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Journal of Physiotherapy Research

ISSN 3068-4994

Case report

LiDAR Measured Curve Reduction in Adult Scoliosis: A Case Report.

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Abstract

Background: Adult scoliosis is associated with pain, disability, and reduced quality of life. Conservative management strategies such as physiotherapeutic scoliosis-specific exercises (PSSE), manual therapy, and traction are often explored, but evidence for their use remains limited.

Case Presentation: A 22-year-old female with mild structural scoliosis presented with pain, postural imbalance, and functional limitations. Baseline assessment included plain radiographs (X-Ray: thoracic Cobb: 21.7°; lumbar Cobb: 12.5°) and 3D LiDAR surface topography (LiDAR: thoracic Cobb: 24.2°; lumbar Cobb: 10.7°).

Intervention: A 16-week multimodal programme combining manual therapy, CBP-based traction, and Schroth-based PSSE was implemented, with weekly clinic sessions and a daily home-based programme.

Results: A follow-up LiDAR scan taken at end of Week 16 demonstrated apparent reductions thoracic Cobb angle (24.2° to 1.9°) and lumbar Cobb angle (10.7° to 1.3°), with improvements in sagittal and coronal balance, and shoulder obliquity. The patient reported reduced pain, improved confidence and increased functional capacity.

Conclusion: In this case, multimodal conservative care was associated with apparent curve reduction and postural improvement. Given the reliance on 3D LiDAR scans for follow-up measurements rather than radiographic confirmation, findings should be interpreted with caution.

Keywords: Case report, adult scoliosis, physiotherapeutic scoliosis-specific exercise, PSSE, manual therapy, traction, CBP, LiDAR.

INTRODUCTION

Adult scoliosis is generally accepted to be associated with a decreased quality of life and an increased incidence of lower back pain (LBP), disability and poor health related quality of life (HRQoL)[1], increasing as curve severity increases. Lumbar and thoracolumbar curves are typically reported as being more painful than thoracic only curves, especially where significant rotation is also present[2]. Unlike chronic non-specific lower back pain in the general adult population[3], scoliosis related back pain is frequently reported as being asymmetrical, localised to specific areas around the curve apexes, and may include cruralgia (femoral nerve pain) rather than sciatica[4]. A 2024 cross-sectional study identified key predictors of pain intensity in non-surgically treated adults with idiopathic scoliosis, these are: curve severity; spinal mobility; angle of trunk rotation (ATR); perception of cosmetic deformity; disability; and quality of life[5]. The authors recommend that these factors be taken into consideration when designing rehabilitation and treatment programmes.

Whilst bracing is often the gold-standard approach in adolescent populations, it's role in adult scoliosis remains inconclusive due to limited evidence of long-term therapeutic benefit. Where pain is minimal and curve severity only mild to moderate, the 2016 SOSORT guidelines recommend physiotherapeutic scoliosis-specific exercise (PSSE) be used to treat scoliosis[6]. There are a number of methodologies for PSSE, but all involve active 3D self-correction and training to incorporate curve-specific corrective positions into activities of daily life (ADLs). However, there is currently no universally accepted protocol for treating adult scoliosis, and outcomes vary widely depending on curve type, symptom severity and the patients functional capacity and engagement. The majority of studies do show that PSSE can reduce pain, disability, curve severity and improve HRQoL in some adults[7], however, the research to date is fraught with bias and poorly designed studies, largely due to the nature of research in this area often involving very small cohorts and retrospective study designs.

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Received: 11-June-2026, Manuscript No. JOPTR - 5920 **; Editor Assigned:** 12-June-2026 **; Reviewed:** 25-June-2026, QC No. JOPTR - 5920 **;**
Published: 03-July-2026.**DOI:** 10.52338/joptr.2026.5920.
Citation: Dr. Potts,MABJ. LiDAR Measured Curve Reduction in Adult Scoliosis: A Case Report. Journal of Physiotherapy Research. 2026 July; 18(1). doi: 10.52338/joptr.2026.5920.

Curve Imaging and Monitoring

Caution and careful monitoring of the curve should always be advised when treating scoliosis, though less-so in adults as the risk of curve progression is lower (though not non-existent). Age and lifestyle-related degeneration have been shown to worsen curve severity over time[8], typically at approximately 1-3° per year, though curves over 30° at skeletal maturity may progress faster. Even modest progression (e.g. 3-5° degrees over 10 years) can lead to increased pain and disability, reduced spinal mobility and compromised HRQoL[9].

