Journal of Forensic and Legal Medicine 22 (2014) 159–169

Contents lists available at ScienceDirect

Journal of Forensic and Legal Medicine

journal homepage: www.elsevier.com/locate/jflm

Original communication

Lumbar disc herniation and cauda equina syndrome following spinal manipulative therapy: A review of six court decisions in Canada

Pierre Boucher, DC, PhD Professor *, Sébastien Robidoux, DC Professor

Department of Chiropractic, University of Québec at Trois-Rivières, Trois-Rivières, Québec G9A 5H7, Canada

ARTICLE INFO

Article history:
Received 18 July 2013
Received in revised form
19 December 2013
Accepted 23 December 2013
Available online 7 January 2014

Keywords:
Chiropractic
Manipulation
Disc
Herniation
Malpractice
Standard

ABSTRACT

The purpose of this review is to expand practitioners' knowledge on areas of liability when treating low back pain patients. Six cases where chiropractors in Canada were sued for allegedly causing or aggravating lumbar disc herniation after spinal manipulative therapy were retrieved using the CANLII search database. The case series involves 4 men and 2 women with an average age of 37.3 years (range, 31–48 years). Trial courts' decisions were rendered between 2000 and 2011. This study highlights the following conclusions from Canadian courts: 1) informed consent is an ongoing process that cannot be entirely delegated to office personnel; 2) when the patient's history reveals risk factors for lumbar disc herniation the chiropractor has the duty to rule out disc pathology as an etiology for the symptoms presented by the patients before beginning anything but conservative palliative treatment; 3) lumbar disc herniation may be triggered by spinal manipulative therapy on vertebral segments distant from the involved herniated disc such as the thoracic spine.

1. Introduction

The practice of chiropractic has changed significantly over the past twenty years. In particular, safety concerns and medico-legal issues of chiropractic therapy have become important topics of discussion in the medical and chiropractic literature. To our knowledge, no previous reports have analyzed the relationship between malpractice litigation and allegations of disc herniation following spinal manipulative therapy (SMT). The purpose of this paper is to analyze factors that have created litigation in this matter in order to help chiropractors better understand their liabilities when treating low back pain patients.

1.1. Low back pain

Low back pain (LBP) is a major health problem throughout the world. Experienced by 70%–80% of the adult population at some time during their lives, it is believed that adults of working age are the most vulnerable to this condition. However studies report that the prevalence of back pain decreases around the middle of the sixth decade.[1] In Canada, it is estimated that medical expenditure on LBP costs between $6 billion and $12 billion annually.[2] Although patients continue in a large measure to seek traditional medical attention, the number of patients who solicit complementary and alternative medicine (CAM) therapies has increased dramatically over the last decade.[3] The most prevalent CAM therapies for back and neck pain in the U.S. are spinal manipulation, acupuncture, and massage.[4] Of note is that almost twenty years ago, the U.S. Agency for Health Care Policy and Research guidelines on back pain recommended the use of spinal manipulation as one important treatment option for LBP.[5] Different sources report that between 9.9% and 12.5% of the Canadian population has consulted with a chiropractor at least once during a given year.[2] In a study that looked at visit rates in 6 cities in the U.S. and Canada, Hurwitz et al. found that 68% of all chiropractic patient visits were for LBP. Of those patients, 45.4% had pain that had been present for less than 3 weeks, while 21.2% had pain that had lasted for over 6 months. Two percent had previous surgery for LBP.[6]

1.2. Tissue-source of low back pain

Studies suggest that low back pain may arise from a number of anatomical structures, including bones, intervertebral discs, joints, ligaments, muscles, neural structures and blood vessels.[7] Intervertebral discs may undergo degenerative changes where mechanical, traumatic, nutritional, and genetic factors all play a role in the cascade of the degenerative process. Lumbar disc herniation

* Corresponding author. Tel.: +1 819 376 5186x3992; fax: +1 819 376 5204.
E-mail addresses: Pierre.B.Boucher@uqtr.ca (P. Boucher), Sebastien.Robidoux@uqtr.ca (S. Robidoux).

1752-928X/$ – see front matter
http://dx.doi.org/10.1016/j.jflm.2013.12.026

(LDH) may happen when degeneration, in association with a host of triggering factors, causes localized displacement of nucleus, cartilage, fragmented apophyseal bone, or fragmented annular tissue beyond the intervertebral disc space.[8] The prevalence of LDH in the general population has been estimated at 1–3%.[9] Many reports have shown the spontaneous resolution of LDH, both clinically and on CT scanning.[10] Proposed risk factors for LDH have included degenerative disc disease,[11] genetics,[12] smoking, physical loading such as lifting, driving motor vehicles, vigorous sport activities, industrial work activities[13] and higher body weight and height.[14]

1.3. Spinal manipulative therapy

Spinal manipulative therapy (SMT) is frequently practiced by chiropractors for the management of LBP and can be broadly defined as a manual procedure that involves a high-velocity low-amplitude thrust to move a joint past the physiologic range of motion, without exceeding the anatomic limit.[15] For the purpose of this article, SMT also comprises a diversity of chiropractic technique systems including, for example, mechanically assisted procedures using a moving piece of the treatment table or a percussion instrument which delivers, through a handheld device, a mechanical force to move the spinal functional unit.

