

CASE STUDY

Resolution of Asthma and other Functional Disorders Following Chiropractic Care to Reduce Vertebral Subluxations in a Nine Year Old Male: A Case Report

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Abstract

Objective: The purpose of this study is to report on the improvement of asthma and numerous other functional disorders in a 9-year-old child undergoing chiropractic care to reduce vertebral subluxation.

Clinical Features: The patient had been diagnosed with chronic asthma along with several other functional disorders including: insomnia, headaches, dizziness, neck pain, low back pain, stomachaches, constipation, diarrhea, allergies, eczema and attention deficit hyperactivity disorder. He underwent medical intervention throughout his life and had multiple visits to the emergency room. Multiple levels of vertebral subluxation were found on examination along with objective evidence of dysponesis and dysautonomia determined through SEMG and thermal scanning.

Intervention and Outcome: The patient underwent chiropractic care to reduce vertebral subluxations and saw positive results. His asthma, along with all other co-morbidities resolved, he reduced his need for medication to PRN and has not had an emergency room visit since beginning care.

Conclusion: This case study shows that chiropractic care to reduce vertebral subluxations may lead to improved health outcomes. It adds to the current literature on the positive outcomes of chiropractic care and children with asthma and other functional disorders. Further research is needed on chiropractic intervention, asthma, immunity, functional disorders and their relationship to the vertebral subluxation.

Key Words: *Chiropractic, Diversified technique, immunity, asthma, bodily distress syndrome, functional disorder, thermography, surface electromyography, vertebral subluxation, adjustment, dysponesis, dysautonomia.*

Introduction

Aazein was the original Greek term used for asthma by early texts from Hippocrates who defined it as “panting” and to “exhale with open mouth”. Due to the level of knowledge in that era, the definition was derived solely from observation. It was merely a definition taken by empirical means due to symptomatology.¹ By the late 1800’s asthma was classified

as a disease. More criteria for the diagnosis of asthma was set by the father of modern medicine Sir William Osler in one of his earliest textbooks.² In our current society asthma has come to be a common entity within the household. This serious issue has progressed without solution. Discussed later in this paper, the increase in asthma over the last 30

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years is something that should not be ignored.³ Currently the treatments for asthma consist of interventions that remove or decrease symptomatology and sometimes interventions that involve lifesaving procedures. The purpose of this paper is not to ignore the symptom based biological responses, but to discuss the neurobiological aspect of immunity related to this disease utilizing a case of a 9-year-old child who underwent subluxation based chiropractic care.

Epidemiology

In 2012, the Centers for Disease Control and Prevention published their monitoring statistics on childhood disease. They reported that approximately 10 million children were diagnosed with asthma. 6.8 million of those children continue to live with their diagnosis.⁴ These statistics go much deeper than purely numbers. It also involves socio-economic status. Children that grow up in poverty have a significant percentage increase in being diagnosed with asthma. Another revealing factor on children health statistics is children who have overall health compromise have a 3 ½ times more likely of being diagnosed with asthma and are five times more susceptible to retaining said diagnosis.⁴ This socio-economic effect may be overlooked, but is very important to bring to the forefront. In the time period between 2002 and 2007, the cost of asthma on our economy was 56 billion dollars. In 2008 alone, there were an estimated 14.4 million days that children were absent from school in the United States.⁵ High absenteeism rates have been shown to be associated with lower academic performance and dropout rates.⁶ There is a two-fold issue when it comes to the prevalence of asthma in our society. The first concerns what was previously shown statistically. The second and just as important to understand is that in the last 30 years there has been a steady growth in asthma prevalence since 1980.⁷

Current Allopathic Treatment

The current allopathic treatment protocol for individuals who present with asthma is broken up into a four-category system.⁸

1. Assessment and monitoring of asthma severity and control.
2. Education for a partnership in care.
3. Control of environmental factors and co-morbid conditions that affect asthma.
4. Medications.

