Chiropractic spinal manipulative therapy for a geriatric patient with low back pain and comorbidities of cancer, compression fractures, and osteoporosis

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Abstract

Objective: The purpose of this report is to describe the response of a geriatric patient with low back pain and a history of leukemia, multiple compression fractures, osteoporosis, and degenerative joint disease using Activator chiropractic technique.

Case Report: An 83-year-old man who is the primary caretaker for his disabled wife had low back pain after lifting her into a truck. The patient had a history of leukemia, multiple compression fractures, osteoporosis, and degenerative joint disease. His Revised Oswestry Low Back Pain Disability Questionnaire was 26%, with a 10/10 pain rating at its worst on the Numeric Pain Scale. The patient presented with a left head tilt, right high shoulder, and right high ilium with anterior translation and flexion of the torso and spasm and tenderness from the lower thoracic spine to lumbar spine.

Intervention and Outcome: The patient was cared for using Activator Methods protocol. After 8 treatments, the patient was stable and remained stable for 4 months without spasm or tenderness in his spine. His Revised Oswestry score dropped to 6%, with a 4/10 Numeric Pain Scale pain rating when at its worst; and the patient reported being able to take care of his wife.

Conclusion: The findings of this case suggest that Activator-assisted spinal manipulative therapy had a positive effect on low back pain and function in an elderly patient with a complex clinical history.

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Introduction

Treatment of the elderly with alternative medicine has increased, with a recent study showing that 41% of seniors reported using a complementary alternative

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medicine (CAM) treatment and that chiropractic care comprised 20% of those treatments received. In this study, 80% of these people reported that they had received a substantial benefit from their use of CAM.¹ Another study reports that chiropractic care was the most frequent provider at 11% of the 30% of people 65 and older that used at least one alternative medicine modality in the preceding year.² Chiropractic adjustments for the elderly have been either recommended or considered to be appropriate for the elderly by the Agency for the Health Care Policy and Research and the American Geriatric Society Panel Guidelines for the Management of Chronic Pain.³

Chiropractic is considered to be “by far the largest alternative health-care profession,” and more than 30% of patients use chiropractic care for low back pain.³ One research study listed Activator Methods as one of the common chiropractic techniques being used by patients older than 55 years.³ The Activator Method of chiropractic care was developed in 1968 by cofounders Warren C Lee, DC, and Arlan W Fuhr, DC.

The Activator Method is based on a holistic view of the spine and its coordinated function. Neuroarticular dysfunction and vertebral subluxations are central to the understanding of the Activator Method. The belief that faulty biomechanical behavior of articulations is reflected in changes in leg length is used in determining treatment. Various provocative tests are performed, and leg length is evaluated to determine the presence of subluxations or neuroarticular dysfunctions.⁴ The Activator Adjusting Instrument is used to treat these subluxations using a mechanically assisted high-speed, low-amplitude adjustive thrust to specific vertebrae.⁵ This technique is also referred to as *Activator-assisted spinal manipulative therapy* (ASMT).⁶

Compression fractures, considered the most common fractures of the lumbar spine, occur when a portion of bone is forced into the adjacent segments, driving the end plates together.⁷ Vertebral fractures are very common and associated with decreased quality of life according to the *American Journal of Roentgenology*. It further states that “patients with vertebral fractures often have difficulty with activities of daily living (ADLs) such as rising from a chair, bathing, dressing, cooking, climbing stairs, and walking.”⁸ Vertebral fractures have a strong correlation to chronic low back pain, limitation of spinal mobility, reduction in pulmonary function, and social isolation.⁸ Complicating things further is the fact that, in the middle-aged and elderly population, compression fractures may arise from ordinary actions, such as lifting.⁷

The National Osteoporosis Foundation reports that 30 million American women and 14 million men are affected by osteoporosis or osteopenia and that vertebral fractures account for nearly half of all osteoporotic fractures, being twice as common as hip fractures.⁸ Osteoporosis is the most common metabolic disorder of bone, affecting approximately 100 million people worldwide.⁹ The disease affects 33% of men by age 75 years, even though osteoporosis is often focused on as a women’s health issue. The decreased bone mass or increased porosity that occurs with osteoporosis weakens the structural support of the osseous spinal column.⁹

Nearly 46% of men and 38% of women will be diagnosed with cancer in their lifetime in the United States. An astonishing 80% of all cancers are diagnosed at ages 55 years and higher. Pain in cancer patients is a problem because it is often undertreated because of concerns of adverse effects and additional pain experienced during therapy. One of 3 cancer patients suffer from pain either from the lesion or the treatment, with additional concerns arising from undesired adverse effects of medications.¹⁰

The purpose of this report is to present a case of a geriatric patient with low back pain and several comorbidities who responded well to ASMT.

