

Regression of an extruded lumbar disc herniation after thermomechanical massage bed therapy

E Kaya¹, S Ozyurek², C Kaplan³, B Gokcen⁴, O Kose^{5*}

Abstract

Introduction

Many patients with extruded lumbar disc herniation require surgical intervention but some neurological symptoms of intervertebral disc herniation may often improve with conservative treatment. Although the spontaneous regression in size of a herniated disc is well known, a large extruded disc has been rarely reported. This case report discusses a regression of an extruded lumbar disc herniation after thermomechanical massage bed therapy.

Case Report

A 42-year-old man with a 1-month history of lower back and left leg pain was admitted to our Department. A large extruded disc fragment was found on the left side of the spinal canal at the L4–5 level on T2-weighted MRI.

Conclusion

The case reported here is the regression of a large lumbar disc extrusion after 1 year of thermomechanical massage bed treatment. The disc regressed with clinical improvement and was documented as a follow-up MRI study 9 months later.

Introduction

Many patients with extruded lumbar disc herniation require surgical intervention but some neurological symptoms of intervertebral disc herniation may often improve with conservative treatment. Patients usually try various treatment methods ranging from alternative treatments to surgery^{1,2}. Recently, a new thermomechanical massage device has emerged, primarily in Asian countries, with considerable anecdotal evidence of health benefits³. These devices have been increasingly used for self-directed health care in Turkey, and are sold through a variety of commercial and web-based outlets. The manufacturer claims that these thermomechanical massage beds are helpful in reducing musculoskeletal pain, improving digestion, appetite and bowel function, although there is no supporting documentation³.

Although the literature contains several reports of the spontaneous regression of herniated intervertebral discs without surgical

management, the exact mechanism of spontaneous disc regression remains unknown^{4–6}. This report presents a patient who experienced a large lumbar extruded lumbar disc herniation, which regressed with thermomechanical massage bed treatment.

Case Report

A 42-year-old man with a 1-month history of lower back and left leg pain was admitted to our Department. Straight leg raising test was positive on the left side at 30 degrees and the neurological examination was normal except for left-side hypoactive reflexes. His initial leg pain had been so intense that the patient was unable to ambulate without a wheelchair. His pain was not exacerbated by coughing and moving about. Magnetic resonance imaging (MRI) of the lumbar spine had already been obtained after his admission to the neurosurgery department. A large extruded disc fragment had been found on the left side of the spinal canal at the L4–5 level on T2-weighted MRI (Figures 1a and b). Although offered

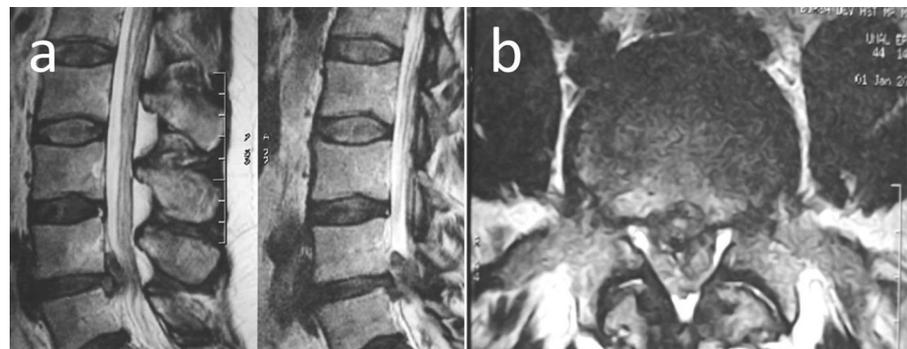


Figure 1: (a) The sagittal T2-weighted image of the initial MRI study reveals a large herniated disc at the L4–5 level with caudal migration (January 2010). (b) Axial T2-weighted image of the initial MRI shows a left side posterolateral extruded disc fragment (January 2010).