The first category is the most important portion of the four because this could potentially be a life-threatening situation and may need emergency intervention. This category consists of taking a thorough clinical history of the child's asthma. This is also where a comprehensive history of the parents takes place to assess genetic predisposition.⁸ A plan for respiratory spirometry is completed at this point to assess pulmonary function.⁹ The second category is educating the patient about asthma and what is involved with the management plan. This includes what the child may have to do to keep from exacerbating the symptoms, medication use, future expectations, and parental involvement. The third category will assess the child's irritants and their exposure to them. If they have co-morbidities, they will be taken into

account at this point. The fourth category is where the physician decides what treatment and medications the child will need short-term and long-term.⁸ There are currently six main classes of drugs that are used for asthma. They consist of bronchodilators, corticosteroids, leukotriene modifiers, mast cell stabilizers, and methylxanthines. Other drugs used consist of immunomodulators and in a small amount of cases magnesium, methotrexates, heparin, and colchicines are used.¹⁰ The medication schedule is a six step process that has a check and balance system to ensure continuous assessment throughout the process. The preferred method of pharmacological treatment is a glucocorticosteroid (GCS) inhalant. In children younger than five it is not recommended for long-term use. It is not standard practice to use oral GCS unless in emergency situations.¹¹

When looking at cases such as asthma, the co-morbidities should not be ignored. They may have a multitude of issues that are consistent with *functional disorders*. Functional disorder is hard to define as a single entity because individuals will present with many different symptoms that may or may not be related. They may have problems in different organ systems and those problems may only affect a portion of that system. Doctors tend to diagnose each problem in its own entity and there is an overall functional problem organically or non-organically at hand. The physicians don't have all the criteria to diagnose each problem, but with the all the problems grouped together they can start diagnosing them with functional disorders.¹²

A new category of Functional Disorder that acts more as an umbrella over different functional disorders is Bodily Distress Syndrome (BDS). BDS diagnosis has four main categories in its diagnosis that include cardiopulmonary, gastrointestinal, musculoskeletal and general symptomatology. The main role of the physician to be able to diagnose this, is having multiple problems in which they call medically unexplained symptoms.¹³ Bodily Distress Syndrome allows for diagnostic criteria that helps break down the confusion on diagnosing multiple different functional disorders. It acts as a blanket over all of them so when the patient has different problems that do not fit into one separate functional disorder, this diagnosis can be made. This does not mean that it is a general diagnosis; it just covers the entity that the other functional disorders do not. The limitation to this diagnosis is the same as a diagnosis of a functional disorder. It is taken on an empirical basis from mostly subjective findings.¹⁴

Etiology

"Asthma is a disease of diffuse airway inflammation caused by a variety of triggering stimuli resulting in partially or completely reversible bronchoconstriction".¹⁰ There is no definitive answer to the true causation of asthma in current medical research. The current theory is that it is a combination of genetic pre-disposition combined with a variety of environmental factors.¹⁵ Asthma is a bronchial tube disorder that is caused by an immune response to a variety of stimuli that causes airways to hyper react to its environmental input. There are four categories of asthma that currently exist. They include bronchoconstriction, airway edema, airway hyper-responsiveness and airway remodeling. All four of

these categories encompass asthma but may not be involved in all cases. The most obvious category is bronchoconstriction caused by an immune response from inflammatory mediators such as histamine that will contract the smooth muscle of bronchial airways. Airway edema occurs when there is chronic inflammation and leads to hyperplasia and remodels the tissue. The neurological connection to the bronchial tree is apparent. There is direct airway connection via the vagus nerve that produces cholinergic synapses. There are no sympathetic innervations of the smooth muscle, which are mainly controlled by non-adrenergic non-cholinergic fibers. This system is in Figure 1, provided by Lewis et al.¹⁶ This is a very important aspect because this may be the explanation to where the problem may lie. The nervous system and its ability to control the responses is where the chiropractic adjustment can affect the system. If the only focus is on what happens due to the response, the inherent cause is ignored.