Case report

An 83-year-old man with chronic leukemia; compression fractures at T12, L1, and L2; lumbar degeneration; and osteoporosis presented to a chiropractic clinic with a complaint of constant lower back pain. His low back pain started after trying to lift his elderly wife into their truck. The patient has a history of falling 4 years ago while trimming a tree when he fell 9 ft. During care for that trauma, laboratory results revealed that he had leukemia. His history also includes osteoarthritis, difficulty breathing, high blood pressure, cardiac complaints, and kidney dysfunction due to his prescription medication. His medications included medication to control blood pressure, iron supplements, and medication for leukemia treatment. The patient noted that he suffers from depression.

After the injury caused by lifting his wife, he saw a chiropractor for 17 treatments but was nonresponsive to the clinical intervention. Four to 5 weeks after his last treatment in that office, his medical physician referred him to our office for care.

The patient stated that his symptoms increased with standing, laying down, bending, and walking and decreased with sitting. The patient was the primary caretaker of his physically disabled wife including lifting her repeatedly, which has caused worsening of his symptoms. He reports having trouble with ADLs including household chores. The patient complained that his legs feel very tired and that he has lost about 10 lb over the last 3 months. The patient also stated a change in urinary function with increased frequency. His Revised Oswestry Low Back Pain Disability Questionnaire¹¹ showed a 26% of pain interference with daily living activities at his initial examination. The pain rating at the time of his initial examination was a 4/10 on a Numeric Pain Scale (NPS); but he reports a varying level of pain, with a higher level of pain of 10/10 NPS when his pain is at the worst.

At the time of his initial examination, he appeared coherent, relaxed, and alert. He was 6 ft tall and weighed 140 lb. Visual postural examination revealed a left head tilt, right high shoulder, and right high ilium with anterior translation and flexion of the torso. He appeared with a positive Minor's Sign result but a negative Adam's Sign result. On examination, the patient had spasm bilaterally from T10 to L5 and tenderness 2/4 bilaterally from T11 to L5. The lumbar range of motion was 70/60 for true lumbar flexion, 20/25 for extension, and 20/25 for right and left lateral flexion with normal measurements based on the *AMA Guide to the Evaluation of Permanent Impairment, Fifth Edition*.¹²

Results of cervical compression test, shoulder depression bilaterally, Soto Hall bilaterally, cervical distraction, Valsalva, and iliac compression were negative. Result of the Kemp test was positive on the left and right with mild low back pain leaning away from the side of pain. For neurological testing, the patient was able to smoothly and easily bring finger to finger and finger to nose with eyes open and closed. Result of the Rhomberg test was positive and unstable. Although he could perform heel walking on the left, he was only able to perform heel walking on the right with assistance. For deep tendon reflexes, the patient presented with a decreased patellar reflex with +1/+2 on the left and +0/+2 on the right.

Based on the patient's initial examination, the patient was recommended to see his medical physician, have lumbar radiographs taken before treatment, and have an internal medicine consultation. The treatment plan developed for the patient following these recommendations included Activator protocol for 1 time per week for 4 weeks followed by once every 2 weeks for 2

visits and finally once every 3 weeks for 1 visit. This clinical trial treatment plan was subject to change based on the patient's progress. The treatment goals included decreasing pain, increasing strength, and being able to help his wife by lifting her, thereby increasing function and quality of life for them both.

Five days after the initial examination, the patient saw his medical doctor and had radiographs taken, revealing a new severe compression fracture of L4 and significant worsening of the L2 compression fracture compared with radiographs the patient had about 2½ years ago (Fig 1).

