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Improvement in vocal performance and musculoskeletal function following subluxation-based Chiropractic care in a professional singer: A case report

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Background: A 42-year-old professional opera singer presented with postural imbalance, musculoskeletal pain, and chronic respiratory issues as a result of long COVID. He sought Chiropractic care with a primary concern relating to his escalating musculoskeletal issues interfering with his career.

Intervention: Chiropractic care using Advanced BioStructural Correction and Endonasal Cranial Correction was provided over an initial care period of 24 visits.

Outcomes: The patient reported substantial improvements in posture, pain, breathing, and overall wellbeing. He also reported marked improvements in vocal performance, including increased vocal range, reduced warm-up time, and greater vocal consistency. This occurred concomitant with marked improvements in his subluxation findings and other objective measures. Significantly, vocal performance (including an increased vocal range) was reported at the conclusion of the described care period.

Conclusion: Correction of structural subluxations may influence posture and neuromuscular coordination relevant to vocal performance. Further research using objective measures of vocal function is warranted.

Indexing Terms: Chiropractic; Subluxation; Advanced Biostructural Correction Technique; ABC; Endonasal; postural imbalance; musculoskeletal pain; professional signer; rib 1.

Introduction

Vocal cord function, while largely taken for granted, is a complex neuromuscular and biomechanical activity that requires coordinated function across multiple body systems. Singing is a vocal cord function that brings these complex functions to the fore as it relies on interaction between respiratory mechanics, laryngeal positioning, and neuromuscular control throughout the torso and cervical spine. (Palaparthi, 2024)

> *... he reported improved access to his full vocal range, including a full octave of additional notes at the lower end of his range that had previously struggled, or been unable, to produce ... '*

The human voice is therefore not produced solely within the larynx but emerges from coordinated activity across the entire body and even inside the brainstem itself. (Beylk, 2021; Scholz, 2024) Subtle disturbances in posture or movement patterns may alter respiratory mechanics or increase muscular tension in ways that influence vocal performance. When a person is a professional singer, projection of the voice when singing means there is a high level of demand placed on these functions.

Singing requires the generation of subglottal pressure through controlled airflow from the lungs while the vocal folds vibrate to produce sound. The thoracic cavity, diaphragm, rib cage, and spinal posture all contribute to this process. (Traser, 2020) Efficient breath support depends on the ability of the rib cage and spine to move freely while maintaining structural stability. Disturbances in spinal alignment or muscular balance may therefore affect the singer's ability to generate and control airflow. (Shin, 2020)

In addition to respiratory mechanics, the position of the larynx (as controlled by motor cortices in the brain) plays an important role in vocal production. (Beylk, 2021) Optimal vocal tone requires the larynx to remain in a relatively neutral and relaxed position. When postural imbalance or musculoskeletal tension interferes with this positioning, singers may compensate through additional muscular contraction within the neck and surrounding tissues. These compensatory strategies may allow singers to produce desired notes in the short term but may also increase strain on the vocal folds and surrounding structures.

Because of these biomechanical demands, professional singers often seek care from a variety of healthcare practitioners, including vocal coaches, physiotherapists, osteopaths, and other manual therapists. These practitioners often focus on improving posture, breathing efficiency, and musculoskeletal function to support vocal performance and longevity within a singing career.

Within the Chiropractic context, we know that rib excursion, posture, and respiration may all be affected by subluxation and by the adjustment. However, there is a paucity of literature pertaining to how that might affect vocal cord function.

Basic science research indicates that postural dysfunction has been associated with altered breathing patterns and increased muscular tension throughout the cervical and thoracic regions. These changes may influence vocal performance by affecting the mechanics of respiration and the positioning of the larynx. (Cardoso, 2019) For individuals whose profession relies on precise vocal control, even small changes in musculoskeletal function may produce noticeable differences in performance.

This case report describes the outcomes of subluxation-based Chiropractic care in a professional opera singer presenting with postural imbalance, musculoskeletal pain, and declining vocal function.

Case details

A 42-year-old male professional opera singer presented for Chiropractic care with a history of progressive musculoskeletal discomfort and chronic respiratory problems as a result of long COVID. The patient described himself as moderately active and reported limited previous engagement with a Chiropractor. His medical history included medically managed ADHD. He had previously been diagnosed as hypermobile and also reported ongoing symptoms following long COVID infection, including reduced lung capacity, poor posture (which the patient described as 'poor alignment', intermittent brain fog, and reduced overall energy levels.