Case Report

The presenting patient was a 9-year-old male with a multitude of complaints including a diagnosis of chronic asthma. He had four previous visits to the emergency room with one of those lasting five days in duration. He was using an Albuterol inhaler one to four times per day. The patient also had middle thoracic pain that was aching in nature that had lasted for approximately four years, and was exacerbated when he would sit at school. He also reported having headaches and neck pain accompanied by dizziness. His parents brought him to the chiropractic clinic for holistic healing and pain relief. The patient also reported that it might take him one to three hours to fall asleep at night ever since he was born. The history also revealed that the child had episodes of low back pain, leg and foot pain, colic, sugar cravings, stomachaches, constipation, diarrhea, allergies, behavioral problems, ADHD and eczema. The patient had a history of trauma starting before birth. The mother had pre-eclampsia, as well as an emergency cesarean section. The patient was involved in a car accident when he was six years of age. The car was struck on the side at ten miles per hour, with no reported injuries. At nine years of age the child broke his right arm. His history of food allergies consisted of egg, dairy, nuts, wheat and corn.

Examination

A thorough examination was completed on the patient that included multiple portions to show neuromusculoskeletal system dysfunction. This was done by postural assessment, range of motion assessment, a paraspinal rolling thermal scan, and paraspinal surface electromyography scans which have a high inter-examiner reliability. Rolling thermal was used to compare temperature of the skin and any variations on either side of the spine. This temperature is determined by blood flow in those areas and has shown to be a reliable indicator of autonomic nervous system dysfunction.¹⁷

The clinical importance of using thermography and surface electromyography is based on objective evidence. It allows the clinician to be able to not only have the subjective information collected from the patient, but to objectively look at findings and apply them throughout the case. SEMG is a

better way to assess paraspinal muscle tone than static palpation. With palpation, the doctor may be able to tell there is change in the muscle tone, but there is no way to measure it objectively. With SEMG it allows the clinician to see data on how the muscle is functioning. Lantz pointed out that the commonality of all subluxation concepts include some form of neurologic involvement.¹⁸ SEMG testing allows us to be able to measure this objectively. Thermography is another tool used that allows the clinician to have objective findings for their outcome assessment. McCoy showed the reliability of this in his review of the literature on the usage of thermography.¹⁷ The importance of clinical application of these tools should not be ignored. It creates quantitative data on the function so the clinician can assess the results of care (Figures 2-5).

Intervention

The patient was placed under Diversified technique care. Diversified technique distinguishes itself as low amplitude, high velocity adjustment. The goal is to reintroduce correct motion in a joint that previously had aberrant function. This is found by multiple criteria with motion palpation and static palpation being the main way to assess for abnormal function. It is done by palpating the musculature around each segment feeling for tight musculature, edema, tender areas, and/or lack of movement in the joint. After subluxation is found in that area the doctor then assesses the direction that the vertebrae has subluxated and a vector can be determined for a specific thrust into the vertebrae to introduce normal joint function.¹⁹

The patient was seen for a six-month period at which point a re-assessment was completed. The doctor assessed the patient under a protocol to locate subluxation indicators. This included static palpation, motion palpation and visualization assessment. Throughout the care of the child sacral and first cervical segment subluxation indicators were found more often than other segments: with sacrum subluxation being found 83% of the time and C1 found 48% of the time. There were subluxations also found in the thoracic and lumbar sections throughout the course of care. Throughout care there were extremity subluxations found in the shoulder and knee areas 11% of the time. They were adjusted as needed.

Outcome

When this child started care he had multiple problems found in the examination. His progress in care was seen objectively and subjectively. Objective findings include improvements in dysautonomia and dyspnea as measured by thermography and SEMG readings. The patient's thermography readings showing a slight change while the patient's SEMG readings showed improvement during the course of care. The numbers that are shown on the SEMG readings are evaluated in three separate ways. The first is amplitude, where microvolts are measured and the higher the result the more muscle activity is noted. The second is symmetry and this refers to looking at the differences of the left and right side of the paraspinal scan. The third is frequency, which evaluates frequency shift to show activity of muscle fatigue or non-fatigue.²⁰ Those numbers showed improvement in the patient and are provided in Figures 2-5.