Chiropractic manipulation was indicated throughout the patient's treatment as per Activator protocol at the pelvis, L5, and C7 (Table 1).⁵ The Activator 4 was used by a chiropractic physician with expert-level Activator proficiency. One thrust per contact point on setting 4 delivered between 161 and 182 N of force.¹³ The patient had a prone leg length deficiency on the left

Fig 1. Generalized osteopenic/osteoporotic change and degenerative changes are noted in the lumbar region on radiograph.

Table 1 Symptom and treatment summary

Treatment week	Date	Treatment	Symptom report	Leg length deficiency
1	Wednesday 2/25/09	Examination only		
2	Tuesday 3/3/09	No treatment; awaiting radiograph results	Low back pain with muscle spasms on the left side. Has been using Traumeel (Heel Inc., Albuquerque, NM)	1/2 in
4	Wednesday 3/18/09	Left posterior ilium	Complaints are the same	1/2 in
5	Monday 3/23/09	Left posterior ilium	Has had some change with LBP and was walking better; doing dishes increases his pain	1/4 in
6	Monday 3/30/09	Left posterior ilium, C7 on the left	LBP is a 5 or 6/10 NPS; forward flexion really bothers; sitting relaxes the LB; left side neck pain that “snaps” with motion	1/8 in
7	Monday 4/6/09	L5 on the left	LBP is a 5/10 NPS; left side of neck is a little stiff; vacuuming last time caused pain down his leg; MBP	0
8	Monday 4/13/09	C7 on the left, L5 on the left	LBP is improving (4/10 NPS); gets tired; left side of neck still snapping	0
10	Monday 4/27/09	C7 on the left, L5 on the left	Not wearing his lumbar belt as much as he used to; has been able to rake; midback was bothering sitting at church; neck snaps off and on	0
12	Monday 5/11/09	C7 on the left	Has LPB off and on at a 4-5/10 NPS; has been able to stand for 1/2-3/4 h now; neck snaps off and on	0
15	Monday 6/1/09	Right anterior superior ilium	Right side LBP this morning and stiff upper back, but both decreased with movement; has been cutting his grass on riding mower, weed wacking, and helping his wife	0
19	Monday 6/29/09	Found stable, no adjustment	Low back seems a little better; feels good until he has done too much, then he begins to get sore, but if he rests 5-8 min, then he is okay. Has been helping his wife a lot and is building a ramp and doing chopping with an axe.	0
23	Monday 7/27/09	Found stable, no adjustment	Low back feels good but gets tired but sits a few minutes and can carry on	0
31	Monday 9/21/09	Found stable, no adjustment	Low back gets tired off and on but otherwise pretty good	0
33	Monday 10/5/09	Found stable, no adjustment	LBP after being in one position too long; neck snaps and is sore off and on.	0

LBP, lower back pain; *MBP*, middle back pain.

of one half inch at his first visit following his initial examination, with legs becoming even after the third treatment. After 8 visits with adjustments being

performed, the patient was evaluated and considered to be stable, meaning no adjustments indicated for a period of 4 months currently.

At his fifth appointment, he complained of some left side neck pain that “snaps” with movement. The patient reported that, by his fifth treatment, he was able to rake; by the seventh treatment, the patient was able to cut grass using his riding lawn mower and also use a weed whacker; and by the eighth treatment, the patient was using a chopping axe to cut shrubs at their home so as to build his wife a handicap ramp. This shows an increase in patient’s function and ADLs and positive response to treatment.

At the patient’s progress examination 33 weeks after his initial examination, he reports that he is able to do whatever he wants to do including lifting groceries and his wife. He relates that he is responsible for everything at home and is able to complete everything he has to do. This is reflected in his decreased disability score on the Oswestry with a total 20% decrease of disability with a progress examination score of 6%. He reports that, after his third appointment, it was “just like day and night” and that he felt much better beginning after that third appointment. The center of his low back does get tired after being in one position for too long; but if he sits for 5 to 10 minutes, he is fine to get moving again.

The patient stated that his neck continues to bother him infrequently with snapping. The patient scored an 8% for pain interference with daily living activities in the Neck Pain Disability Questionnaire at his progress examination. His overall pain rating is a 2/10 NPS with a 1/10 NPS rating at the time of examination and 4/10 NPS when the pain is at its worst. Overall results can be seen in Table 2. The results of his Health Status Questionnaire (HSQ) were above average in the functional and well-being categories but lower than average in overall health perceptions. His medical doctor was treating him for other complaints such as bladder function, cancer, and weight loss.

