Volume: 24, Issue: 2, April 2013 pp.: 131-134 ORIGINAL ARTICLE / ORJİNAL MAKALE

AN ALTERNATIVE METHOD FOR THE TREATMENT OF LUMBAR DISCOGENIC PAIN: INTRADISCAL ELECTROTHERMAL THERAPY (IDET)

LOMBER DİSKOJENİK AĞRI TEDAVİSİNDE ALTERNATİF YÖNTEM: DİSK İÇİ ELEKTROTERMAL TEDAVİ (IDET - INTRADISCAL ELECTROTHERMAL THERAPY)

Selçuk ÖZDOĞAN[1],
Ali Haluk DÜZKALIR[2],
İsmail İŞTEMEN[2]

[1]*Brain and Neurosurgery Specialist, Department of Brain and Neurosurgery, Yeditepe University Faculty of Medicine, Istanbul.*
[2]*Brain and Neurosurgery Specialist, Brain and Neurosurgery Clinic, Mus State Hospital, Mus.*

SUMMARY

Introduction: Musculoskeletal system diseases are the main cause for a patients' loss of ability to work. The most commonly seen aspect of these diseases is lumbosacral pathology. Discogenic pain is responsible in some cases. As well as conservative and surgical treatments, intradiscal electrothermal therapy could be an alternative minimally invasive treatment option.

Materials and Methods: We retrospectively observed 21 patients who were treated using intradiscal electrothermal therapy. They were scored using the Visual Analog Scale before surgery. They were recalled one month later for a follow-up and scored again. The differences between the scores were calculated to assess pain release, and a percentage decrease in pain was found.

Results: As a result of the one month follow-up, it was found that the patients' complaints decreased 77.8%, according to the Visual Analog Scale scores.

Conclusion: Intradiscal electrothermal therapy could be a valid minimally invasive treatment option for patients without surgical indications who see no improvement with conservative treatment options.

Key words: Lumbar disc disease, surgical treatment, intradiscal electrothermal therapy, IDET

Level of evidence: Retrospective clinical study, Level III

ÖZET

Giriş: Günümüzde en çok iş kaybına sebep olan hastalık grubu kas-iskelet sistemi hastalıklarıdır. Bu hastalıkların da en sık görülen bulgularından biri bel ağrısıdır. Bel ağrısının sebepleri arasında lomber diskojenik ağrı yer almaktadır. Tedavide konservatif ve spinal cerrahinin yanısıra lomber diskopati seviyesine uygulanabilen elektrotermal terapi yöntemi de göz ardı edilmemelidir.

Materyal-Metot: Yapılan retrospektif araştırmamızda disk içi elektrotermal tedavi uygulanmış 21 hasta incelenmiştir. Hastaların işlem öncesi ağrı skorlaması vizüel analog skala kullanılarak alınmıştır. Hastalar işlem sonrası 1 ay takip edilmiş ve tekrar kontrole çağrılmıştır. Tekrar vizüel analog skorları alınmış, skorlar arasındaki fark hesaplanmış ve ağrı azalma yüzdeleri bulunmuştur.

Sonuçlar: Hastaların 1 aylık takipleri sonucu vizüel analog skala değerlerine göre şikayetlerinin % 77.6 oranında azaldığı görülmüştür.

Çıkarım: Disk içi elektrotermal terapi, konservatif yöntemlerden fayda görmeyen ve kesin cerrahi endikasyonu konulmamış hastalar için minimal invaziv ciddi bir tedavi seçeneği olarak göze çarpmaktadır.

Anahtar Kelimeler: Lomber disk hastalığı, cerrahi tedavi, disk içi termal tedavi, IDET

Kanıt Düzeyi: Retrospektif klinik çalışma, Düzey III

Address: Op.Dr. Selçuk Özdoğan, Neurosurgery clinic, Yeditepe University Hospital, Devlet Yolu Ankara caddesi, No:102, İçerenköy, İstanbul.
Tel: 0506 763 71 73
E-mail: drselcukozdogan@hotmail.com
Received: 1st March, 2013
Accepted: 1st April, 2013

INTRODUCTION

Nowadays, the group of diseases that cause the most significant losses to a patient's ability to work are musculoskeletal disorders[3,10,11]. One of the most common symptoms of these diseases is lower back pain. The causes of back pain include lumbar discogenic pain, radiculopathy, facet joint disorders, pain after back surgery, muscle-tendon disorders, sacroiliac joint diseases and neuropathic pain, with lumbar disc induced radiculopathies occurring most commonly[5,10,12,20,21].