In adolescent idiopathic scoliosis (AIS), patients frequently undergo x-ray imaging from diagnosis and throughout growth to monitor progress, and it is generally accepted that the exposure to ionising radiation is justified in order to prevent rapid progression that can occur during growth spurts, and to ensure that treatment modalities (such as corrective bracing) are having the desired effect[10]. In the adult-scoliosis population, repeat x-rays are generally not needed due to the slower rate of progression and the concern over unnecessary radiation exposure, though ultra low dose imaging technologies, such as EOS® Imaging, offer a potential way to dramatically reduce the per-image dose, perhaps allowing for more frequent x-rays to be taken[11]. There is, however, the issue of cost and accessibility, whilst no official figures exist, x-ray machinery typically has substantial equipment costs running into the tens of thousands, high maintenance costs, and comes with a considerable regulatory burden, which makes it unrealistic for the majority of clinics to own and operate one. This means that patients are typically referred to NHS hospital imaging departments,

which currently are facing significant backlogs, or private diagnostic centres which then push the cost onto the patient. This presents a problem for clinicians wanting to closely monitor this population, as there are currently very few non-invasive ways of accurately and reliably measuring the spine without radiation exposure, though new technological breakthroughs are promising to solve this problem. One such technology showing high degrees of accuracy and cost-effective ease of use is the use of light detection and ranging (LiDAR)[12]. LiDAR is an entirely non-invasive sensing method that measures distances using laser light to create detailed 3D surface-topography "maps". To date this has mostly been used in vegetation analysis and archaeological surveying, but there is emerging and evolving research for it's use in mapping and monitoring spinal deformities, though only after an x-ray, MRI or CT has enabled correct diagnosis and the ruling out of severe underlying pathologies. LiDAR units are more cost-effective than x-ray, they require less set-up and maintenance, do not require any shielding and have no regulatory burden as it is a non-ionising assessment.

The purpose of this report, then, is to present a case of multimodal scoliosis management, demonstrating curve reduction and postural improvement using combined conservative treatment modalities and 3D monitoring using a LiDAR system.

PATIENT PRESENTATION

History

A 22-year-old female, final-year student presented with a persistent previously diagnosed structural curvature of the spine with marked unilateral paraspinal hypertonicity, postural imbalance and activity-dependant symptoms of sharp intermittent interscapular pain, muscular pain likened to the feeling of delayed onset muscle soreness (DOMS) and fear-avoidant beliefs around posture and currently painful movements. The patients symptoms caused her functional limitations in avoiding weighted strength training, needing week-long recovery periods after flare-ups and significant psychological distress and cognitive load related to the visible asymmetry, the perceived causes and effects of scoliosis, and her concern over the impact her scoliosis may have on her future career and lifestyle plans.

Background

The patients scoliosis was first noticed after a significant right forearm fracture which had to be surgically pinned and placed in a cast at 10-years-old, the postural asymmetry was noticed following this but was not formerly diagnosed until she had finished growing at 17-years-old. The patient incorrectly believed that a combination of the heavy cast and sitting mainly on one leg throughout her childhood had caused her scoliosis, but she did also note that her grandmother and mother both also had scoliosis. The patients current lifestyle involved a lot of sitting and studying, and she was concerned about worsening her scoliosis and symptoms with an imminent transition to a practical placement year that would involve prolonged periods of standing and manual handling. Outside of her studies the patient was highly physically active doing callisthenics training, cycling, climbing, running and water-sports.

Prior Treatment

The patient reported having seen physiotherapists for help with her scoliosis and for specific exercises, but that any exercises provided to her had been so far ineffective and non-specific. Due to this, she took it upon herself to create a self-directed scoliosis-specific exercise programme which consisted of a daily morning routine that she had kept up for the past 4-years, and featured exercises focused on strengthening her posterior chain muscles, stretching and strengthening the muscles on the self-perceived "weak" side of her curves and various movements aimed at improving motor control and posture. She found that this programme had resolved the majority of her pain and had somewhat improved her asymmetry, though it provided very limited carry-over into her activities of daily life (ADLs) and her sport and exercise routines, finding that she could not relieve the perception that the muscles on the concave side of her curves were stronger and more dominant.

Treatment Goals

The patients main goal was to reduce the spinal curvatures if possible, and to correct her muscle imbalances. She wished to regain symmetry in her posture and the ability to perform all of her ADLs and recreational activities without worsening her posture and symptoms. Her secondary goal was to improve her symptoms enough so that her upcoming practical placement year would not set her back and cause complications or loss of function, as this would be detrimental to her university degree and future career plans.

Initial Objective Findings

The initial assessment was conducted on 27th January 2025, where we confirmed a thoracic-primary structural scoliosis, with a moderate compensatory lumbar curvature and associated postural imbalances. A standing subjective postural assessment revealed an obvious asymmetry with her left shoulder sitting lower than her right (the patient is right handed), a right thoracic translation, a slight left torso tilt and a right thoracic rotation. An Adam's Forward Bend test[13] was performed which revealed a 5-degree angle of trunk rotation (ATR), to the left in the mid-thoracic spine, with compensatory rotation in the upper-thoracic and lumbar spines also at 5-degrees ATR (measured using a scoliometer). Assessment in seated and prone positions showed a similar asymmetry (4-degrees) as seen in standing and bending, suggesting a structural curve rather than a functional scoliosis.

