Changes in Cobb angle in a surgically-fused scoliotic spine after chiropractic treatment: a case study

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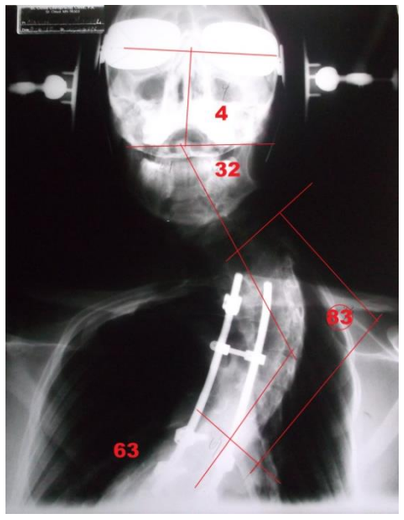
Introduction

Idiopathic scoliosis (IS) is a three-dimensional spinal deformity characterized by lateral deviation.[1] The severity of scoliosis is typically measured using Cobb angle.[2] If the Cobb angle progresses to around 45 degrees, surgical fusion and instrumentation is recommended to halt progression.[3] It is possible for the Cobb angle to continue to increase after spinal fusion.[4] Mechanisms behind postsurgical progression include the 'crankshaft effect', pseudoarthrosis, implant failure (loosening/ breakage), biological plasticity, choosing wrong vertebral levels, excessive apical translation causing decompensation by unfused segments, progressive etiology, and inadequate anchorage provided by some older instrumentation systems.[5]

This article presents a case of progressive scoliosis that was reduced through surgical fusion to 50 degrees and 9 years later had progressed to 76 degrees. Scoliosis-specific chiropractic care was provided for ten visits over one week; afterwards, the Cobb angle in the fused area of the spine measured 45 degrees, similar to the initial post-surgical correction. This is the first case report detailing the reduction of Cobb angle in a fused spine after chiropractic care to be presented in the literature.

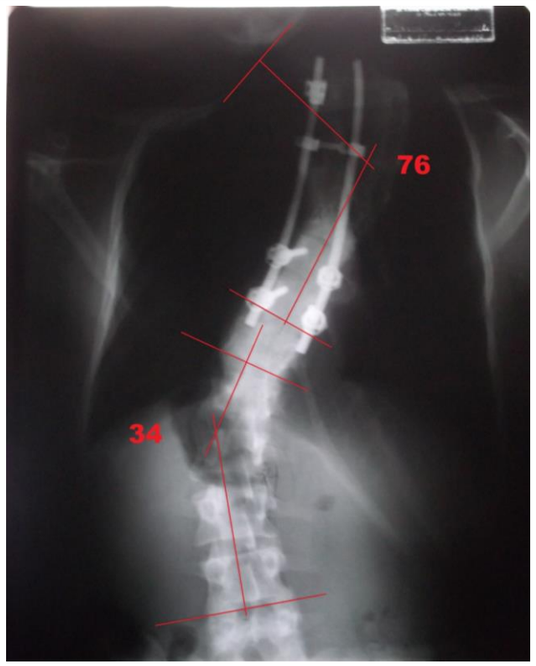
Case Presentation

The patient was initially diagnosed with idiopathic thoracic dextroscoliosis in 1998 at the age of ten by an orthopedic surgeon; at the time of diagnosis, the Cobb angle was measured to be 45 degrees. A cervical fusion without instrumentation was performed two years later in 2000; solid bony fusion of C2 through C7 was achieved. A second surgery was performed in 2002, fusing T2 through T11 with two titanium rods. Post-surgery, the thoracic Cobb angle measured 50 degrees. There was no evidence of pseudoarthrosis and the surgery was considered a success.
The patient traveled out-of-state to receive care at a private chiropractic clinic in 2013. Radiographs were taken and the Cobb angle was documented to be 76 degrees. The patient self-selected chiropractic care for symptomatic relief; at the time, his physical complaints included difficulty breathing, asthma, neck stiffness and pain, middle back pain, right shoulder stiffness and pain, balance problems, numbness in the hands and fingers, dizziness, memory problems, depression, confusion, difficulty sleeping, fatigue, headaches, heartburn, and stomach pain.