*Corresponding author

Email: drozkankose@hotmail.com

¹ Department of Physical Medicine and Rehabilitation, Bursa Military Hospital, Bursa, Turkey

² Department of Orthopedics and Traumatology, Aksaz Military Hospital, Marmaris/Mugla, Turkey

³ Department of Neurology, Bursa Military Hospital, Bursa, Turkey

⁴ Department of Orthopedics and Traumatology, Florence Nightingale Hospital, Istanbul, Turkey

⁵ Department of Orthopedics and Traumatology, Antalya Education and Research Hospital, Antalya, Turkey

Licensee OA Publishing London 2013. Creative Commons Attribution License (CC-BY)

FOR CITATION PURPOSES: Kaya E, Ozyurek S, Kaplan C, Gokcen B, Kose O. Regression of an extruded lumbar disc herniation after thermomechanical massage bed therapy. OA Orthopaedics 2013 Aug 01;1(2):15.

Competing interests: none declared. Conflict of interests: none declared. All authors contributed to the conception, design, and preparation of the manuscript, as well as read and approved the final manuscript. All authors abide by the Association for Medical Ethics (AME) ethical rules of disclosure.

operative treatment than physical and medical therapy, the patient preferred to have thermomechanical massage bed treatment voluntarily. Nine months later, the patient's complaints were resolved and normal reflexes were determined. After visiting our outpatient clinic for follow up, a second MRI of the lumbar spine was taken and total regression of the extruded disc fragment was found on T2-weighted MRI (Figures 2a and b).

Discussion

In the literature, there are several reports of the spontaneous regression or disappearance of herniated intervertebral discs without surgical management⁷⁻⁹. The spontaneous regression of intervertebral disc herniation is well documented, but the exact mechanism of this process remains unresolved. Three popular mechanisms have been reported in the literature. The first hypothesis is that the herniated disc retracts back into the intervertebral space and protrudes through the annulus fibrosus. The second hypothesis is that the disc regression is due to gradual dehydration and shrinkage of the disc. The third hypothesis is that enzymatic degradation and phagocytosis of cartilaginous tissue is due to inflammatory reaction and neovascularisation of disc herniation^{4,10}.

According to the manufacturers, the thermomechanical massage devices have been designed based on acupuncture theory originating in China more than 2500 years ago. Energy circulates throughout the body along well-defined pathways or meridians. Points on the skin along these pathways connect specific organs and body structures. Through acupuncture or acupressure along the spine, practitioners of oriental medicine hope to stimulate the energy balance of organs to restore health. The thermomechanical massage probes provide pressure and heat to the paraspinal region. This region of the body generally corresponds to the acupuncture meridians of oriental medicine, the treatment of which produces local changes and effects on the deep organs³. Using functional MRI, Hui et al.¹¹ determined that acupuncture stimulation producing pain relief also decreased activity in limbic nuclei. Developers of the device argue that the heating probes act upon the acupoints, in a similar manner to moxibustion, to influence health but there are no research studies to support these claims. Modulation of these structures may be one mechanism by which thermomechanical massage alters pain thresholds.

Warmth is associated with pain relief and relaxation. In physical therapy, locally applied heating agents are used to promote relaxation, provide pain relief, increase blood flow, facilitate tissue healing and prepare stiff joints and tight muscles for exercise¹². Studies have shown that the massage effects are most likely mediated by improving immunity and increasing the activity levels of the natural killer cells, promoting general stress relief, improving circulation, decreasing blood pressure, promoting lymph drainage and a number of favourable psychological changes^{13,14}. Awad et al.¹⁵ demonstrated that a thermal massage rehabilitation program was more successful in reducing back pain and self-experienced disability and in improving lumbar muscle endurance.

As financial barriers limit access to medical services for some patients, people have become interested in the innovative promotional strategy used to market the Korean thermomechanical devices. There are three demonstration centres in our city. Access to the centres is unlimited. Patients are allowed access to the devices at the demonstration centres free of charge, and for as long as they like, without undue pressure to purchase the device for home or office use. Patients use the devices three to four times per week. The promotion strategy has also promoted support groups for users. Around 20–40 devices are utilised by patients at one time for synchronised sessions lasting 25 minutes each. This group atmosphere is also relaxing and friendly for patients, where they can also share their health problems and outcomes with others at the demonstration centres. So this positive atmosphere may affect patients' quality of life and satisfaction.



