

# CASE STUDY

## Resolution of Chronic Seizures in an Infant Undergoing Chiropractic Care for Vertebral Subluxation: A Case Report and Review of the Literature

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### Abstract

**Objective:** To report on the resolution of chronic atonic seizures in an infant undergoing chiropractic care focused on vertebral subluxation.

**Clinical Features:** 15-month-old male infant with history of traumatic birth including Caesarean section and epidural. Infant began experiencing atonic seizures at 6 months of age. Episodes occurred two to three times weekly and lasted one to two minutes. Upper cervical, dorsal, lumbar and pelvic subluxations noted on examination.

**Intervention & Outcome:** Specific chiropractic adjustments directed at subluxations were performed over a period of 8 months. The infant experienced complete resolution of seizures.

**Conclusion:** This case report describes the resolution of atonic seizures in an infant undergoing chiropractic care. Further research is necessary to explore the role of chiropractic in children suffering from seizures.

**Key Words:** *Seizures, epilepsy, syncope, chiropractic, pediatric, adjustment, vertebral subluxation*

### Introduction

Seizures occur due to a disruption in the mechanisms responsible for balancing excitation and inhibition. Disrupting the mechanisms responsible for inhibition of firing or promotion of the mechanisms needed to facilitate excitation may both lead to seizures. Conversely, the opposite will usually bring about prevention of seizure activity.<sup>1</sup>

The incidence and prevalence of epilepsy in children ranges from 41-187/100,000 with a higher incidence in rural areas of underdeveloped countries. Approximately one third of children diagnosed with epilepsy can be given a specific epilepsy syndrome, as defined by the most recently proposed system for organization of epilepsy syndromes.<sup>2</sup>

Epilepsy and seizure activity are linked to academic achievement issues, attention deficit hyperactivity disorder and malformations of cortical development.

### Case Report

#### *History*

The patient in this case was a 15-month-old male infant with history of traumatic birth including Caesarean section and epidural. The infant began experiencing atonic seizures at 6 months of age with episodes occurring two to three times weekly and lasting one to two minutes.

The mother experienced preterm labor and had a history of preterm labor with two prior pregnancies, resulting in the delivery of the first child at 25 weeks who subsequently passed away. Mother had progesterone shots administered to avoid preterm labor. Five ultrasounds were performed during the pregnancy, & she experienced morning sickness and back pain during pregnancy and was hospitalized twice for preterm contractions.

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The delivery was via C-Section at 37 weeks with an epidural administered. There was no fetal distress or meconium staining present. The infant cried strongly immediately, was pink all over, with arms and legs actively moving. He had mild jaundice without administration of lights. No medications or vaccinations were given at the time of birth. The child was circumcised, weighed 6.9 lbs and was 19". He went home on day three.

Six months after birth the boy had seizure-like episodes with unknown etiology. Approximately 8 months later the episodes began again and continued every few days. About one month later the parents presented him for chiropractic evaluation.

The mother reported events of unresponsiveness with associated limpness occurring upon waking from naps when diaper is changed after patient has had a bowel movement. He would also sometimes experience episodes consistent with bowel movements every other day. Each episode lasted approximately 1-2 minutes and happened 2-3x/week but there was no loss of consciousness.

He would suddenly become unreactive and unable to move parts of his body including all four limbs - though sometimes just the lower extremities or one side of the body. His otherwise strong neck muscle tone diminished, and he had a difficult time keeping his head up during an episode. His lips would become cyanotic during some of the episodes, but he did not appear to have any difficulty breathing.

He did not have any tonic-clonic movements or any other involuntary movements of his body with these episodes. Mother reported having checked his heart during an episode with no noticeable abnormalities. She noted his lips would occasionally turn blue with episodes.

The boy was fully vaccinated and had a history of occasionally and purposefully hitting his head. He had an emergency room visit following one episode where he had a seizure following it. He was breastfed without difficulty and had met all milestones. He ate a balanced, healthful diet and lives in a well-bonded stable, supportive home environment.

He had a number of medical tests performed including two EEG's that were interpreted as normal. An MRI and ECG were also done and noted to be normal. He was examined for heart murmur, abnormal biventricular size and function, abnormal valvular structure and function, and large intracardiac shunting due to an Aortic Arch Obstruction. All results were negative. There was no definitive medical diagnosis given.

#### *Examination Findings*

The following reflexes were positive:

- Spinal Galant
- Babinski (Bilaterally)
- Palmar Grasp (Bilaterally)
- Rooting (Bilaterally)
- Tonic Labyrinthian Reflex (Bilaterally)

His gait was normal and he had normal facial and upper and

lower limb symmetry.

At the time of exam he weighed 20.21 lbs, was 2'4" and had a head circumference of L: 24.5cm and R: 25.5 cm. There was a Gluteal Cleft Deviation. Subluxations were noted in the right S/I joint, T9, C1 and right Coronal Suture.