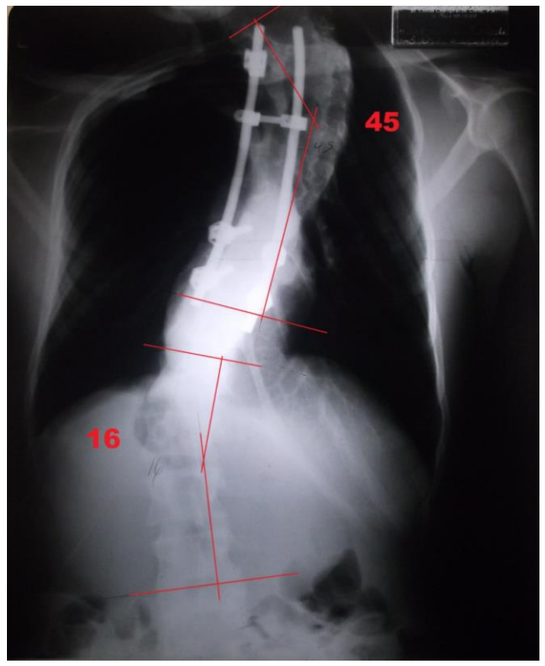


Methods and Results

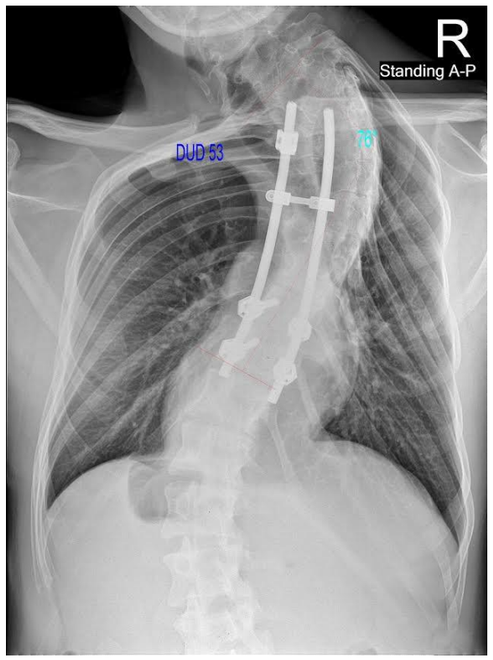
A chiropractic scoliosis-specific treatment protocol involving active mobility and spinal traction exercises, massage therapy, passive spinal distraction, spinal manipulation therapy (SMT), whole-body vibration (WBV) therapy, and sensorimotor re-integration strategies was applied twice daily over a period of one week, for a total of ten treatment sessions. No adverse events occurred as a result of care. The patient was re-examined at the conclusion of care and a follow-up scoliosis radiograph was obtained. This radiograph demonstrated the thoracic Cobb angle to be 45 degrees. The patient expressed satisfaction with the results of treatment and also reported subjective improvement of symptoms and function. The patient returned home and was contacted for follow-up at six months and one-year post-care. The six month radiograph demonstrated the thoracic Cobb angle had returned to 81 degrees, and was measured at 76 degrees after one year. The patient reported continued satisfaction with the results of treatment and maintenance of the improvement in symptomatic complaints at both follow-up intervals.



Pre-Treatment Radiograph



After one week of care



At one-year follow-up

Conclusion

This is the first paper to document reduction in a fused scoliotic spine after chiropractic care. The treating doctor hypothesized that imbalances in sagittal and coronal alignment in unfused areas of the spine contributed to biomechanical forces leading to progression of the fused region, and that reducing these imbalances through SMT and rehab was able to return the spine to its pre-stressed, post-operative state. Although the protocol appeared to be initially effective, the spine returned to its original position after six months. It is unknown if the results could have been maintained, nor what treatment regimen may have been necessary to achieve this goal; this question could be the target of future research inquiries.

The potential for chiropractic and orthopedic cooperation and co-management in cases of AIS has been documented in the literature.[6] The incidence of revision surgery for AIS ranges from 4 to 13 percent.[7,8] It may be worth the effort of further research to explore whether chiropractic care may be beneficial in reducing the need for revision surgery in some IS cases.

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