Of note the patient also has not been to the hospital since he started chiropractic care and has been able to reduce the amount of medication use from four times daily to an as needed basis. The patient also had multiple co-morbidities that have also shown improvement. His sleeping has become normal and it no longer takes one to three hours to fall asleep at night. His headaches, stomachaches, constipation, diarrhea, neck pain, and back pain have all have subsided. His parents also reported that his eczema still has some flare-ups but not as badly as before. Regarding his diagnosis of ADHD, he is no longer in need of special accommodations that he had previously been using for two years prior. His quality of life has progressed with all of these issues going away or diminishing. His grades are much better and made honor roll this year while only missing one day of school. Previously he would miss multiple days due to having to be in the hospital for his asthma.

It is noteworthy to see the improvement of his asthmatic symptomatology, but just as important to look at is his improvement in his functional disorders. The improvement in these areas of his health has made his quality of life much better. It has allowed him to live much more comfortably and his bodily stress to decrease.

Discussion

When discussing asthma and chiropractic care in this paper we want to view it in a two-pronged approach. The first being asthma and the current literature supporting chiropractic care regarding its efficacy and results. The second regards immunity, which is more of what we are looking at with subluxation-based care. We are not looking at how chiropractic can help the diagnosis of asthma, but how it affects the immune system so the body can better adapt to its environment. Asthma is treated more as a health outcome due to compromised immune system interaction. When reviewing the literature there are case studies, case reports, and other types of research projects that have shown evidence that chiropractic care has the ability to help children that are asthmatic. Case studies that have been done have used several different chiropractic techniques and yielded positive results. These techniques included Diversified technique,^{21,22} Koren Specific technique,²³ Orthospinology,²⁴ Applied Kinesiology,²⁵ and Activator technique.^{22,26}

Specifically, Alcantara provided subluxation based care using Activator technique with a 7-year-old child with asthma and other health issues since he was five-months old. He now has been able to discontinue the use of medication for asthma and allergies.²⁶

Fedorchuck showed in two separate cases the value of chiropractic care of children with asthmatic symptomatology. The first case was a 7-year-old female who was able to discontinue her daily use of medication after 10 months of Chiropractic Biophysics care. Furthermore, there were objective findings showing nervous system function improvement with pre and post thermography scans. One revealing factor was that her respiratory function was tested by an asthma specialist and they found that her respiratory function was enhanced after subluxation indicators were reduced and worse after the use of medication.²⁷

In Fedorchuck's second case he showed a complete cessation of asthma and allergy medication after the restoration of her cervical curve.²⁸

There also have been some randomized control trials showing the efficacy of chiropractic care on asthma. Graham and Pistolesse conducted a study on 81 patients over a 60-day period and showed a "significantly lower" score on the Modified Oswestry Impairment Rating Scale.²⁹

When studying these cases one at a time it may be difficult to find a similar aspect of care that linked a cause and effect of positive change. When viewing them as a single entity they all have one thing in common; the removal of nervous system interference. As with the case of asthma it is directly linked to the body's immunity and its reaction to stimuli. The neurodystrophic nature of subluxation shows the connection between the nervous system and the immune response with asthma. Understanding that neuroimmunomodulation is key in this subluxation theory. It can be said that if the nervous system had the ability to modulate the immune system correctly the symptomatology of asthma would not express itself. As Korr stated: spinal lesions can create abnormal autonomic nervous system response, specifically sympathetic, this case can be directly linked knowing that asthma involves abnormal neural adaptation.³⁰

A review of literature was completed at Kansas State University on autonomic-immune physiologic processing to further show the link between the nervous system and the immune system. They concluded that the "sympathetic and parasympathetic arms of the ANS play key roles in orchestrating neuroimmune interactions".³¹ The important factor that comes into play here is that the vertebral subluxation complex directly effects the nervous system as Kent also illustrates in his paper on segmental, postural, and tonal models of subluxation.³⁰ In Owens' subluxation tree he states that "complex organisms depend on bidirectional flow of information between the central nervous system and peripheral cells in order to adapt to a changing environment in a coordinated manner" and "interference with information transmission in the nervous system will prevent proper maintenance of health and lead to some degree of dysfunction".³² There has been evidence that with chiropractic care there may be an immune system change in long term care.³³