At the 33-week progress examination, the patient presented with postural findings of left head tilt, right high shoulder, and right high ilium and weighed 141 lb.

Table 2 Revised Oswestry Low Back Pain Disability Questionnaire and pain on the NPS before and after a course of ASMT

	Oswestry (%)	Current pain (NPS)	Pain at the worst (NPS)
Start of treatment	26	4	10
Progress examination (33 wks after initial examination, with 8 adjustment visits being performed)	6	1	4

He had no spasm or tenderness noted in his spine at the time of examination. Lumbar spine range of motion tests indicate true lumbar flexion to be 80/60, 20/25 for extension, 18/25 for left lateral flexion, and 20/25 for right lateral flexion. Cervical spine range of motion is 40/50 for flexion, 50/60 for extension, 28/45 for left lateral flexion, 12/45 for right lateral flexion, 48/80 for left rotation, and 52/80 for right rotation.

Results of cervical compression tests were all negative. Result of the Rhomberg sign was slightly positive for instability, but he could accurately complete finger to finger and finger to nose tests with eyes open and closed. The patient could also complete both heel and toe walking without assistance. Throughout his care, he reported no adverse reactions in association with the chiropractic care provided.

Discussion

There is some controversy about the safety of using spinal manipulative therapy for the elderly and even more so for compression fractures or in patients with osteoporosis. “Osteoporosis is commonly regarded as a relative or absolute contraindication to adjustment, the application of the external force believed to be potentially responsible for vertebral collapse.”⁷ However, no definitive experimental studies have been performed to support these arguments. In conducting a formal Delphi process to determine best practices for chiropractic care in older adults, it was concluded that high-force manual techniques may be contraindicated for osteoporosis depending on the severity; but other chiropractic techniques were not ruled out.¹⁴ Practice-based studies on chiropractic and geriatrics summarize some key points including that most geriatric patients receiving chiropractic care are also receiving health promotion and prevention recommendations from their doctor of chiropractic, and patients who received chiropractic care in addition to traditional medical services had fewer hospitalizations and used fewer medications than patients receiving medical care only.³

A study conducted by Johnson¹⁵ discussed treatment of an elderly patient with a similar history to the patient presented in this case study. The patient was a 71-year-old gentleman with complaints of neck pain and a history of cancer, probable degenerative joint disease, and probable osteoporosis who responded positively to postisometric muscle relaxation with specific low-force chiropractic adjustments. Rowell et al also reported a case of an elderly patient with complaints of low back pain of 12 years; duration and 4 compression fractures.

The patient's NPS pain scores dropped 26 points after 24 weeks of flexion-distraction chiropractic treatment.¹⁶

Another similar case report included a 74-year-old woman who was the primary caretaker for her 90-year-old mother who suffered from a compression fracture after a fall. The woman had a positive response with reduction of symptoms with spinal adjustments to subluxations including the fracture site. It was not stated how the patient's function improved specifically in relation to her caretaking duties, which would have been interesting to compare to this case.²

The patient in this case reported that he suffered from depression and scored as a major depression risk on the HSQ. As stated before, vertebral fractures can result in social isolation and depression and often accompanies chronic pain, such as low back pain, for which the elderly are particularly susceptible. This isolation and depression can hamper recovery from pain and injury.¹⁷ One study showed great improvement in depression and well-being after chiropractic care of an elderly patient complaining of lower back pain.¹⁷

Using the Geriatric Depression Scale could have added to this study by determining the effects of chiropractic care on the patient's reported depression. It is interesting to note however that, at the final visit, the patient scored well above average for his age group on all the positive aspects of the HSQ except general health perceptions, with the latter being possibly explained by his current cancer diagnosis. The effects of touch cannot be discounted in the benefits of chiropractic treatment. It is possible that the benefit of touch played a role in the positive outcomes of this elderly patient with multiple medical issues and self-reported depression.