Since it is uncommon for patients to have pain only in the lower back,[16] chiropractors may also use SMT on other areas of the body such as the sacroiliac and lower thoracic joints to relieve pain and improve function when treating low back pain patients.

Side posture manipulation is probably the main technique used by Canadian chiropractors to induce movement at the lumbosacral spine (Fig. 1).[17] During this procedure, the chiropractor administers a preload force to rotate the joint to the elastic barrier of the passive range of motion. Then, an impulse load is applied in such a way that the resultant displacement does not exceed the anatomic limit of the articulation. It is thought that at the beginning of the thrust, the intervertebral pressure increases because of the rotational component of the manipulation whereas at the end of the thrust, the intervertebral pressure decreases below the baseline because of the predominance of the traction component.[18] During lumbar spine manipulations, loads transmitted across the body generally remain within the range of the forces generated in common daily tasks.[19]

1.4. Risks of SMT

As with any intervention, there are risks associated with SMT. The majority of adverse events reported in the literature regarding this procedure are benign and transitory. Gouveia (2009) related that 33%–60.9% of patients submitted to spinal manipulations mostly report local discomfort and radiating pain. These symptoms appear frequently in the first hour after treatment and disappear within the first 24–48 h.[20]

Rare but serious complications associated with SMT may also occur. Estimates of the incidence of serious adverse events from published case reports and case series are about 1 event per 1 to 2 million treatments.[20] In general, a higher risk of adverse event is associated with severe spondylitic changes, osteoporosis, fractures, tumors, ankylosing spondylitis, infections or signs of nerve root pressure.[20] In the lumbar spine, safety concerns are related to the risk of manipulation triggering or worsening a herniation and/or causing acute cauda equina syndrome.[21] A Canadian Chiropractic Protective Association claims review for the period 1986–1990 showed that lumbar spine injury comprised 23% of total claims making this type of injury the most frequent cause of litigation in the Canadian chiropractic profession.[22]

Some authors suggest that forces exerted during side posture manipulation of the lumbar spine may change the vertebrae axis of rotation causing a lateral shearing force through the disc and an annular tear.[23] By contrast, others argue that because rotation in the lumbar spine is limited to only 2–3° it is unlikely that a side posture manipulation can injure a healthy disc. Authors hypothesize that the disc must already be fragmented and fissured for spinal manipulation to cause increased symptoms of disc herniation or cauda equina syndrome (see the review by Oliphant, 2004).[23]

SMT to the thoracic spine may be applied with no resultant rotatory or compressive force to the lumbar spine and theoretically does not represent a significant risk to lumbar intervertebral discs. By contrast, ischiatic contact pelvic manipulation to treat sacroiliac joint syndrome (SJD) causes flexion and compression of the lumbar spine and should be avoided in cases of intervertebral disc herniation (Fig. 2).[24]

Safety during lumbar spine manipulation is still a matter of debate in scientific circles and so far no definitive conclusion can be drawn on the level of intervertebral pressure created in humans during side posture lumbar manipulation and the risk of causing or aggravating a disc herniation.

1.5. Standard of care

Courts have established that a medical practitioner has the duty to exercise the degree of care expected of a minimally competent practitioner in the same specialty and under the same circumstances. For chiropractic in particular, the Queen's Bench of Alberta specified that the standard of care is the degree of care, diligence,

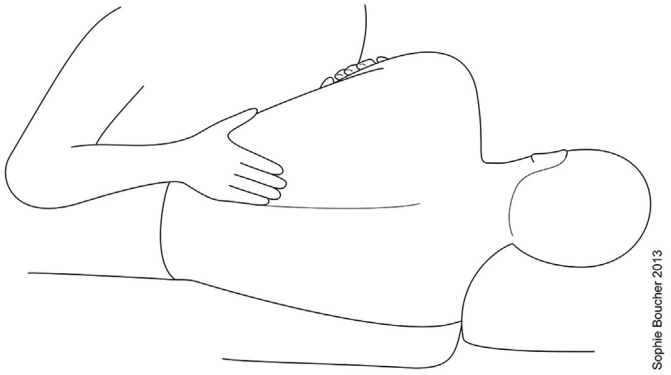

Fig. 1. Side posture lumbar spine manipulation.

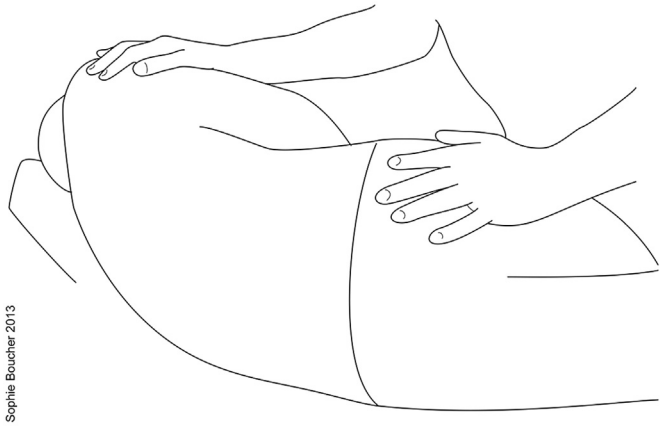

Fig. 2. Side posture ischiatic contact sacro-iliac manipulation.