Standing low-dose radiographs showed a thoracic Cobb angle of 21.7° and a lumbar Cobb angle of 12.5°, with a coronal imbalance of 20mm, a lumbar hyperlordosis of 58.5°, a thoracic kyphosis of 49.5°, and a pelvic imbalance of 15mm with some compensatory rotation (**Figures 1 & 2**). 3D LiDAR surface topography (**Figures 3 – 5**), taken using a Spine3D LiDAR device from Sensor Medica (Italy), corroborated the radiographic findings within an acceptable margin of error, showing a thoracic Cobb angle of 24.2°, a lumbar Cobb angle of 10.7°, a lumbar hyperlordosis of 53.7°, a thoracic hyperkyphosis of 51.2°, a coronal imbalance of 13mm and a shoulder obliquity of 12mm (right higher than left). The 3D LiDAR scan was taken alongside the initial x-rays for ongoing curve monitoring without further need for ionising radiation from x-rays.

The assessment and x-rays confirmed the diagnosis of scoliosis[14] and showed that the thoracic curve had progressed since the initial x-rays taken when the patient was 17-years-old (previous: thoracic Cobb = 18°, lumbar Cobb = 15.5°). As the curvature had demonstrated some progression despite the patients best efforts with corrective exercise, and the outward appearance improving, the decision was made to begin a new treatment and exercise plan aimed primarily at stabilising the curves, along with hands-on treatment to begin to address the imbalances and pain the patient was concerned with.

Figure 1. Standing PA Stitched Full Spine X-Ray - 02/2025.

Figure 2. Standing Lateral Stitched Full Spine X-Ray 02/2025.

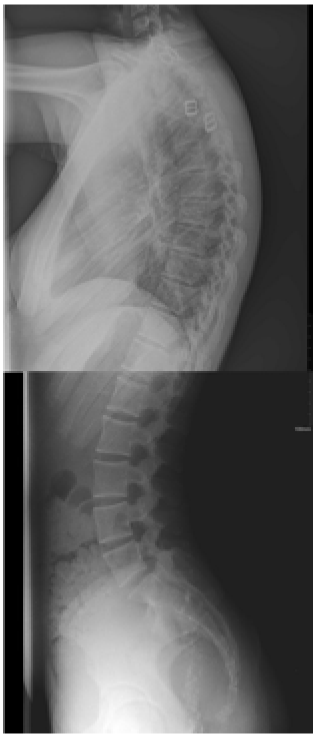


Figure 3. Sagittal measurements obtained from initial 3D LiDAR scan.

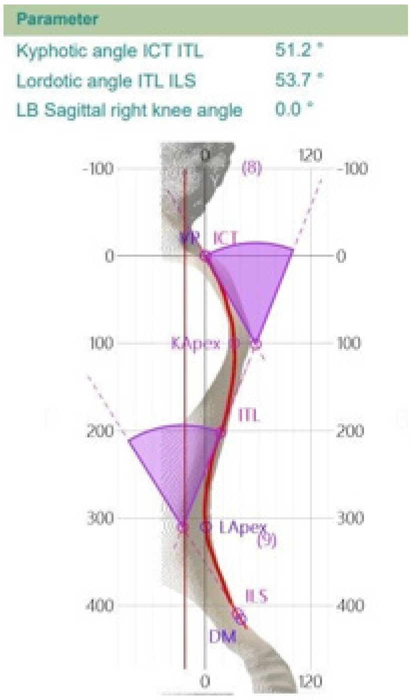
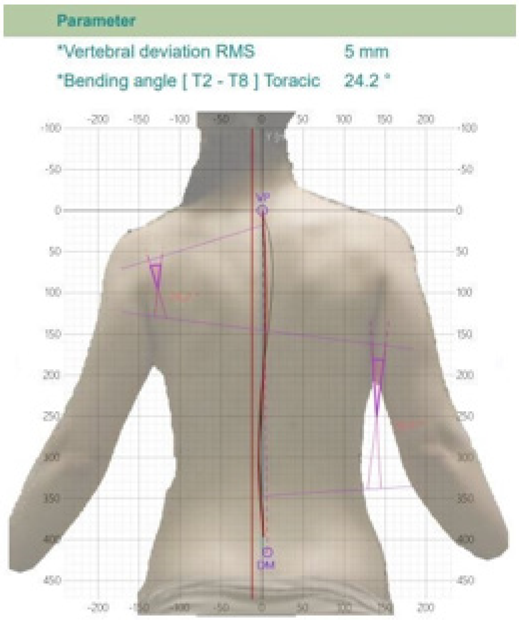


Figure 4. Standing 3D LiDAR Topographical Scan.

