

Entrapment Neuropathy of the Lateral Femoral Cutaneous Nerve: Cause of Lateral Knee Pain

JAMES R. BEAZELL, MS, PT, ATC*

This study describes the anatomy and causes of mechanical impingement of the lateral femoral cutaneous nerve, as well as the clinical findings. A female bicyclist presented with a history of lateral knee pain which was treated with stretching, arthroscopy, and change of activity. Evaluation revealed a neuropathy of the lateral femoral cutaneous nerve. The patient was treated with a heel lift and has returned to competitive cycling.

The clinician's role in determining the cause of pain is dependent upon the knowledge of anatomy. The area of pain can be misleading in those instances of referred pain. The following case study identifies a neuropathy which was mistaken for lateral knee pain.

ANATOMY

The lateral femoral cutaneous nerve derived from the L2-L3 lumbar roots, emerges from the lateral border of the psoas major muscle to run down and laterally around the pelvis lying on the iliacus muscle. It goes forward to the lateral end of the inguinal ligament. The nerve at first lies under the iliacus fascia. It then enters and runs between the fascial layers a short distance just before going through an opening or tunnel in the lateral attachment of the inguinal ligament to the anterior superior spine. Beyond its opening in the inguinal ligament, the nerve is beneath the deep fascia of the upper thigh for a short portion of its course, piercing it to reach its final sub- and intracutaneous position, about 5 inches below the anterior and posterior branches. The anterior branch innervates the skin over the lateral and posterior portions of the thigh from the trochanteric region to the middle of the thigh. There are no branches to neighboring muscles.²

The entrapment point is at the anterior superior

spine where the nerve passes through the lateral end of the inguinal ligament (Fig. 1, point A). This is the binding point of the nerve. Past this point, the nerve is held down where it pierces the fascia lata at point B. Thus it can be seen from the diagrammatic representation, if the extremity is adducted (direction X) the nerve is tensed against the entrapment point. Body or trunk shifts (directions U and V) can also stress the nerve against this point.²

CASE HISTORY

The patient was a 30-year-old female with a history of right lateral knee pain. Initial incidence of pain was related to running. The patient ran approximately 30-40 miles per week and participated in 10 km races. Three years previous the patient began to have right lateral knee pain which went away with rest, but worsened with running. After 1 year of increasing symptoms the patient saw a physician who diagnosed iliotibial band syndrome.

The patient did stretches but continued to have lateral knee pain. She obtained a second opinion and arthrogram. The second physician proposed arthroscopic surgery to rule out meniscal tear. The surgery was done with no findings. Subsequent to the surgery, the patient took up cycling which did not cause discomfort. As the patient began to increase distance and intensity of cycling she reported numbness of the right anterior thigh.

The patient was seen by the author to screen for lumbar problems. On evaluation, the iliac crest

* Director of Physical Therapy, Institute of Sportsmedicine at St. Mary's Hospital, 2235 Hayes Street, San Francisco, CA 94117.

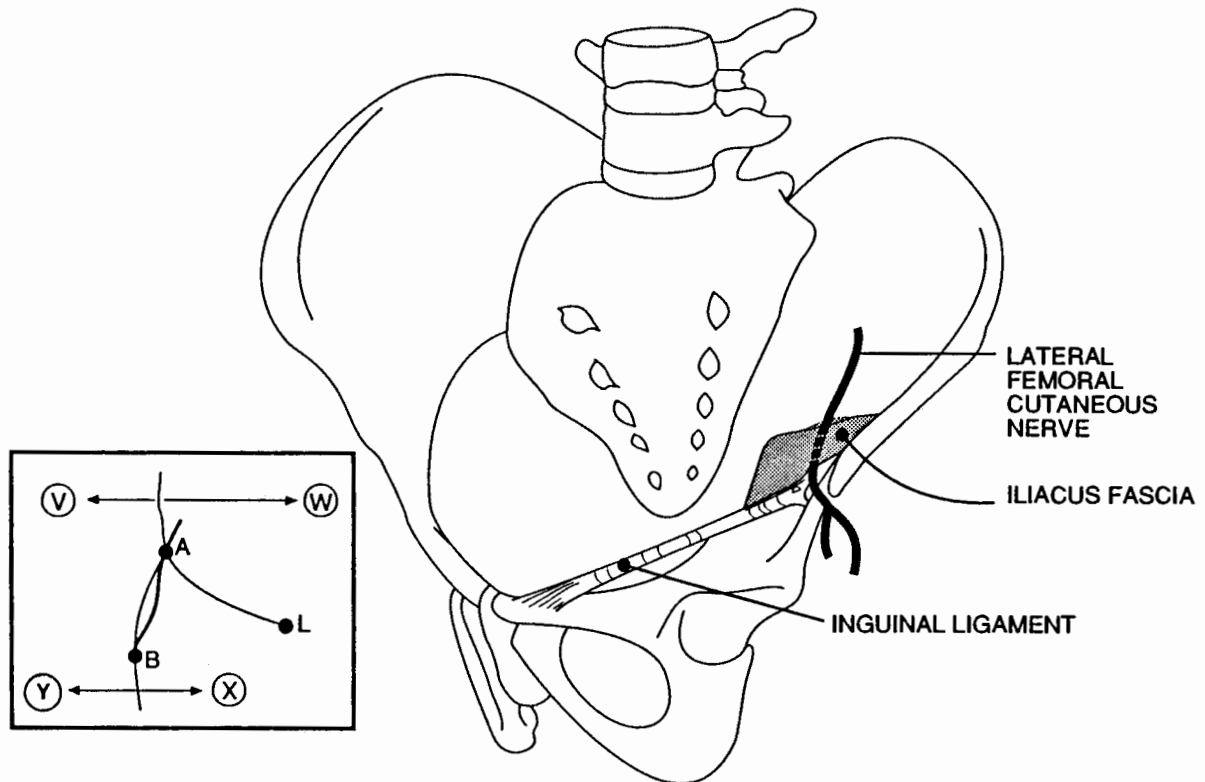


Fig. 1. Anatomical relations of lateral femoral cutaneous nerve. Note course in iliacus fascia. (Modified from Koppel HP, Thompson WAL, *New Engl J Med* 262:56-60, 1960.) A: Entrapment point—at the anterior superior iliac spine where the nerve passes through the lateral end of the inguinal ligament. B: Where the lateral femoral cutaneous nerve pierces the fascia lata. V, W: Directions of body or trunk shifts. Y, X: Direction of adduction, abduction of the extremity. L: The attachment of the inguinal ligament to the ramus of the pubis.

heights were unequal with the right being higher. (Sacral flexion test done in standing was negative.) Iliac crest heights were equal in sitting and the sacral flexion test was negative. Supine leg length was unequal with the left being shorter. All other pelvic landmarks were equal. Prone leg length was also unequal with the left being shorter but pelvic landmarks were equal. Lumbar screening including manual muscle testing and reflexes were negative. The patient did have decreased sensation in the right lateral thigh from approximately the right greater trochanter to the lateral knee in a 2-3 inch band. Quadrant test of the lumbar spine was negative. Laseque's and Kernig's tests were negative. The patient reported an increase in symptoms with pressure on the iliacus muscle in the area of the inguinal ligament attachment. The assessment of leg length was done

according to Hoppenfeld.¹ Both apparent leg length discrepancy and true leg length showed the left leg to be approximately 1/2 inch shorter.

The patient was given a heel lift to wear in the left shoe. The patient's bicycle cleat was built up approximately 1/2 inch. The patient's symptoms have disappeared and she has resumed cycling training without complaints.

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