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Pulsed radiofrequency for the treatment of chronic ilioinguinal neuropathy

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Abstract

Background—Ilioinguinal neuropathy is a rare but disabling condition. The condition may arise spontaneously or in the setting of pelvic surgery. To date, most therapeutic options have been limited to neuropathic pain medications, anti-inflammatory medications, nerve blocks with local anesthetics, or neurectomy. Long-term results of non-surgical interventions are fair at best. We present a case of chronic ilioinguinal neuropathy treated with pulsed radiofrequency.

Objective—To examine the efficacy of pulsed radiofrequency (PRF) lesioning on pain in ilioinguinal neuropathy.

Method—A 58-year old man with chronic ilioinguinal neuropathy was treated with PRF and was followed for 3 months.

Results—The patient had significant pain relief at 3 months follow up.

Conclusion—Pulsed radiofrequency lesioning may be a good treatment for chronic ilioinguinal neuropathy in cases refractory to conservative management.

Keywords

Pulsed radiofrequency; Ilioinguinal neuropathy

Introduction

Ilioinguinal neuropathy is an entrapment syndrome that is hypothesized to result from mechanical compression of the ilioinguinal nerve. The disorder is characterized by sharp, shooting pain originating at the anterior superior iliac spine and radiating to the groin. Anatomically the entrapment is thought to occur as the nerve passes deep to the transverse abdominis muscle, just medial to the anterior iliac spine. In addition to spontaneous cases the disorder has been associated with inguinal herniorraphy [1] and other pelvic surgeries [2–4]. Ilioinguinal neuropathy in postoperative patients may be secondary to fibrous

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adhesions, neuroma formation, or suture placement [5]. Treatment has been limited to nerve blocks with local anesthetics, surgical decompression, or neurectomy [6,7]. Injections with steroid medication have not been shown to be effective [8]. Although local anesthetic injections over the ilioinguinal are helpful in diagnosis of the syndrome, there is no evidence they provide long-lasting relief. A recent article has demonstrated that pulsed radiofrequency (PRF) may be effective in the treatment of ilioinguinal pain when applied to the higher lumbar nerve roots; there is, however, no documentation of PRF used directly over the ilioinguinal nerve in the setting of chronic ilioinguinal neuropathy [9]. We report a case of chronic ilioinguinal neuropathy that was successfully treated with PRF lesioning of the ilioinguinal nerve.

Case

A 58-year-old male runner presented with a three-year history of persistent left groin pain after he apparently ran into a street sign that jammed into his left groin region. After the injury, he underwent a left sacroiliac joint steroid injection, left hip flexor trigger point injections, and subsequently was scheduled for attempted herniorrhaphy (no hernia was found, however). Diagnostically, the patient had ultrasound, spine and pelvic MRIs, and a pelvic CT scan, which did not reveal any pathology. Just before his visit the patient underwent manipulations by a chiropractor and by an osteopathic physician, without any relief. The patient had also received acupuncture, massage, a TENS unit, and several medications including codeine, amitriptyline, and catapres patch, none of which had significant effect on his pain.

The pain was described as severe, stabbing, and just left lateral to the anterior superior iliac spine, with an intensity of 10/10 on VAS (visual analog scale). Provocative factors included coughing, heavy lifting, sneezing, squatting, lifting, or walking up stairs. There were no palliative factors. He is no longer able to run. He denies any numbness, tingling, or weakness in his lower extremities. There is no radiation of the pain to his lower extremities.

On physical examination the patient had 5/5 motor strength in all lower extremity myotomal distributions. Sensory examination was slightly decreased to cold temperature on the left side in the L1 dermatome, but otherwise was intact to fine touch and pin prick. Cremasteric reflex was intact bilaterally. The pain was not exacerbated by valsalva maneuver. The other reflexes were +3 but symmetric in the patellae and achilles tendons. There was a positive tinel sign over the left anterior superior iliac spine that reproduced his symptoms.