In evaluating chiropractic techniques for the geriatric population, Activator was noted to have potential advantages including a low force that may be varied, having a very specific application of force, and that no rotation and extension vectors are used. Killinger³ also reported that potential limitations include that use of an instrument may limit the "hands on" aspect and that it imparts less motion into the joints than manual techniques. However, a study done by Keller¹⁸ to measure the in vivo mechanical response of the spine during manipulation with an Activator instrument showed a 1.62 ± 1.06 -mm peak-to-peak intervertebral axial displacement; and touch is still an integrated component of ASMT.

As the primary caretaker of his disabled wife, the patient and his wife were both affected by his loss of function due to pain. One study of patients with

multiple osteoporotic compression fractures showed that they had significant decreases in trunk extension, torque, spinal motion, functional reach, mobility skills, and walking distance compared with the healthy age-matched population.⁹ The patient in this case was able to increase his functional abilities to being able to chop down shrubs and build a handicap ramp. He was thankful to regain being able to lift and take care of his invalid wife again while also being able to stay and live in their own home.

The importance of care for compression fractures is not only in reducing pain but also in restoring normal function to the patient because of their association with further occurrences. The incidence of a further fracture increases to 70% 10 years after the initial moderate to severe compression fracture.⁷ Vertebral compression fractures in the elderly often occur at T6-T8, T8, T12, L1, and L4,² which was mostly true in this case, with his fractures occurring at T12, L1 and L2. Sandoz hypothesizes that an analgesic effect and decreased muscular spasm can occur from spinal adjustments in patients with compression fractures.¹⁹

Chiropractors are in a unique position to positively affect the health of the elderly. The chiropractor not only addresses the immediate complaints but promotes long-term health and wellness with respect to the traditional emphasis on a holistic practice.² In a study to determine the role of chiropractors in the diagnosis, prevention, and treatment of osteoporosis, the authors determined that "the chiropractor may be positioned to assume an increased role".²⁰

In addition, the potential cost savings of the elderly using chiropractic services is of interest. The median annual cost of assisted living is \$55 500 for a single occupancy or \$49 055 if with a home health aide in the state in which the patient resides. Median nursing home costs per year total \$102 748 for single occupancy in a private room and \$94 900 in a semiprivate room in the state in which the patient lives.²¹ The total charges in this case were only \$555.18, and both the patient and his wife were able to avoid costs of assisted care or a nursing home. One study reported that patients older than 65 years with multiple health issues reported making half the annual number of visits to medical providers compared with national average for that age group when using chiropractic services.²

There are many different opinions on the types of chiropractic manipulation (adjustments) that are appropriate for this age group. Some suggest that contacts should be broader with multiple thrusts and sustained pressure and are considered to be preferable

to high-velocity thrust adjustments.²² Yet another technique, the Gonstead method, used segmentally specific, high-velocity manipulation and was used at a clinic in the 1990s where most of the patients were older than 65 years.² Alcantara and et al² report that they disagree with all of these approaches. Activator Methods suggest only one thrust per segment.⁵

Looking at population demographics and the increased use of CAM, it is important to investigate the use of chiropractic by the elderly.³ The prospective growing health care costs for the baby boomer generation who reaches the age of 65 years in 2011 is a large national issue. It is also of special interest to investigate the use of chiropractic care in patients with compression fractures and osteoporosis because of the delicate nature of the injuries and the role of ASMT in treatment of these special concerns in this population. More research on the role of chiropractic in restoring functional capacities and quality of life in the elderly would be beneficial. This case study demonstrates good outcomes for pain relief, increased quality of life, increased ADLs, and monetary savings, allowing a family to stay in their home instead of having to enter an institutional facility.

Limitations

The limitations of this study include that the results of one case should not be generalized to a larger population and that the complete management of the patient was in an uncontrolled environment. One possible explanation for improvement in the patient's condition could be spontaneous improvement, but this appears unlikely because of the extent of his injuries and the fact that he had been unsuccessfully treated for some time before ASMT. Factors such as improvement in mental health with personalized care and the possible benefits of touch could have also played a role in his recovery. Considering the limited amount of research on the elderly and chiropractic care, we feel that this case report is of interest. The exploration of increased utilization of chiropractic care in the geriatric population could potentially improve function and quality of life and be cost-effective.

Conclusion

In this case, a geriatric patient received positive outcomes of pain relief and increased function with ASMT despite his comorbidities of cancer, compression fractures, and osteoporosis.

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