The patient reported that the physical demands of professional singing had placed increasing strain on his body over time. His primary physical complaints included persistent aching and pain within the left side of the pelvis and upper leg, a sensation of stiffness and compression in the lower back, and chronic tightness in the neck, upper trapezius muscles, and jaw. He also described severe pronation of both feet and intermittent episodes of ankle inflammation. In addition to these musculoskeletal complaints, the patient reported a sense of general postural imbalance that he believed contributed to his physical discomfort.

The patient expressed concern that these physical issues were beginning to impact his performance as an opera singer, and now required ongoing self-management to address this as effectively as possible.

> The patient explained that singing at a professional level requires precise control of breath support and muscular coordination throughout the body. Increasing physical strain had begun to affect both his endurance and his ability to access his full vocal range.

A clinical examination upon presentation revealed significant global postural imbalance. Visual and photographic postural analysis (see images) demonstrated forward head posture, bilateral internal rotation of the shoulders, increased thoracolumbar kyphosis, and reduced lumbar lordosis. The pelvis demonstrated a posterior tilt and the patient exhibited pronounced bilateral foot pronation.

Functional movement assessment was conducted using the Selective Functional Movement Assessment protocol. The patient scored six out of twenty-five, indicating substantial movement dysfunction and limited functional capacity across multiple movement patterns.

Neurological assessment using the Fukuda stepping test demonstrated approximately 45° of rotation within 15 seconds, suggesting possible imbalance in vestibular or neurological integration. Orthopaedic examination reproduced symptoms of lower back discomfort during the slump test and Milgram's test. The FABER test reproduced pain in the lower back and anterior hip on the right side. Additional testing including the Homer Pheasant Test and Yeoman's tests reproduced lower back pain and movement restriction.

Muscle palpation revealed areas of tenderness and hypertonicity in the cervical musculature bilaterally, the upper trapezius muscles, the right quadratus lumborum, and the right psoas.

Several structural subluxations were identified consistent with patterns commonly addressed through Advanced BioStructural Correction procedures. These included anterior translation of the C7, T4, T12, and L5 vertebrae. An anterior-inferior displacement of the first rib was also identified. Additional findings included meningeal adhesions and a cranial subluxation involving the sphenoid.

Management

Chiropractic care was provided using Advanced BioStructural Correction procedures in combination with Endonasal Cranial Correction techniques. These procedures were selected to address the structural distortions identified during the initial examination.

Care recommendations also included ergonomic advice aimed at improving sleeping posture, sitting position, and footwear selection to support improved structural alignment.

An initial care schedule of twice weekly visits for twelve weeks was recommended. However, the patient's professional commitments involved frequent travel for performances, which created extended intervals between some visits. As a result, care was delivered in several intensive periods during which the patient attended twice weekly while in town.

The primary goals of care were to improve spinal posture and structural balance, support respiratory function, reduce musculoskeletal pain, improve functional movement patterns, and support the patient's vocal performance and career longevity.

Reviews

First review after 12 visits (photographic assessment and subjective progress report) and second review after 24 visits (photographic assessment, subjective progress report and repeat of all assessments during initial consultation).

His schedule (mentioned above) made timing of care a challenge.

Outcomes

Outcome measures included repeat photographic postural analysis, repeat Selective Functional Movement Assessment testing, reassessment of orthopaedic tests, and subjective outcome reporting by the patient.

After twenty-four visits, the patient reported approximately 80% improvement in his presenting musculoskeletal symptoms and posture. He also reported noticeable improvements in breathing, sleep quality, energy levels, mood, mental clarity, overall wellbeing, and general movement.

The SFMA taken upon presentation was now just a 2/24. He showed no pain on Millgrams, FABER, Yeomans or Homer Pheasant tests.

> The most significant outcome reported by the patient related to improvements in vocal performance. As a professional singer, he described these changes as both unexpected and highly meaningful to his career.

With specific regard to vocal improvements, the patient reported that the amount of vocal preparation required before performing had significantly reduced. Previously, he required approximately 15 to 20 minutes of warm-up exercises before singing. Following Chiropractic adjustments, he reported being able to access his singing voice almost immediately. Over time, these improvements persisted between visits.