Figure 5. Standing 3D LiDAR Topographical Scan with Cobb angles.



Intervention

A 16-week conservative treatment programme was initiated with the primary aim of stabilising and reducing the spinal curvatures, and the secondary aim of improving postural symmetry, muscular balance and symptom burden (**Figure 6**). The plan was collaboratively designed with the patient to complement her existing exercise routine, whilst introducing some more evidence-based, targeted modalities.

Manual Therapy

Manual therapy was selected as a modality with the aim of reducing paraspinal hypertonicity, segmental stiffness, and sensorimotor dysregulation commonly observed in adult scoliosis[17-19]. Contemporary theoretical evidence suggests that manual interventions can modulate afferent input, reduce threat perception, and enhance proprioceptive signalling via neurophysiological pathways20. Weekly sessions were included which utilised soft-tissue massage (STM) and spinal manipulative therapy (SMT) focused primarily on the lower thoracic and upper lumbar spine (the thoracolumbar region), with additional attention to the cervicothoracic and interscapular regions. The patient reported immediate subjective relief, particularly in the interscapular region, following sessions, and noted improved ease of movement and reduced DOMS-like symptoms during her daily activities.

Chiropractic Biophysics (CBP) Traction

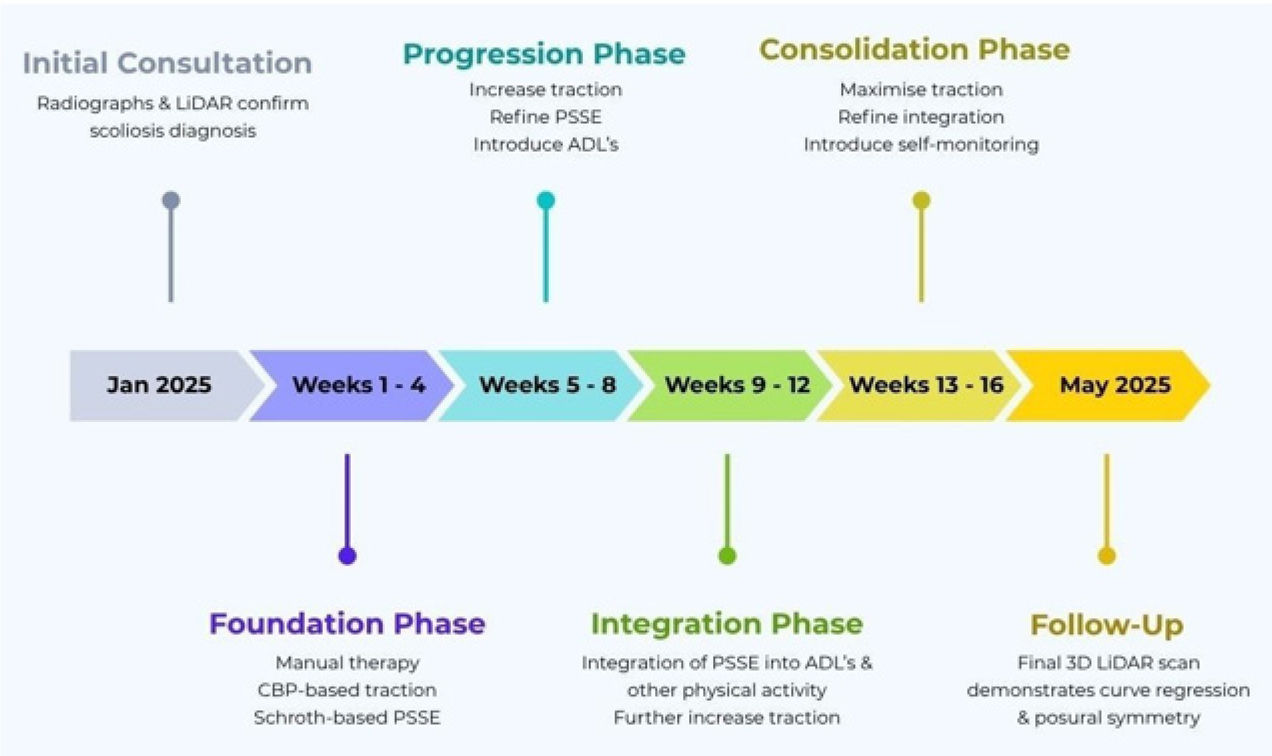
Thoracic lateral flexion traction, based on CBP® methods[21-22], was employed to target the structural asymmetry through sustained, directional loading of the spinal ligaments. This method is thought to induce viscoelastic deformation and remodelling via mechanotransductive effects[23-24], though direct clinical evidence remains limited. It was introduced early on using a ScoliRoll® wedge positioned at the convex side of the apex of the thoracic curve, to oppose the left concavity. The patient progressed from 2-6-minutes in clinic, up to 20-minutes daily at home, reporting a sense of release and improved postural awareness following sessions.

