ASSESSMENT OF ANGULAR TRACTION IN TREATMENT OF HERNIATED LUMBAR DISC

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Abstract

This was a prospective study on the assessment of angular traction in treatment of herniated lumbar disc conducted by assessing the outcome of treatment of 15 cases of herniated lumbar disc by computerized angular traction using the DRS decompression table system

Key word:

LUMBAR _ TREATMENT_ ANGULAR

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List of Abbreviations

ALBP	Acute low back pain
ALIF	Anterior lumbar interbody fusion
CBC	Complete blood picture
CI	Confidence interval
CLBP	Chronic low back pain
CT	Computed tomography
DRG	Dorsal root ganglion
DRS	Distraction reduction stabilization
ESR	Erythrocyte sedimentation rate
FDA	Food and Drug Administration
GP	General practitioner
HNP	Herniated nucleus pulposus
IDD	Internal disk decompression
IDET	Intradiscal electrothermal therapy
IVD	Intervertebral disc
IVF	Intervertebral foramen
LBP	Low back pain
LSA	Lumbosacral angle
MRI	Magnetic resonance imaging
NSAIDs	Non-steroidal anti-inflammatory drugs
ODI	Oswestry disability index
PLIF	Posterior lumbar interbody fusion
PLL	Posterior longitudinal ligament

RCTs	Randomized controlled trials
RMDQ	Roland-morris disability questionnaire
ROM	Range-of-motion
SHA	Sacral horizontal angle
SIA	Sacral inclination angle
SLR	Straight leg raising
SPORT	Spine patient outcomes research trial
TENS	Transcutaneous electrical nerve stimulation
V.A.S	Visual analogue scale
VAX-D	Vertebral axial decompression

INTRODUCTION

Low back pain (LBP) is one of the most common medical problems. It represents a particularly costly sociomedical problem due to the expenditure associated with repeated, long term absence from work & the need for social support ***(Shen et al., 2006).***

Mechanical causes may be either injury to lumbosacral muscles and ligaments, facet joint or sacroiliac joint arthropathy, or discogenic disease due to degenerative changes. Discogenic pain most commonly affects the lower back, buttocks, and hips and is thought to be related to injury and subsequent repair of the anulus fibrosus ***(Peng et al., 2006)***.

Management of lumbar disc may be conservative or surgical. Lumbar traction is one of the conservative methods used in the treatment of lumbar disc herniation. Traction has been shown to separate the vertebrae which could provide relief from radicular symptoms by removing direct pressure or contact forces from sensitized neural tissue. It may have some benefits by stretching soft tissues, widening & opening spinal joint surfaces & or separating bone fragments ***(Atachson et al., 1996)***.

In the late 1990 s a new device for Lumbar traction was developed (Decompression, Reduction, Stabilization) which had most of advantages of the traditional traction

machine. The next generation technology utilizes internal disc decompression protocols known as IDD therapy. The machine provides static, intermittent and cycling distraction forces to relieve pressure on structures causing low back pain. The machine is used to treat bulging herniated discs, degenerated disc disease, radiculopathy, facet syndrome, spinal stenosis and spinal arthritis using accurate decompression management software coupled with an intelligent device.

AIM OF THE WORK

The aim of this study is to examine the efficacy of new method of traction using IDD therapy in the management of patients with herniated lumbar disc who had no absolute indication for surgery.

ANATOMY AND BIOMECHANICS OF THE LUMBAR SPINE

I. Anatomy of the vertebral column:

The vertebral column (spine) forms the central axis of the skeleton. The great strength of the column comes from the size and architecture of the bony elements, the vertebrae and the ligaments, muscles that hold them together. This great strength is combined with great flexibility; the column is flexible because it has so many joint so close together. Finally, the vertebral column contains in its cavity the spinal cord which it gives protection ***(Sinnatamby, 1999).***

In the fetus in utero, the column lies flexed in its whole extend like the letter "C". This anterior flexion or concavity is "the primary curvature" of the column, and it is retained throughout life in the thoracic, sacral and coccygeal parts. After birth, secondary extension of the column produces "the secondary curvatures" with an anterior convexity i.e.: lordosis in the cervical and lumbar regions, the former associated with muscular support of the head and the latter with that of the trunk, as the secondary curvatures develop in the neck and lumbar regions, the vertebral column is opened out from its original "c" shape and elongated into a vertical column characterized by gentle sinuous bends. These bends give certain resilience

to the column, nevertheless the actual shock-absorbing factors in the spinal column are the intervertebral discs ***(Sinnatamby, 1999)***.

The motion segment is the basic anatomic unit of the spine. It comprises 2 adjacent vertebrae and their intervening soft tissues. This structure, sometimes called a "functional spinal unit", is viscoelastic and absorbs energy. It is convenient to divide the motion segment into anterior and posterior elements or columns. The dividing line is just behind the vertebral body. The anterior elements include the vertebral body, the disc and the anterior, posterior longitudinal ligaments. These provide the major support for the spinal column and absorb impact. In so doing they restrict vertical translational motion. The posterior elements include the neural arch and its processes and zygapophyseal joints lay to the posterior and with the disc control patterns of motion about the other axes ***(White and Punjabi, 1991)***.

A- The Normal Disc:

The intervertebral discs lie between the vertebral bodies, linking them together **(Figure 1)**. They are the main joints of the spinal column and occupy one-third of its height. Their major role is mechanical, as they constantly transmit loads arising from body weight and muscle activity through the spinal column. They provide flexibility to this, allowing bending, flexion, and torsion ***(Raj et al., 2008)***.

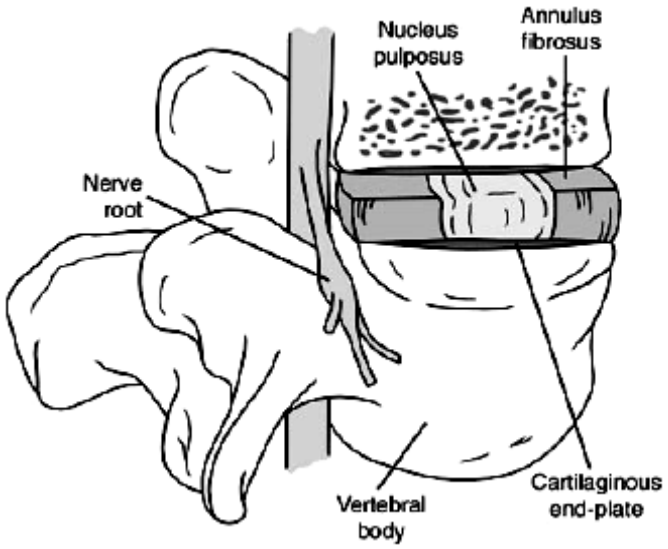

Figure 1: A line drawing of the spinal segment consisting of two vertebral bodies and a normal intervertebral disc sandwiched between them ***(Raj et al., 2008).***