Ressel and Rudy looked at 650 children who had pelvic dysfunction and their related health problems. Different health issues including asthma and breathing difficulties were assessed. They found that one out of every five children had some type of issue correlating with asthmatics.³⁴

Cohn constructed a review of literature citing many examples of chiropractic care and the immune system. One specific example was a research project that showed that chiropractic adjustments created up to a 48% increase in CD4 cells.³⁵ This is paramount because the CD4 cells are directly linked to immunity and asthmatic reactions.³⁶

Conclusion

The case study completed here adds to the growing evidence

of chiropractic care and its efficacy on children with asthma and other functional disorders. This is shown through the health outcomes of this child and the objective evidence found through improvements in thermography and SEMG readings during the course of care. A noteworthy observation includes that the child has not had to visit the hospital due to asthma for an extended amount of time and is now living a better quality of life since beginning chiropractic care. Viewing asthma through the nervous system and its interaction with the body in this paper is the goal. This shows the neurological and immunological connection, thus creating more motivation to further the research on the topic of asthma and chiropractic. This paper is for health professionals to look more deeply into the intervention considerations, rather than the standard pharmacological route. This case shows evidence of chiropractic care as an important aspect in this patient's ability to improve. Using what was implemented here may help others with the same issues.

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Figures

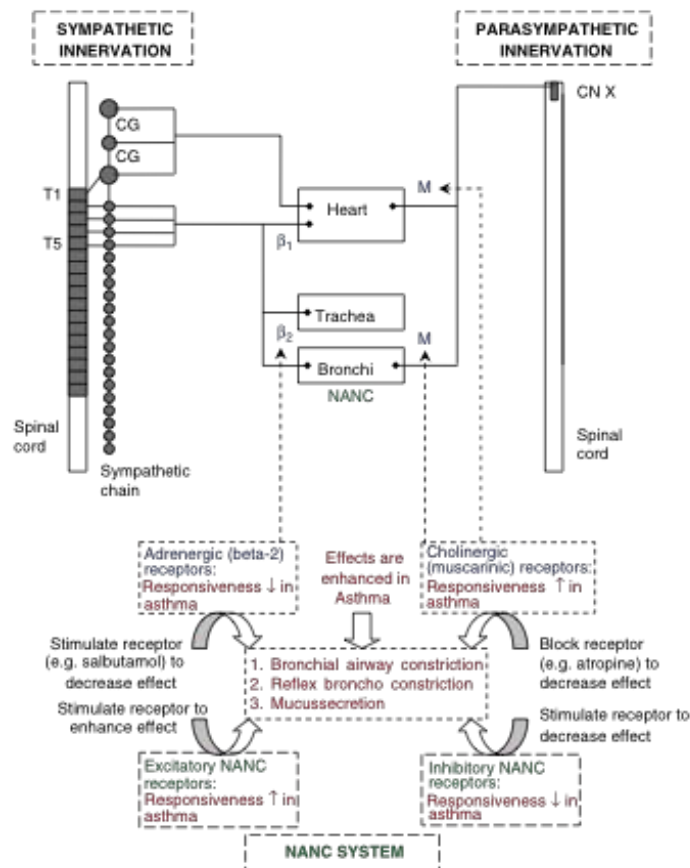


Figure 1 Anatomical and functional organization of the autonomic nervous system and NANC system in the heart and airways. The influence of asthma on the function of these systems is also shown. (CN X—tenth cranial nerve; CG—cervical ganglia; T1, T5—first, tenth thoracic vertebrae; β_1 —beta-1 adrenoceptor; β_2 —beta-2 adrenoceptor; M—muscarinic receptor; NANC—non-adrenergic and non-cholinergic system. Note: There is no sympathetic innervation of airway smooth muscle but airway vasculature does receive sympathetic innervation.)