Physiotherapeutic Scoliosis-Specific Exercises (PSSE)

A high-frequency PSSE programme, grounded in Schroth and ScoliBalance® principles[26], was selected for its well-studied associations with improved postural awareness and control, reduced Cobb angles and enhanced quality of life in scoliosis patients[7]. The programme, designed with the patients curve type and functional capacity in mind, emphasised rotational breathing, spinal elongation, and active 3D postural self-correction in a variety of seated and standing positions, and later during other physical activities[7]. Mirror feedback, proprioceptive cueing, and encouragement to adopt the self-corrective postures as often as possible throughout the day, were used to reinforce motor learning and reduce fear-avoidance behaviours, consistent with established principles in other PSSE protocols7. The patient demonstrated high programme adherence and reported improved confidence with her posture and movement within the first month.

Throughout the intervention period, the patient was encouraged to maintain her usual physical activity levels, including callisthenics and climbing, with modifications to help avoid aggravating positions. She was also encouraged to integrate postural corrections and breathing techniques into her sport and ADLs[7], and to monitor her symptoms and recovery times. Progress was tracked using 3D LiDAR surface topography at baseline, 4-weekly intervals, and finally post-intervention, with clinical reassessment interviews at 8 and 16 weeks (**Figure 6**).

Figure 6. Visual Timeline of The 16-Week Treatment Protocol.



RESULTS

At the conclusion of the 16-week intervention programme, the patient underwent a follow-up 3D LiDAR surface topography scan on 31st May 2025. To ensure consistency and minimize bias, both the initial and follow-up 3D LiDAR topographical scans were performed under matched conditions (at similar times of day, with no prior treatment or exercise), and the patient was instructed to stand in her habitual posture without correction or coaching[12].

The results appeared to demonstrate substantial improvements in spinal curvature and postural asymmetry. These objective changes were mirrored by the patient's subjective experience of reduced pain, improved movement confidence and functional capacity, and a marked decrease in psychological distress related to her scoliosis.

As shown in **Table 1**, below, the thoracic Cobb angle, as measured with the Spine3D LiDAR system, reduced from 24.2° (X-Ray = 21.7°) to 1.9°, and the lumbar Cobb angle from 10.7° (X-Ray= 12.5°) to 1.3°, indicating an apparent reduction of both primary and compensatory curves (**Figure 7**). Thoracic kyphosis measured at 47.2°, and lumbar lordosis at 36°, demonstrating a potential reduction in the initial hyperlordosis and moving towards a normalisation of sagittal alignment (**Figure 8**), though mild deviations persist, indicating room for continued structural adaptation[27]. Shoulder obliquity changed from 18 mm (right higher) to 6 mm, and coronal imbalance reduced to 6 mm, reflecting reduced postural asymmetry (**Figure 9**). It is worth noting here, though, that LiDAR is operating within a 5° margin of error.

Figure 7. End of Programme Standing 3D LiDAR Scan showing Cobb angle reduction.

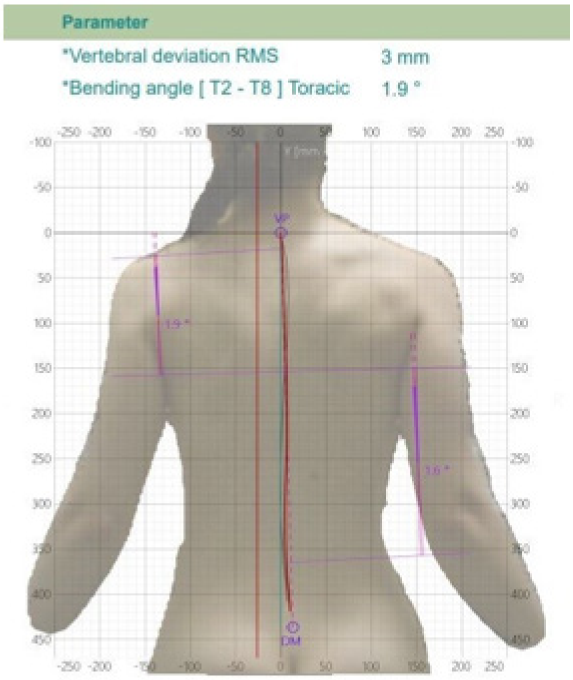


Figure 8. Sagittal Measurements taken from End of Programme 3D LiDAR Scan showing curve reductions.