He also reported improved access to his full vocal range, including a full octave of additional notes at the lower end of his range that had previously struggled, or been unable, to produce. The

quality and consistency of his voice improved and he described singing as requiring significantly less physical effort.

Prior to engaging with Chiropractic care, he would sing at a range of 90 to 95 dB, a measure taken regularly as part of his professional work. He is now able to sing at 115 dB. These metrics effectively confirm his ability to deliver more vocal power, range and quality than prior to care.

The patient expressed that these changes had a substantial impact on his professional outlook. He believed that the improvements in vocal performance had extended the longevity of his singing career and allowed him to continue performing at a level he had previously feared might no longer be possible.

Discussion

This case highlights the potential relationship between spinal biomechanics, neuromuscular coordination, and vocal performance. Professional singing requires coordinated interaction between respiratory mechanics, spinal posture, and the neuromuscular control of the vocal tract. It also presents for consideration, the hypothesis that vocal cord function may respond to subluxation-based care, given greater sensorimotor integration and nervous system coherence.

The mechanisms behind such improvements have yet to be fully researched as there is a paucity of literature about the topic in the Chiropractic context.

We know that sound production occurs when the vocal folds approximate and vibrate as airflow passes between them. The strength and quality of the sound depend largely on the subglottal pressure generated through controlled respiratory effort. This pressure is influenced by the coordinated function of the diaphragm, rib cage, and thoracic spine. Restrictions within the spine or surrounding musculature may therefore alter respiratory mechanics and influence vocal production. Subluxations may also create difficulties and distortions when it comes to sensorimotor integration between the brain and muscle.

The link between subluxation, rib excursion and thus diaphragmatic support of vocal performance is not documented by Chiropractic research as yet. However, it stands to reason that adjusting the subluxation would directly impact respiratory mechanics. Part of the ABC technique is addressing anterior rib subluxation at each visit. This is less of a primary subluxation and more of an accessory movement to support the correction of spinal subluxation. Thus rib excursion will inherently be connected to spinal subluxation as part of a compensatory mechanism for subluxation. Thus, rib excursion is addressed both directly and indirectly as part of ABC's approach.

For optimal vocal performance, the larynx must remain in a relatively relaxed and neutral position. (Beylk, 2021) When postural imbalance or musculoskeletal tension interferes with this positioning, singers may compensate by using additional muscular contraction to reposition the larynx. While this may allow them to produce required notes, it may also increase strain on the vocal folds and surrounding tissues.

In this case, correction of structural subluxations appeared to reduce global postural distortion and muscular tension. The patient reported that these structural changes allowed his body to maintain a more relaxed and efficient position during singing. This may have reduced compensatory muscular effort within the neck and laryngeal region, allowing improved vocal production with less strain.

The improvements described by the patient were particularly meaningful given the physical demands of professional singing and the long duration of his career. He reported that the changes

exceeded those achieved through other therapies during more than twenty years of professional performance.

Although this case report relies primarily on subjective outcomes and clinical assessment findings, it suggests that spinal structure and posture may influence aspects of vocal performance. Future inquiry examining this relationship using objective measurements of vocal range, sound pressure, and respiratory function may help clarify the mechanisms involved.

Conclusion

This case report describes improvements in posture, musculoskeletal symptoms, and vocal performance in a professional opera singer receiving subluxation-based Chiropractic care. Correction of structural subluxations may influence neuromuscular coordination and respiratory mechanics relevant to vocal production.

Further research incorporating objective measurements of vocal performance may help clarify the potential role of Chiropractic care in supporting professional voice users.

Evidence context

This descriptive study is an observational design and is limited as a case report n = 1, lacking controls. The effect of potential confounding factors, including comorbidities, cannot be excluded. We recognise that subluxation identification and correction is the art of the individual Chiropractor.

The findings could support the clinically relevant hypothesis that the identification and correction of spinal and 1st rib subluxation are modifiable contributors to the effective management and resolution of decreasing singing performance.

This report is eligible for inclusion as 'expertise' bringing clinical insights into the JBI FAME evidential ring (JBI Manual for Evidence Synthesis; 2024) to inform evidence-based healthcare in general and the science of Chiropractic in particular.

