Diagnosis and Treatment of Genitofemoral and Ilioinguinal Neuralgia

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During the past 8 years, a total of 36 patients were diagnosed as having either ilioinguinal or genitofemoral neuralgia. A multidisciplinary approach (surgeon, neurologist, anesthesiologist) as well as local blocks of the ilioinguinal nerve or paravertebral blocks of L1,2 were essential to determine which nerve was likely to be entrapped. Seventeen of the 19 patients having a diagnosis of ilioinguinal neuralgia after previous inguinal herniorrhaphy were completely free of pain after resection of the entrapped portion of the nerve. Seventeen patients were diagnosed as having genitofemoral neuralgia after previous inguinal herniorrhaphy, blunt abdominal trauma, or another operation. Neurectomy of the genitofemoral nerve proximal to the entrapment controlled the persistent pain in 12 of 17 of these patients. Ilioinguinal or genitofemoral nerve entrapment neuralgias are rare complications of operations in the inguinal region. When the diagnosis is made by a multidisciplinary approach, neurectomy is frequently successful in relieving severe pain and paresthesias without serious morbidity.

Persistent pain (neuralgia) and burning sensations (paresthesias) in the inguinal region caused by genitofemoral or ilioinguinal nerve entrapment after inguinal herniorrhaphy, appendectomy, or lower quadrant blunt trauma are rare, but, when persistent, may result in severe morbidity. It is well known that the ilioinguinal nerve can be unintentionally injured during inguinal herniorrhaphy. Transient anesthesia or pain and paresthesias in the distribution of the ilioinguinal nerve are not uncommon postoperative occurrences. Persistent postoperative pain or paresthesia may occasionally occur. Entrapment of the ilioinguinal nerve may be caused by either suture placement, fibrous adhesions, or a cicatrical neuroma. Recexploration of an inguinal hernial incision to perform a neurectomy or neurolysis or to remove a neuroma involving the ilioinguinal nerve is occasionally indicated. Persistent pain after a remedial operation on the ilioinguinal nerve suggests entrapment of neighboring sensory nerves.

The syndrome of genitofemoral neuralgia (causalgia) was first reported by Magee [1] in 1942 and by Lyon [2] in 1945. Most surgeons are unaware of this entrapment neuralgia, and only 25 instances have been reported in the world's literature (Table 1) [1–6]. It is thought that fibrous adhesions entrap small branches and twigs of this nerve in the region of a previous operation or blunt trauma. Many patients who suffer from genitofemoral neuralgia have had their chronic inguinal pain managed by repeated local injections, nerve stimulators, pain medications, and numerous surgical attempts to alleviate the pain. Their condition is often misdiagnosed as neurosis or malingering.

Since 1980, a total of 19 patients with the diagnosis of ilioinguinal neuralgia and 17 patients with genitofemoral neuralgia underwent surgical intervention at the University of Wisconsin Clinical Science Center. All of these patients were referred after previous operations, multiple physician consultations, or attempts at pain management. This article reviews our experience and recommendations for the diagnosis and management of these 2 unusual and difficult clinical problems.

Anatomy

The inguinal region, which includes the inguinal canal, spermatic cord, and surrounding skin and subcutaneous tissue (including the femoral triangle of Scarpa), receives sensory innervation from the eleventh and twelfth thoracic nerves and the ventral divisions of the first and second lumbar spinal nerves. The cutaneous branches of the lumbar plexus include the iliohypogastric, ilioinguinal, genitofemoral, lateral femoral cutaneous nerves, and the obturator nerves (Fig. 1). The sper-
matic sympathetic plexus contains the sensory fibers for the testes.

The genitofemoral nerve arises from the first and second lumbar vertebral plexus and consists mainly of sensory fibers with a motor component to the cremaster muscle (cremasteric reflex). It lies within the fascial lining of the abdomen by piercing the psoas muscles and psoas fascia near its medial border opposite the third or fourth lumbar vertebra (Fig. 2). It descends under the peritoneum on the surface of the psoas major and crosses obliquely behind the ureter. At a variable distance above the inguinal ligament, the nerve divides into the genital (external spermatic) and femoral (lumboinguinal) branches. Great variation of the sensory nerves to the inguinal region is not uncommon, there being communication between branches of the genitofemoral, ilioinguinal, or iliohypogastric nerves. The femoral branch (lumboinguinal) is the cutaneous nerve to the femoral triangle. Branches of the femoral branch descend laterally to the external iliac artery, behind the inguinal ligament, and through the fascia lata into the femoral sheath. The femoral branch supplies the skin over the upper part of the femoral triangle and communicates with the intermediate cutaneous nerve of the thigh. The genital branch (external spermatic) crosses the lower end of the external iliac artery and enters the inguinal canal through the internal (deep) inguinal ring. It supplies the cremaster muscle and traverses the inguinal canal to the end of the skin of the scrotum. In women, the genital branch accompanies the round ligament of the uterus and ends in the skin of the mons pubis and labium majus.

The ilioinguinal nerve is formed by the first lumbar nerve with contributing filaments from the twelfth thoracic nerve (Fig. 1). The ilioinguinal nerve runs subperitoneally and emerges from the lateral border of the psoas major before piercing the transverse abdominal muscle near the anterior part of the iliac crest (Fig. 2). It gradually pierces and gives fibers (motor) to the internal oblique muscle and lies between it and the external oblique muscle close to the internal inguinal ring. Within the inguinal canal, the nerve lies below the spermatic cord and accompanies it through the external inguinal ring. The ilioinguinal nerve is distributed to the skin of the superomedial area of the thigh, to the skin over the root of the penis and anterior scrotum, or to the mons pubis and labium majus. A frequent anatomic variation is an aberrant inguinal sensory trunk of the ilioinguinal nerve, which descends within the genital branch of the genitofemoral nerve. It is also important to recognize that the iliohypogastric nerve is formed from the identical nerve roots as the ilioinguinal nerve and has nearly identical sensory innervation. The size of the ilioinguinal nerve is inversely proportional to the iliohypogastric nerve. In some patients, the ilioinguinal nerve joins the iliohypogastric nerve, the latter joins the former, or one of the nerves is entirely absent [7].

Diagnosis

The main clinical features of genitofemoral entrapment neuralgia consist of intermittent or constant pain and burning sensations in the inguinal region with radiation of pain to the skin of the genitalia and upper medial thigh. The pain can frequently be aggravated by walking, stooping, or hyperextension of the hip, and may be helped by recumbency and flexion of the thigh [3]. Tenderness along the inguinal canal or the inguinal rings may be detected, and hyperesthesia in the distribution of the nerve may be present. The major differential diagnosis of genitofemoral neuropathy is entrapment of the ilioinguinal nerve. The latter condition is characterized by symptoms similar to genitofemoral neuralgia with burning pain over the lower abdomen, which