Direct spinal radiographs, computed tomography and electromyography are used for diagnosis, but the gold standard is magnetic resonance imaging (MRI).

As well as anti-inflammatory and myorelaxant medications, physical therapy, and spinal surgery, the intradiscal electrothermal therapy (IDET) method, applicable to the lumbar disc levels, should not be ignored.[1,2,6,10].

MATERIALS AND METHODS

In our retrospective study, 21 patients were examined who received IDET due to lower back pain or radiculopathy between August 1, 2012 and February 1, 2013 in Mus State Hospital.

The patients included in this study were those who received medical treatment and physical therapy due to lower back pain or radiculopathy but saw no benefits, and whose pain value on the visual analogue scale (VAS) was 7 or higher. One of the patients underwent a lumbar discectomy operation at the disc level to be processed. There was no extruded or sequestered disc herniation in the MRI evaluations of the patients.

SURGICAL TECHNIQUE

Patients received surgery with light sedation and local anesthesia. After antibiotic prophylaxis, patients were positioned face-down on the operating table. After positioning, the area for application was washed with batticon and covered with a sterile covering. The midline was determined by marking the spinous processes. The distances and application locations were marked using fluoroscopy.

Local anesthetic was given to the area to be processed from about 8 cm lateral to the midline. The guide needle reached the distance to be processed under fluoroscopy with the help of a side cross image. At this stage, the patients were conversed with and asked whether they felt leg pain. The guide was moved under the anteroposterior lumbar fluoroscopic image (Figure-1). The fluoroscopic image was changed laterally (Figure-2) and a thermal probe was sent through the guide. The foramen distance of the probe tip was controlled using fluoroscopy. Cooperation was established with the patients before beginning thermo-coagulation; sensory and motor electrical control signals were given. The patients were questioned and it was observed whether they had any pain, burning, or motor movement. In this way, the reliability of the location of the thermal probe was determined. Then, the IDET procedure was started using a radiofrequency method.

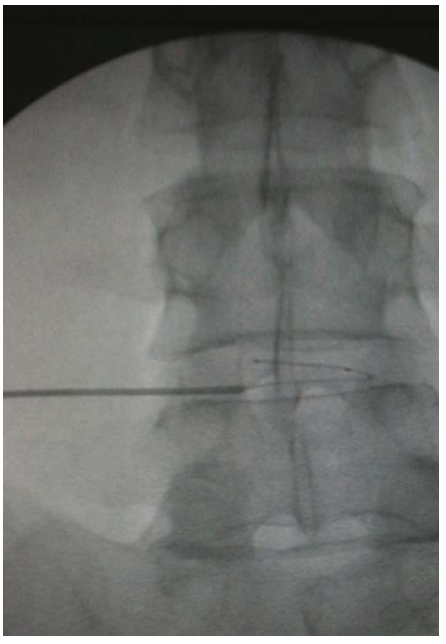

Figure 1.

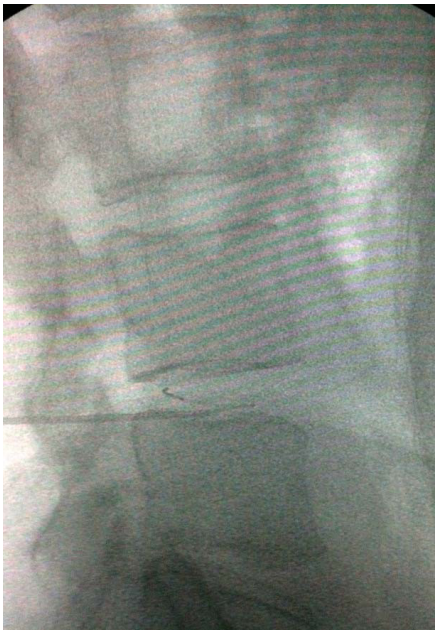

Figure 2.

During the procedure, cooperation was established with the patients and it was emphasized that notice should be given in case of pain and/or a burning sensation. A 12 minute radiofrequency thermocoagulation process was completed. The temperature probes were taken from within the guide and then the guide needle was withdrawn. No complications were observed in any of the patients.

