require prompt surgical evaluation and treatment in order to avoid complications of cauda equina syndrome. In our patient, neurological and radiological abnormalities were accompanied by EMG findings of radiculopathy but she was safely treated in a conservative manner.

SUMMARY

Proximal hamstring ruptures can be a source of low back pain and disability for both young, athletic patients who sustain an injury during sports as well as older patients who sustain a fall. Treatment options range from conservative measures with gradual resumption of activity to surgical repair of the ruptured tendons. In our patient, the diagnosis of hamstring tendon injuries was complicated by low back pain and radiculopathy. Co-existent neurological and musculoskeletal conditions can create a diagnostic challenge, but vigilance for these rare situations leads to better diagnosis and treatment.

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