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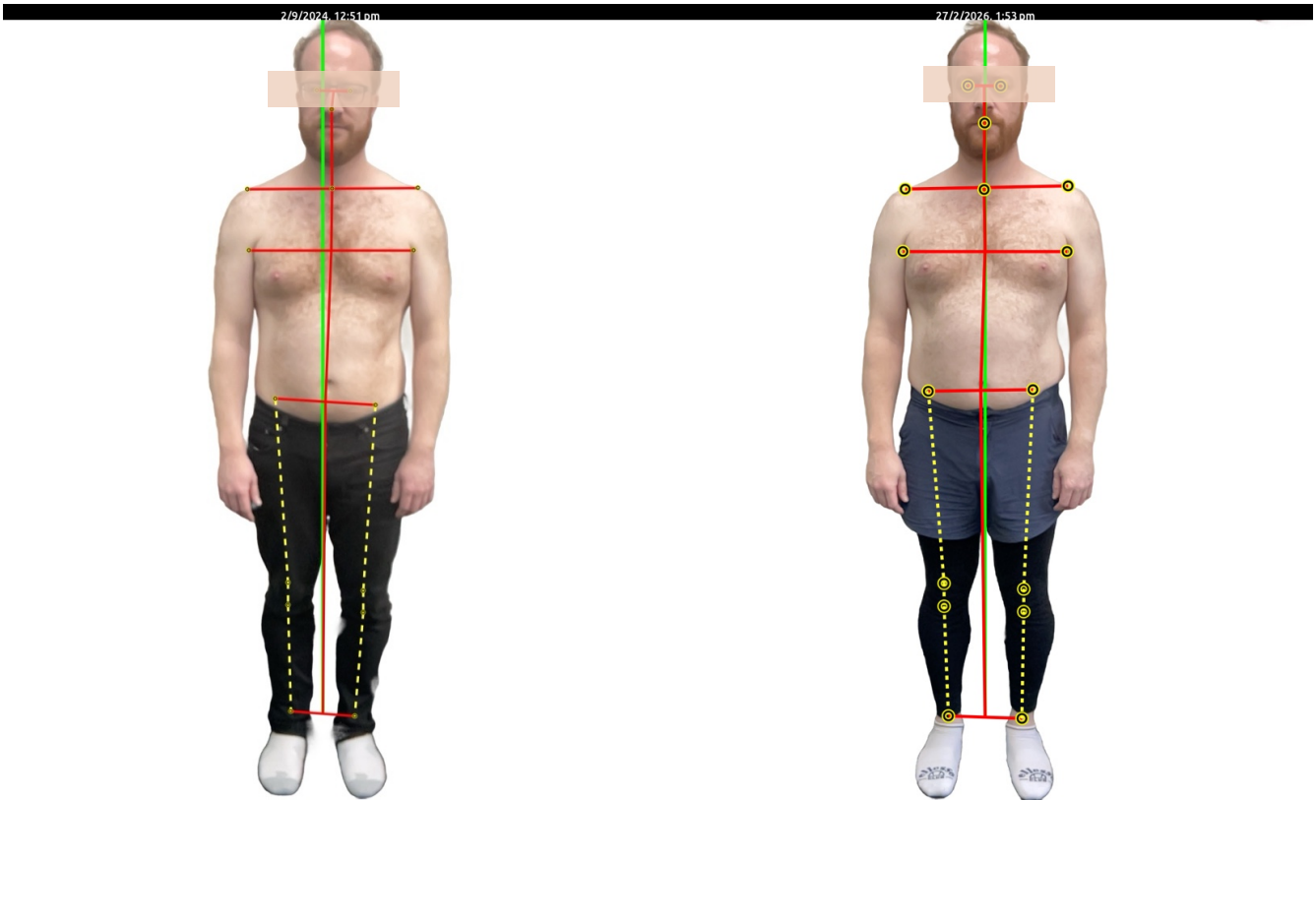
On admission and post care postural analyses



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About the Chiropractor

Dr Ben Coupe graduated with a Bachelor of Chiropractic Science from *Macquarie University* in 2003, and achieved a Master of Chiropractic from *Macquarie University* in 2005. He then gained his certification in *Advanced Biostructural Correction* and became an advanced instructor in 2011. Ben loves seeing a variety of people in his practice, from gym junkies to office workers but especially to people who are looking to get the most out of their body. Nothing excites him more than getting people to realise their bodies own innate potential. He and his wife Dr Samantha Coupe are both ABC chiropractors in Melbourne, Australia