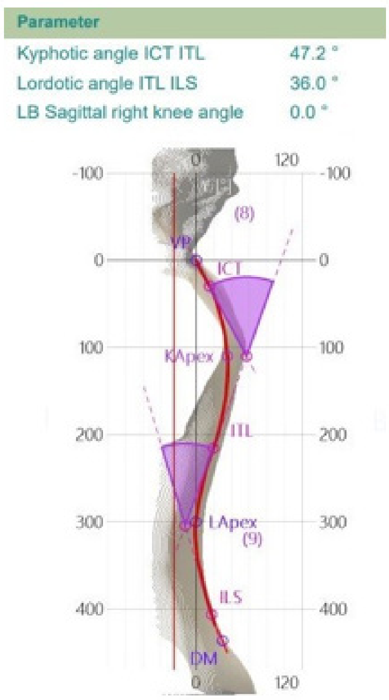


Figure 9. 3D LiDAR Comparison between Initial (left) & End of Programme (right) showing reductions in shoulder & pelvic obliquity.

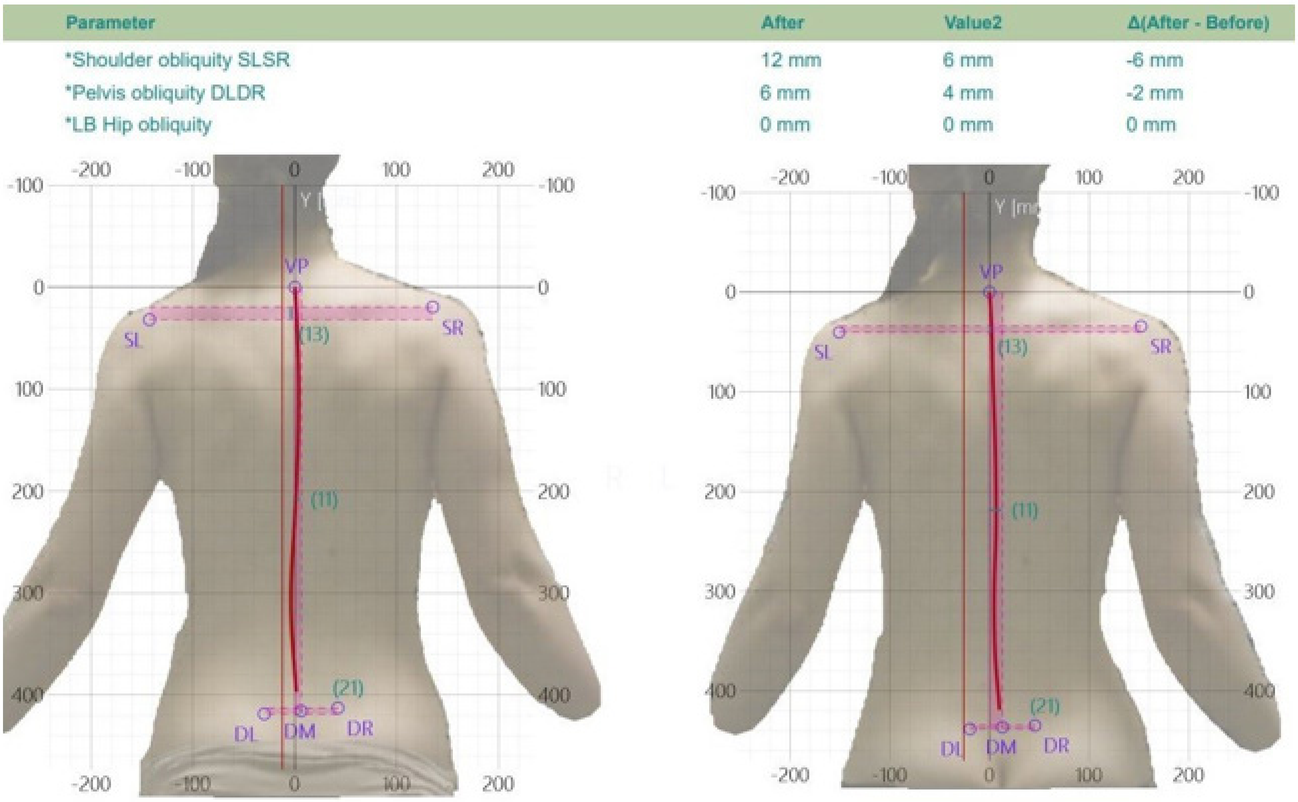


Table 1. 3D LiDAR surface topography measurements.