#### *Interventions & Outcome*

The boy was adjusted to reduce subluxations and had cranial adjustments 17 times over the course of 8 months. A mixture of Activator instrument adjusting along with sustained contacts were used. The parents were instructed in exercises that included the use of a paint brush to stimulate bilateral plantar surfaces of the feet and bilateral cheeks. They were instructed to play with lateral proprioception in mind. They were given exercises that included rolling on a ball (on belly, on knees, on feet) and bounce on ball (on belly, on knees, on feet). They were instructed to avoid sugar, wheat and dairy.

Over the 8 months the boy experienced a couple of instances of head trauma, colds and congestion. The seizures gradually tapered until they completely resolved.

#### **Discussion**

The US Centers for Disease Control and Prevention has designated childhood epilepsy a major health problem associated with significant developmental disabilities.<sup>3</sup> Approximately 50 million people globally have been diagnosed with some form of epilepsy with 75% of all 200,000 annual new cases in the United States being children.<sup>4</sup> Cost associated with direct care of epilepsy can be considerable on their own, not taking into consideration indirect fees like those associated with transportation challenges or educational supports among so many others.<sup>5</sup>

Once a diagnosis is obtained, the standard of care for medical management, varies widely dependent upon etiology. It can begin as conservatively as the "wait and see" method and vary to the aggressive end where AED treatment and neurosurgery may be utilized dependent upon the underlying condition. Ultimately, classification of epilepsies and epileptic seizures benefit the patient as it takes in to consideration detailed etiology rather than dependency on neuronal dysfunction in the CNS presenting as symptoms. Treatment can be prescribed more effectively based on the type.<sup>(6,7)</sup> Classification may be broken down in to three main categories: epileptic seizure, epilepsy and syndrome.

Epileptic seizure may be diagnosed by reliance on an eyewitness or video account. According to Aktekin,<sup>7</sup> it is defined as "a transient occurrence of signs and/or symptoms because of abnormal, excessive and synchronous discharges of brain neurons." The location, amplitude, speed and spreading of the pathways of discharge will determine the clinical signs. Epilepsy is "a disorder of the brain, characterized by an enduring predisposition to generate epileptic seizures and by the neurobiologic, cognitive, psychological, and social consequences of this condition." The diversity in etiology is multifactorial and will determine prognosis. Syndrome is "a collection of signs and symptoms that occur together. These include items such as seizure type, etiology, anatomy,

precipitating factors, age of onset, severity, chronicity, diurnal and circadian cycling, and sometimes prognosis.” There is no one single causative factor, it is a collection. Diagnosis is therefore dependent not only on eyewitness account but must also include history and further testing such as EEG.<sup>7</sup>

Malformations of cortical development (MCDs) are a diverse group of pathologies. Developmental delay, family history of seizures may or may not be present and they typically do not display pathognomonic semiologic features. MCDs typically respond poorly to medical management; however, surgical intervention may be a viable option for selected patients though this requires extensive pre-surgical evaluation and developed surgical skill. Unfortunately, the population most affected by this is typically the most destitute and care may be hard to come by.<sup>4</sup>

Children with epilepsy may experience multifaceted challenges. Reilly and Neville note how these children can seem to fall through the cracks of the school system academically due to learning disabilities, cognition abnormalities, behavior/psychiatric status and psychosocial functioning.<sup>8</sup> Many children living with epilepsy underperform academically due to these issues, though not poorly enough to warrant formal educational supports. This can set the child at a disadvantage while adding to the cost the parent may need to pay out of pocket to obtain assistance.

Reilly also asserts “Children with epilepsy and ADHD are likely to be at a higher risk for more negative outcomes in school and in terms of quality of life compared with children with epilepsy alone.” Due to the significant risk for ADHD that a child with epilepsy has, more research focused on intervention of symptoms of ADHD in this population would be efficacious.<sup>9</sup>

#### *Review of Chiropractic Literature*

Langley discussed a case of an eight-year-old female with a history of epilepsy, heart murmur, hypoglycemia, attention deficit disorder and nocturnal enuresis.<sup>10</sup> She had been to many specialists including psychiatrists and neurologists as well as being hospitalized on ten occasions. She was prescribed four AEDs. She had not been breastfed due to a diagnosis of being allergic to breastmilk. When she was presented for a chiropractic evaluation, she was experiencing ten to twelve seizures per day, nightly bedwetting, frequent mood swings, and gastric duress. Her mother was told she would never ride a bicycle and she was currently enrolled in special education classes due to her learning disabilities. She experienced chiropractic adjustments at C1 and C2 at a rate of three times per week. After two weeks the nocturnal enuresis began to resolve and was completely resolved after six months. Her learning disabilities were improving, and she was able to attend regular fifth grade classes with her peer group. After one year of chiropractic management, she experienced only eight to ten seizures per week, was released from psychiatric care, had a strengthened immune response to her environment, can participate in typical age appropriate physical activities and is expected to be off all medications.