The patient was diagnosed with ilioinguinal neuropathy and underwent diagnostic ilioinguinal injections with 1% lidocaine that gave him significant but temporary relief. He then returned to our institution for a PRF lesioning procedure on the left ilioinguinal nerve.

A neurotherm radiofrequency thermocouple machine (model JK25T) was used for the procedure. The patient's left groin area was prepped with Betadine 3× and draped in a sterile manner. We made an anesthetic skin wheal 2 cm medial and 2 cm inferior to the anterior superior iliac spine with a 27-gauge needle and 1% lidocaine. We then advanced the 3.5-in. Stimuplex needle in superior and lateral directions while stimulating at 50 Hz and 1.4 mA until paresthesias of the patient's ilioinguinal nerve concordant with his area of pain was obtained. Initially, stimulation of the lateral femoral cutaneous nerve was observed. The needle was readjusted until the stimulation occurred in the area concordant with pain going down to the groin area. This initial stimulation was at 50 Hz and 1.4 mA. The area was then treated with PRF ablation for 2 min at 42°C, 2 Hz cycle, and 20 ms treatment. Four additional stimulations were given after manipulation of the needle.

At each treatment interval stimulation was obtained before each treatment at 50 Hz and between 0.85 and 1.3 mA. After the last treatment, a 10-mL solution was injected after a negative aspiration in the following manner. Five milliliters was injected at the area of the last PRF treatment, the needle was then fanned along the ilioinguinal canal inferiorly and posteriorly and an additional 5 mL of the mixture was injected. The mixture contained 2 mL 40 mg mL^{-1} Depo-Medrol and 8 mL 0.5% bupivacaine. The patient tolerated the procedure well. He reported a VAS = 8/10 before procedure and a VAS = 2/10 at the end of procedure. He also reported that his pain had decreased significantly after our last PRF Ablation and before injection of Depo-Medrol and bupivacaine. At the 3-month follow up, the patient's VAS remained low at 3/10 both at rest and with exercise (running).

Discussion

Ilioinguinal neuropathy is a rare but painful condition. Diagnosis of ilioinguinal neuropathy is difficult and based on history, physical examination, and alleviation of pain by a diagnostic nerve block. It is difficult to discriminate between ilioinguinal and iliohypogastric neuropathies because of their common origin (T12 and L1 nerve roots) and close proximity. In contrast with the ilioinguinal nerve, however, the cutaneous distribution of the iliohypogastic nerve does not usually extend into the groin or scrotum. The discrimation is, therefore, primarily clinical. Sports hernia is another possible etiology of groin pain. Groin pain from sports hernias are usually worsened by valsalva maneuver. In our patient the pain was not exacerbated by valsalva maneuver and was alleviated by injection of lidocaine over the ilioinguinal nerve.

Therapeutic options up to this point have been limited to neuropathic pain medications, anti-inflammatory medications, nerve blocks with local anesthetics, or neurectomy. Long-term results of non-surgical interventions are fair at best.

Pulsed radiofrequency is a relatively new technique for treatment of neuropathic pain. PRF uses short bursts of thermal energy to modulate neural impulses, but the exact mechanism of action has not been established. PRF may produce transient inhibition of evoked synaptic activity; when compared with continuous radiofrequency lesioning the effect is thought to incur less distance-dependent neural damage [10]. Interestingly, a study comparing the efficacy of continuous radiofrequency lesioning with PRF on the cervical dorsal root ganglia showed that both procedures equally increased the number of c-Fos immunoreactive cells in the dorsal horn [11]. PRF may be effective in the treatment of suprascapular neuropathy, but there are no reports of its use in chronic ilioinguinal neuropathy [12]. Because PRF offers the possibility of neuro-modulation at significantly lower temperatures than continuous radiofrequency lesioning (with less neural damage), it remains a very attractive therapeutic option. Use of PRF in the setting of chronic peripheral neuropathy is still in its infancy. Further randomized controlled studies examining the effect of PRF in this and other peripheral neuropathies will obviously be required.

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