Metric	Initial (27/01/25)	Post (31/05/25)	Change
Thoracic Cobb Angle	24.2°	1.9°	↓ 22.3°
Lumbar Cobb Angle	10.7°	1.6°	↓ 9.1°
Thoracic Kyphosis	51.2°	47.2°	↓ 4.0°
Lumbar Lordosis	53.7°	36.0°	↓ 17.7°
Coronal Imbalance	13 mm	6 mm	↓ 7 mm
Shoulder Obliquity	18 mm (R > L)	6 mm	↓ 12 mm
Angle of Trunk	3.9°/5.7°	1.4°/3.9°	↓ 2.5°/1.8°
Rotation (ATR)	(thoracic/lumbar)	(thoracic/lumbar)	(thoracic/lumbar)

Patient reported outcome measures included qualitative self-reports of a reduction in interscapular pain and DOMS-like symptoms after exercise, with improved recovery times following her usual physical activity (no longer needing a week to recuperate as before treatment began). She reported feeling a renewed confidence in her posture and movement, noting that she no longer felt the need to "hide" her asymmetry, her fear-avoidant beliefs around movement had reduced, and she expressed optimism about her upcoming placement year, feeling more physically and psychologically prepared for the demands of prolonged standing and manual handling.

DISCUSSION

This case suggests that a 16-week, multimodal conservative care programme may be associated with apparent curve reduction and postural improvements in an adult with mild scoliosis. The sustained reduction in thoracic and lumbar Cobb angles, measured using the Spine3D LiDAR device which has known measurement error margins, may suggest neuromuscular adaptations in the paraspinal musculature along with potential viscoelastic changes in spinal ligamentous tissues23-25. Clinically significant improvements in sagittal profile, specifically the move towards normalisation of thoracic kyphosis and lumbar lordosis, were accompanied by self-reported improvements in proprioceptive awareness (body position sense improved), movement confidence, and symptom relief. These outcomes challenge the prevailing assumption that adult scoliosis is inherently resistant to non-surgical correction8,9 and highlight the potential for dynamic structural and neuromuscular remodelling beyond skeletal maturity.

The use of manual therapy likely contributed to some of these improved outcomes through neurophysiological rather than structural changes. Recent systematic reviews suggest that soft tissue techniques and spinal manipulation may modulate afferent input and enhance descending pain inhibition via changes in proprioceptive and interoceptive signalling. These effects may improve sensorimotor integration by altering cortical representation, particularly in populations with a chronic postural asymmetry. In this case, the manual therapy techniques may have served as a neurosensory primer through similar mechanisms, reducing protective muscle tone and increasing the efficacy of subsequent interventions, though causality cannot be inferred. These effects were likely amplified by contextual factors such as therapeutic alliance and the patient's prior positive experiences with hands-on care.

Chiropractic BioPhysics (CBP) traction applies sustained, directional forces to the spine in an effort to induce viscoelastic deformation in the ligamentous and intervertebral tissues. Theoretical research has shown that this form of traction may promote adaptive remodelling through prolonged tissue creep[21,23-25], though it should be noted that direct clinical trials on this phenomenon are limited. In this case, thoracic lateral flexion traction, using a ScoliRoll wedge placed on the convex side of the curve, potentially created a prolonged stretch on the inter-transverse ligaments on the concave side, and a deformation of the ligaments on the convex side, facilitating structural realignment. The patient's immediate sense of release and improved postural awareness suggests enhanced proprioceptive feedback, potentially due to alterations to the normal resting length and spindle sensitivity of deep paraspinal muscles such as intertransversarii and rotatores[17,18]. This may demonstrate that beyond its mechanical influence, CBP-based traction may also serve as a proprioceptive stimulus that challenges habitual postural set-points.

While PSSE alone has demonstrated efficacy in improving postural control and enhancing quality of life in scoliosis patients[6,7,15,26], its integration with complementary modalities has been shown to amplify these benefits[15,26]. In this case, PSSE was combined with manual therapy and CBP-based traction, each targeting distinct but interrelated domains. Manual therapy was utilised to prime the neuromuscular system by reducing paraspinal hypertonicity and enhancing proprioceptive input, creating a more receptive environment for motor learning. The CBP-based traction, in turn, then provided a sustained mechanical force to challenge the structural asymmetries and promote viscoelastic adaptation[21,22,23-25]. The Schroth-based PSSE functioned as the integrative bridge between passive structural correction and active postural embodiment, ensuring that curve reduction translated into sustainable, real-world improvements in movement and function[7,15].

This sequential combination of modalities aligns with emerging models of multimodal rehabilitation, which emphasize the importance of addressing both passive tissue properties and active motor control[20,26]. Studies suggest that combining PSSE with manual or mechanical interventions may improve adherence, accelerate neuromuscular adaptation, and enhance long-term retention of postural corrections[7,15,26]. In this case, the patient's high engagement and rapid functional gains support the hypothesis that multimodal interventions may outperform isolated modalities, particularly in adult populations where structural plasticity is limited and perceptual-motor patterns are deeply ingrained[8,9].