Figure 1: The figure here shows the connection between the autonomic nervous system and the visceral response of asthma. It shows how the sympathetic system is involved through the adrenergic receptors and the parasympathetic connection to the cholinergic receptors and their respective excitatory response and inhibitory response.

SEMG Scans

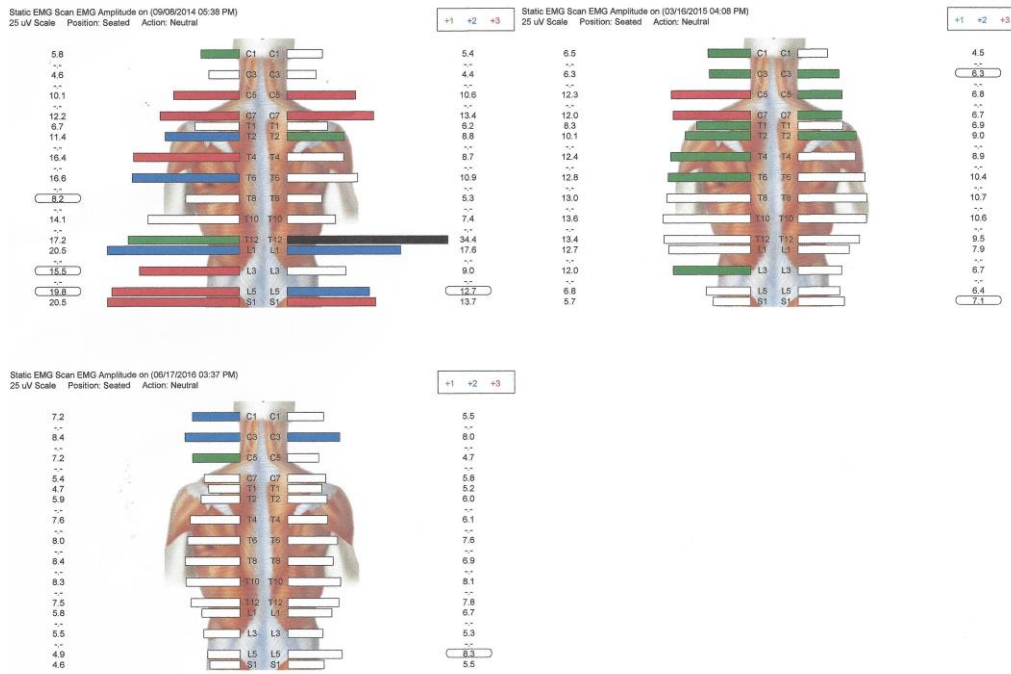


Figure 2: SEMG Scans; Pre, 1st re-evaluation and 2nd re-evaluation: Muscle activity on initial examination shows multiple levels on both sides with increased tone, most prominent is at the T12 level. Also on the left in the lumbar and lower thoracic areas there is a high degree of activity. One of the important aspects about this scan is that neurological activity is high throughout many levels showing evidence of neurological compromise. In the 1st re-evaluation scan we see improvement after the course of care. We see more balanced muscle activity throughout the spine. Most noticeable is the change from the scan at the beginning of care and after the course of care at the T12 level. The muscle activity has shown that it is significantly less. The 2nd re-evaluation shows significant improvement.