Figure 2: (a) The second MRI study in September 2010: there was no evidence of the previous extruded disc herniation in the sagittal T2-weighted image. (b) The second MRI study in September 2010: there was no evidence of previous extruded disc herniation in the axial T2-weighted image.

Conclusion

Although there have been several cases of spontaneous regression of

Licensee OA Publishing London 2013. Creative Commons Attribution License (CC-BY)

disc herniation, thermomechanical devices might be considered to have positive effects on clinical findings and radiological changes, as seen in the case presented here. Carefully designed controlled studies will be required to evaluate the therapeutic advantage of the thermomechanical devices and whether there are any additional benefits to regular use in a relaxed social setting such as in the demonstration centres.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

References

- Ryu SJ, Kim IS. Spontaneous regression of a large lumbar disc extrusion. *J Korean Neurosurg Soc.* 2010 Sep;48(3):285-7.
- Sabuncuoglu H, Ozdogan S, Timurkaynak E. Spontaneous regression of extruded lumbar disc herniation: report of two illustrative cases and review of the literature. *Turk Neurosurg.* 2008 Oct;18(4):392-6.
- So CS, Giolli RA, Jauregui M, Schuster TL, Yang H, Blanks RH. Thermomechanical massage devices used in China and South Korea: a preliminary report of health outcomes and side effects. *J Vertebral Subluxation Res.* 2003 Sep;3:1-9.
- Autio RA, Karppinen J, Niinimäki J, Ojala R, Kurunlahti M, Haapea M, et al. Determinants of spontaneous resorption of intervertebral disc herniations. *Spine (Phila Pa 1976).* 2006 May;31(11):1247-52.
- Ushewokunze S, Abbas N, Dardis R, Killeen I. Spontaneously disappearing lumbar disc protrusion. *Br J Gen Pract.* 2008 Sep;58(554):646-7.
- Albayrak S, Durdag E, Atci IB, Ayden O. Rapid spontaneous regression of lumbar disc herniation accompanying neurological recovery: case report. *JPMR Sci.* 2012;15:89-91.
- Mirzai H, Umur AŞ, Barutcuoglu M, Tosun C, Akbaşak A. Servikal disk hernisinde spontan rezorbsiyon. *T Klin J Med Sci.* 2003 Dec;23(6):480-2. Turkish.
- Kasımcan Ö, Kaptan H. Lomber disk hernisinde spontan regresyon. *T Klin J Med Sci.* 2008 Jun;28(3):422-4. Turkish.
- Gürkanlar D, Acıduman A, Kocak H, Gunaydın A. Spontaneous regression of lumbar disc herniations at different levels and times in a patient: a case report. *Turk Neurosurg.* 2005;15(1):18-22.
- Monument MJ, Salo PT. Spontaneous regression of a lumbar disk herniation. *CMAJ.* 2011 Apr;183(7):823.
- Hui KK, Liu J, Makris N, Gollub RL, Chen AJ, Moore CI, et al. Acupuncture modulates the limbic system and subcortical gray structures of the human brain: evidence from fMRI studies in normal subjects. *Hum Brain Mapp.* 2000 Feb;9(1):13-25.
- Curkovic B, Vitulic V, Babic-Nagic D, Durriegl T. The influence of heat and cold on the pain threshold in rheumatoid arthritis. *Z Rheumatol.* 1993 Sep-Oct;52(5):289-91.
- Hernandez-Reif M, Field T, Krasnegor J, Theakston H. Low back pain is reduced and range of motion increased after massage therapy. *Int J Neurosci.* 2001 Feb;106(3-4):131-45.
- Diego MA, Hernandez-Reif M, Field T, Freidman L, Shaw K, Ironson G. Massage therapy effects on immune function in adolescents with HIV. *Int J Neurosci.* 2001 Jan;106(1-2):35-45.
- Awad MR, Hassieb ASA, Al-Gamal MS. Efficacy of thermal massage therapy in chronic low back pain. *Egypt Rheumatol Rehab.* 2003 Sep;30(5):677-87.