The use of 3D LiDAR surface topography provided a non-ionizing, repeatable, and clinically relevant method for monitoring scoliosis progression and postural adaptation. The 3D LiDAR device captured key metrics including Cobb angles, kyphosis, lordosis, coronal imbalance, and shoulder obliquity with high fidelity and strong concordance to standing radiographs. This alignment validates LiDAR's role as a screening tool and as a viable alternative for longitudinal monitoring in adult scoliosis care. Unlike traditional radiography, LiDAR scanning offers a safe and scalable solution which enables clinicians to track subtle postural shifts, muscular asymmetries, and curve dynamics in real-time, making it particularly valuable in conservative management protocols where frequent reassessment is essential. In this case, LiDAR allowed for nuanced observation of postural normalization, such as the reduction in shoulder obliquity and coronal imbalance, metrics not fully captured by radiographic measurement alone. It also facilitated patient engagement, offering visual feedback that supported her understanding of progress and reinforced adherence to corrective strategies. For example, early on in the treatment protocol where the patient was initially struggling to "feel" the corrective position (and therefore was unsure if she was doing it correctly outside of the clinic), LiDAR scans provided immediate visual feedback, helping the patient confirm the corrective posture even before proprioceptive awareness of the position had fully developed. As surface topography technologies continue to evolve, their integration into scoliosis care may redefine how clinicians assess, monitor, and communicate structural change, especially in adult populations where repeat x-rays are prohibited[10-12].

The patient's high level of engagement and prior experience with self-directed corrective exercise likely enhanced the observed outcomes. Her ability to internalise postural cues and apply them across diverse movement contexts, such as climbing and callisthenics, suggests that the intervention facilitated global postural integration, enabling the transfer of corrective strategies into functional, real-world contexts[7,15,26].

Limitations and Future Directions

This case report presents a single-subject intervention without a control group, limiting the generalisability of its findings. While the observed improvements in Cobb angles, proprioceptive awareness and symptom burden are compelling, it is important that we do not discount the interference of placebo effects and the influence of contextual factors. The strong therapeutic alliance, patient's high baseline motivation and her prior experience with corrective exercise may have amplified outcomes beyond what might be expected in a broader clinical population.

Compliance and adherence to PSSE programmes remains under-reported and inconsistently defined in the scoliosis literature. Critically, adherence is often entirely omitted from research, and no consensus exists on what constitutes sufficient compliance for therapeutic benefit28. In this case, although the patient demonstrated high compliance and motivation, which likely enhanced the effects of the intervention, no standardised measure of adherence was employed. Future research should prioritise the development and consistent use of validated adherence measures, alongside strategies that support motivation and long-term engagement in adult populations. Future research may also benefit from examining the role of high-frequency, home-based PSSE protocols, such as was used in this case. While the patient showed strong engagement and apparent benefit, the specific contribution of dosage, frequency, and self-directed practice remains unclear. Investigations into how these variables influence outcomes could help clarify optimal parameters and inform more personalised, scalable interventions. More research investigating the reproducibility off these outcomes in larger cohorts, ideally using controlled trials directly comparing these multimodal interventions with standard PSSE. Investigations into the neurophysiological mechanisms underpinning proprioceptive change, as well as the role of embodied learning in sustaining postural correction, may further illuminate the biopsychosocial dimensions of adult scoliosis care.

CONCLUSION

This case highlights the potential for meaningful structural and functional improvement in adult scoliosis through a targeted, multimodal conservative intervention. This patient, presenting with a mild thoracic-primary S-shaped scoliosis and long-standing postural and symptomatic burden, achieved apparent substantial curve reduction, postural normalisation and symptom relief over a 16-week programme integrating manual therapy, CBP-based traction, and Schroth-based PSSE[6,7,15,21,22].

The use of 3D LiDAR surface topography provided a non-ionizing, high-fidelity method for monitoring curve progression and postural adaptation. Its strong concordance with radiographic metrics and ability to capture dynamic postural variables enhanced both clinical decision-making and patient engagement10-12. As supported by recent literature, surface topography technologies are increasingly recognized as valid tools for scoliosis assessment, particularly in contexts where radiation exposure and frequent follow-up scans are a concern[10-12]. However, further research on the long-term use of 3D LiDAR surface topography to monitor curve progression in scoliosis is needed.

Whilst this patient would not have been a surgical candidate, she may have faced future supportive bracing or functional limitations had her curve progressed[8,9]. The intervention described here may have stabilised and reversed her curvature, but also addressed the psychological and functional dimensions of her condition, factors which are often under-represented in the scoliosis treatment literature[1,2,4,5] where the focus is largely on Cobb angles. In adult populations, where structural rigidity and psychological burden often coexist[8,9], this could offer a pathway toward more embodied change and functional resilience. Further research is needed to explore the reproducibility of these outcomes, the long-term sustainability of curve reduction via conservative treatment, and the comparative efficacy of multimodal care versus conventional physiotherapy or bracing alone[6,7,15,20,26].

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