FOLLOW-UP

The patients were discharged on the same day. One month after the IDET procedure, they were called for a follow-up, and the pain VAS scores were noted. The percentages of the differences between the values were calculated, and the average value was determined.

RESULTS

As a result of the one month follow-up of the patients, it was observed that the complaints decreased by 77.6% according to the pain VAS scores. It is remarkable that the pain of six patients was completely lost, and the pain of the patient who underwent previous surgery decreased by 77.8%.

DISCUSSION

Lower back pain is seen in 15–20% of the working community. This percentage reaches 28% in industrial workers[11,21] Complaints of back pain in 80% of the public can be seen at some point in their lives. This pain both causes loss of labor and impairs quality of life[4].

Discogenic pain is the most frequent cause of lower back pain. The reason for discogenic pain is the disruption of the structure of collagen within the disc and loss of the anatomical shape of the annulus fibrosis as a result. Loosening of the annulus fibrosis occurs with the loss of anatomical shape, and tears form at the more advanced stages. As a result of a full-stage tear, the nucleus pulposus migrates out from the disc space and applies forces to the dura and nerve roots. This pathology triggers the inflammatory mechanism and results in the formation of neovascularization and granulation tissue. These mechanisms make the pathological area more sensitive and painful[8,13-15].

The majority of back pain responds to conservative treatment. Patients who cannot be treated by resting and analgesic myorelaxants are recommended for physical therapy. 10% of patients do not respond to conservative treatment and become chronic, and have to consider more invasive methods. If the disc material with a lumbar MRI is seen to be highly protruded, extruded or subjected to sequestration, and these images are accompanied by neurological deficit in the patients, surgical treatment should be planned. Laminectomy, microdiscectomy and lumbar fusion can be considered as example surgical treatment options[11,21].

In general, less invasive treatment methods are preferable. IDET is an important minimally invasive treatment option for patients who did not benefit from conservative methods but are not diagnosed with precise surgical indications[7,16,19]. The results of our study correlate with data from similar studies in the literature, and reveal the importance of this option.

In a study that included 50 patients, Assietti et al. found that the rate of improvement at a 24 month follow-up after an IDET procedure was 78% for 39 of the patients, and an average of 66% for all patients, using an 11-point number scale and the Oswestry index[1].

In a study including 99 patients, Derby et al. found that leg pain decreased by 63.9% after the IDET procedure according to the VAS score[5].

In a study by Maurer et al., the VAS scores of 56 patients were evaluated after the IDET procedure after an average follow-up of 20 months, and the recovery rate of 42 patients was found to be 75%. This study also showed that the life quality of the patients increased and they benefitted from the process[10].

Nunley et al. followed 53 patients for 56 months using the VAS score and Oswestry test, and detected a 62.6% decline in symptoms according to the VAS scores, and a 69.3% decline in symptoms according to the Oswestry test[11].

Saal et al. evaluated 25 patients after IDET with the VAS and SF-36 physical function scales. According to the VAS scores, they reported that 80% of patients benefitted from the process. According to the SF-36 scoring, 72% of the patients significantly benefitted from the process. They subsequently conducted another study including 58 patients with a two year follow-up, and they examined the long-term results. After a two year follow-up, they showed that 72% of the patients benefitted from the process according to the VAS scores, and the life quality of 78% of the patients significantly increased according to the SF-36 test.[17,18].

Appleby et al. performed a meta-analysis of published articles related to IDET. They examined 17 published papers and classified the results according to the VAS, Oswestry and pain scales. This showed that the pain of the patients significantly decreased and their life quality increased after the IDET procedure[2].

The demographic characteristics of the patients, duration of symptoms and the conservative treatment received, placement

of the IDET catheter, catheter heat level, execution time, and experience of the person who applied the technique are the factors that explain the differences between the studies in the literature.

This study suggests that the IDET method is an important treatment option for patients who do not respond to conservative treatment, when patients are carefully selected.