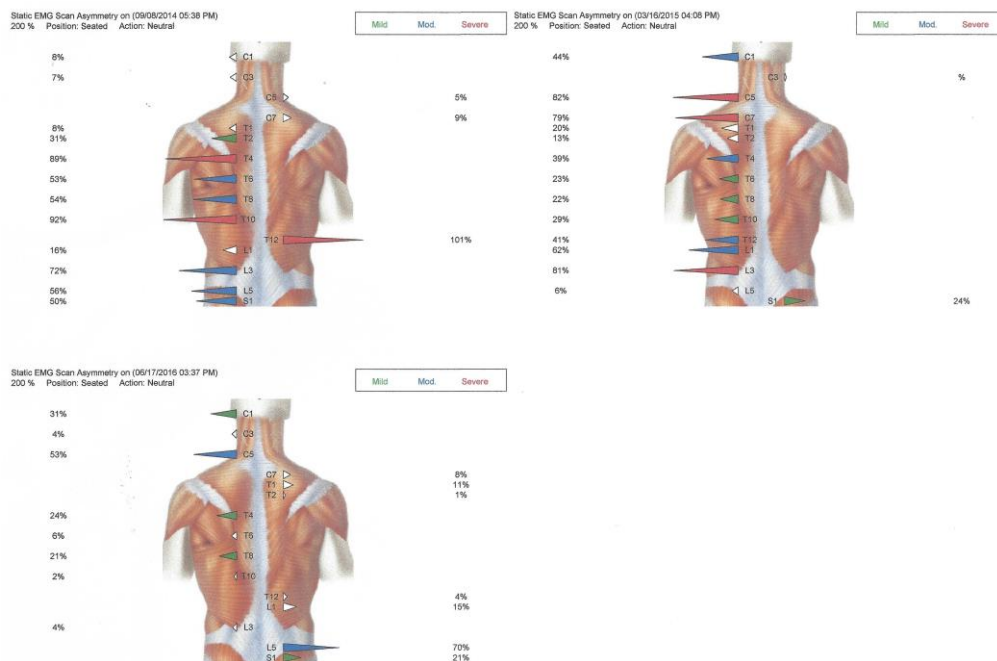


Figure 3: SEMG Asymmetry; Pre, 1st re-evaluation and 2nd re-evaluation: Initial examination scan shows the percentage deviation from left to right. What is shown here that there are many segments that deviate to the left side of the spine compared to the right. The exception is T12 where you see a 101% deviation to the right side of the spine. In the 1st re-evaluation scan we still see deviation of muscle activity to the left compared to the right. The level of T12 is the most noticeable when comparing the pre and post scans. Before it was 101% deviated to the right. In this scan it shows 41% to the left. In the 2nd re-evaluation scan, there is significant improvement.

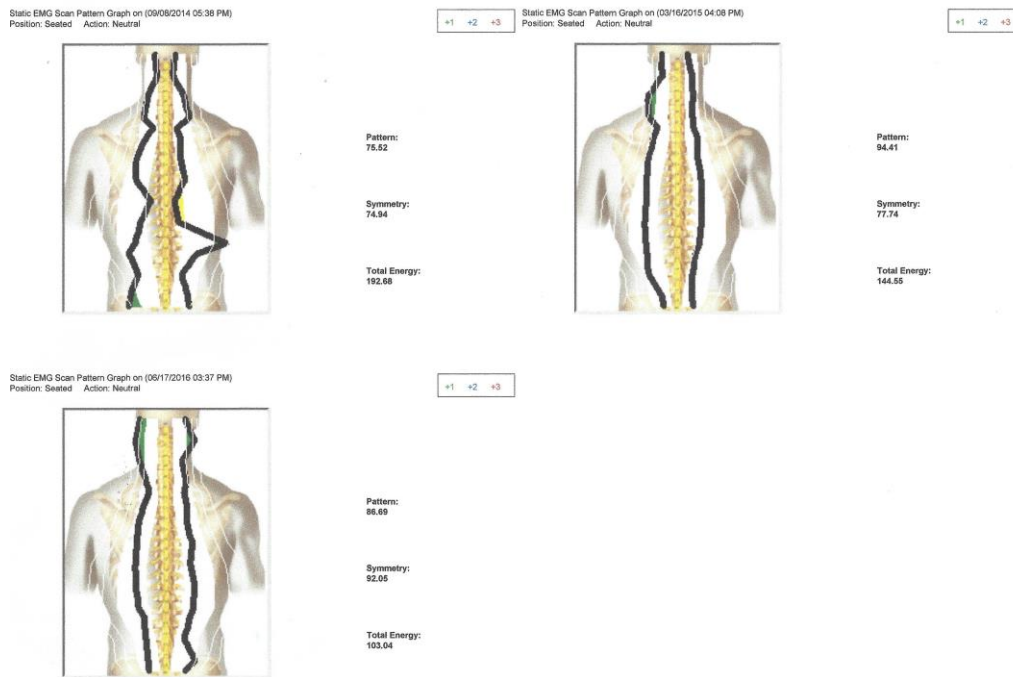


Figure 4: SEMG Pattern Graph; Pre, 1st re-evaluation and 2nd re-evaluation: The three aspects of interpretation here show there is a lack of symmetry throughout the scan with the most prominent being in the lower thoracic and upper lumbar area. Symmetry and pattern in the initial shows roughly a 25% decrease on a scale of 100. The total energy in shows a high-energy expenditure in a static state. The 2nd re-evaluation SEMG scans provided here show objective improvement. The pattern was increased by 18.89 points and the symmetry was increased by 2.8 points. Another change occurred in the energy expenditure and it was decreased by 48.13 points. This shows objectively that that his nervous system function improved through the course of care. The 2nd re-evaluation shows significant improvement.

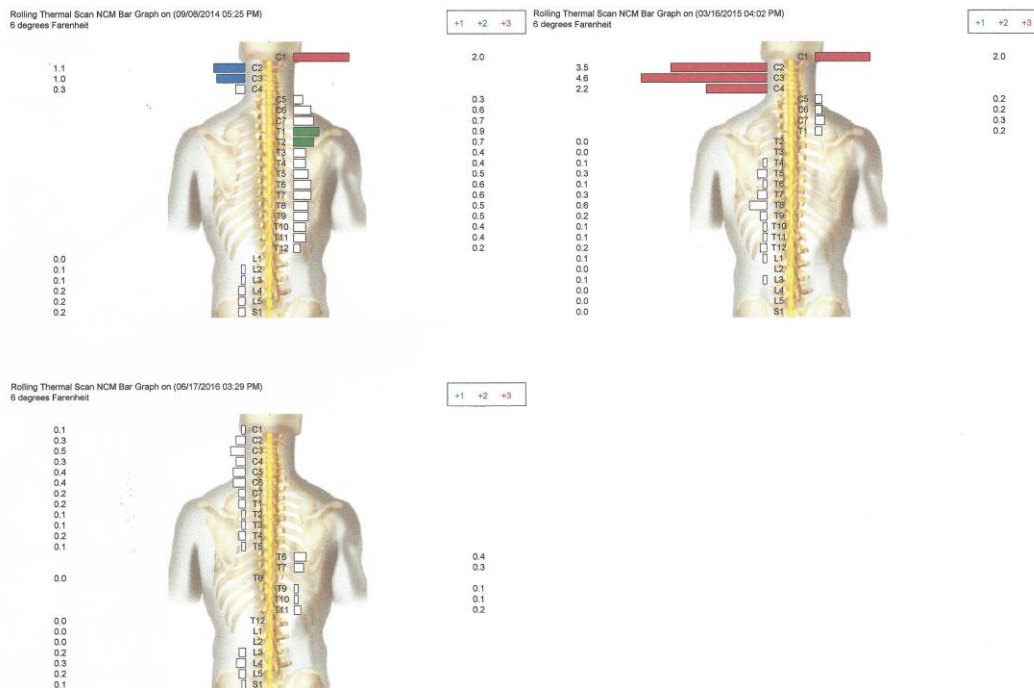


Figure 5: Rolling Thermography Scans: The initial examination shows thermal readings comparing the temperature difference from side to side. The C1 segment shows major deviation to the right compared to the left. Also noted in this scan is that the whole thoracic spine is deviated to the right. This 1st re-evaluation scan shows that the cervical areas are still having major deviation to the right at C1, and major deviations to the left in the middle cervical area. Looking at the rest of the spine temperatures has deviated towards normal from C5 to S1. By the 2nd re-evaluation, there was significant improvement.