REFERENCES

1. Assietti R, Morosi M, Block J. Intradiscal electrothermal therapy for symptomatic internal disc disruption: 24-month results and predictors of clinical success. *J Neurosurg Spine* 2010; 12: 320–326.
2. Appleby D, Andersson G, Totta M. Meta-analysis of the efficacy and safety of intradiscal electrothermal therapy (IDET). *Pain Medicine* 2006; 7(4): 308-316.
3. Bogduk N. The lumbar disc and low back pain. *Neurosurg Clin N Am* 1991; 2: 791–806.
4. Boswell MV, Trescot AM, Datta S, Schultz DM, Hansen HC, Abdi S, Sehgal N, Shah RV, Singh V, Benyamin RM, Patel VB, Buenaventura RM, Colson JD, Cordner HJ, Epter RS, Jasper JF, Dunbar EE, Atluri SL, Bowman RC, Deer TR, Hansen HC, Staats PS, Smith HS, Burton AW, Kloth DS, Giordano J, Manchikanti L. Interventional techniques: evidence-based practice guidelines in the management of chronic spinal pain. *Pain Physician* 2007; 10: 7–11.
5. Derby R, Lee SH, MD, Seo KS, Kazala K, Jo Kim B, Kim MJ. Efficacy of IDET for relief of leg pain associated with discogenic low back pain. *Pain Practice* 2004; 4: 281–285.
6. Ergün R, Sekerci Z, Bulut H, Dolgun H. Intradiscal electrothermal treatment for chronic discogenic low back pain: a prospective outcome study of 39 patients with the Oswestry dis- ability index at 18 month follow-up. *Neurol Res* 2008; 30: 411–416.
7. Freeman BJ, Fraser RD, Cain CM, Hall DJ, Chapple DC. A randomized, double blind, controlled trial: intradiscal electrothermal therapy versus placebo for the treatment of chronic discogenic low back pain. *Spine* 2005; 30: 2369–2377.
8. Kapural L, Mekhail N, Korunda Z, Basali A. Intradiscal thermal annuloplasty for the treatment of lumbar discogenic pain in patients with multilevel degenerative disc disease. *Anesth Analg* 2004; 99: 472– 476.
9. Levin JH. Prospective, double-blind, randomized placebo-controlled trials in interventional spine: what the highest quality literature tells us. *Spine J* 2009; 9: 690–703.
10. Maurer P, Block JE, Squillante D. Intradiscal electrothermal therapy (IDET) provides effective symptom relief in patients with discogenic low back pain. *J Spinal Disord Tech* 2008; 21: 55-62.
11. Nunley PD, Jawahar A, Brandao SM, Wilkinson KM. Intradiscal electrothermal therapy (IDET) for low back pain in worker's compensation patients: Can it provide a potential answer? Long-term results. *J Spinal Disord Tech* 2008; 21: 11-18.
12. Ohnmeiss DD, Vanharanta H, Ekholm J. Degree of disc disruption and lower extremity pain. *Spine* 1997; 22: 1600–1605.
13. Osti OL, Vernon-Roberts B, Moore R, Fraser RD. Annular tears and disc degeneration in the lumbar spine. A post-mortem study of 135 discs. *J Bone Joint Surg* 1992; 74-B: 678–682.
14. Pauza KJ, Howell S, Dreyfuss P, Peloza JH, Dawson K, Bogduk N. A randomized, placebo- controlled trial of intradiscal electrothermal therapy for the treatment of discogenic low back pain. *Spine J* 2004; 4: 27–35.
15. Peng B, Hao J, Hou S, Wu W, Jiang D, Fu X, Yang Y. Possible pathogenesis of painful intervertebral disc degeneration. *Spine* 2006; 31: 560–566.
16. Rozen D, Grass GW. Intradiscal electrothermal coagulation and percutaneous neuromodulation therapy in the treatment of discogenic low back pain. *Pain Practice* 2005; 5: 228–243
17. Saal JA, Saal JS. Management of chronic discogenic low back pain with thermal intradiscal catheter. *Spine* 2000; 25: 382–388.
18. Saal JA, Saal JS. Intradiscal electrothermal treatment for chronic discogenic low back pain: prospectiveoutcome study with a minimum 2-year follow-up. *Spine* 2002; 27: 966– 973.
19. Urrutia G, Kovacs F, Nishishinya MB, Olabe J. Percutaneous thermocoagulation intradiscal techniques for discogenic low back pain. *Spine* 2007; 32: 1146–1154 .
20. Von Korff M. Studying the natural history of back pain. *Spine* 1994; 19: 2041S–2046S.
21. Webster BS, Verma S, Pransky GS. Outcomes of workers' compensation claimants with low back pain undergoing intradiscal electrothermal therapy. *Spine* 2004; 29: 435–441.