A case study done by Lieberman and Hapner-Petron documented the care of a four-year-old male diagnosed with

intractable frontal lobe epilepsy.<sup>11</sup> After a thorough case history was taken a physical examination was performed. Along with a chiropractic evaluation, it was determined that the child was experiencing C1 subluxation. He continued to be analyzed for differences in skin temperature in subsequent visits and was adjusted using Activator technique. The parents noted a reduction in seizure episodes following care and thusly improvement in their child’s quality of life.

Pistolese released a review of literature in 2010 regarding children suffering from epilepsy.<sup>12</sup> He reviewed seventeen reports of children with epilepsy who were receiving chiropractic care. Anticonvulsants were concurrently administered to fourteen out of the seventeen which were alone, unsuccessful in management of the condition. Fifteen of the children received upper cervical care to eliminate vertebral subluxation complexes. All seventeen reported positive outcomes as a result of being under chiropractic care.

Amalu presented a case study regarding a five-year-old boy experiencing cortical blindness due to severe brain damage, cerebral palsy, epilepsy and monthly, recurring otitis media.<sup>13</sup> After a thorough history was taken to include that despite his above reported challenges, he was a very healthy baby until “Two days following a well-child checkup with as inoculation,” he developed colic symptoms and a mild upper respiratory infection resulting in a fever. Once he had fallen asleep, a time noted for increased seizure activity, he developed hypoxemic encephalopathy. He was treated in the emergency room with Phenobarbital which he remained taking for another eighteen months before being switched to Dilantin. Over the course of his care, he saw many specialists who all agreed he would never walk, speak, regain vision or progress in school. His grand mal seizures numbered approximately 30 per day prior to care. Upon evaluation, his atlanto-occipital region was adjusted with the use of the knee-chest table. When he returned for his second visit, his seizure activity had reduced from 30 per day down to 10 per day which continued to improve with care over a ten-month period. He eventually weaned off all anti-epileptic drugs and his diagnosis was changed by his neurologist to non-epileptic. He was also able to develop some improvement in vision, minimally assisted ambulation, increased vocabulary in addition to feeding himself and potty training.

Hyman proposed a case study of a five-year-old male presenting with petit mal seizures that were not controlled pharmaceutically.<sup>14</sup> His history included concurrent bilateral foot flare with associated leg pain and a frequency of four to six absence seizures per hour with the duration lasting four to five seconds each. He began toggle-recoil, upper cervical care at C1, twice a week and was able to reach a frequency of zero to one seizures per day with a duration of two to four seconds each and was eventually able to eliminate the use of all anticonvulsant medications. The patient’s bilateral foot flare and leg pain had also improved.

Goodman and Mosby discussed a five-year-old female who was born breech and suffered through numerous viral infections and repeated cases of otitis media throughout the first three years of her life.<sup>15</sup> At the age of four years and eight months, she experienced a head trauma and within two hours had her first grand mal seizure with the second to follow

within three weeks. Many different pharmaceuticals were prescribed, and the diagnosis of Lennox-Gestaut Syndrome was given. By the time she presented for chiropractic care, she was experiencing thirty to seventy seizures per day and was wearing a helmet, face plate and harness to protect her from falls. Pre and Post adjustment radiographs were taken as a part of the visit in addition to evaluating leg length inequality, increase of pelvic resistance and postural analysis. National Upper Cervical Chiropractic Association (NUCCA) technique was utilized. The radiographs revealed misalignment of the occipito-atlanto-axial region and C1 was adjusted. Day 17 brought about seizure abatement and remained absent for approximately the next four weeks. At the time of publication, her seizures were numbering six or fewer per day with some days being seizure free and her medication dosage had been reduced by half. She was able to speak in five to six-word sentences and at re-evaluation, she showed no discrepancy in leg length and she continues to improve.

Thorough history, neurological evaluation and subsequent classification of epilepsy is essential in the proper management of epilepsy symptoms. Specific chiropractic adjustments have provided correction to vertebral subluxation complexes, often upper cervically, though other times through full spine care in the successful management of epilepsy. This is important when considering if the adjustment is simply restoring blood flow to the brain or is there a larger impact on the central nervous system as a whole. More research in this area is necessary to determine the efficacy and full impact of chiropractic adjustments in resolving chronic seizures in infants as well as the effects on the specific classifications.

#### *Limitations*

The author was unable to find cases in the scientific literature specifically describing the patient's symptomatology. Further limitations included the use of a single case study design which cannot be generalized to the population, in addition to not having a control group to rule out maturation as a factor in improvement of chronic seizures. Moreover, further research is necessary to determine the effectiveness of chiropractic care in resolving chronic seizures in infants.

#### **Conclusion**

Resolution of chronic seizures in infants through chiropractic care is minimally understood. Epilepsy has not only developmental effects but also social and economic consequences as well.<sup>8</sup> The results of this case study and relevant research pertaining to chiropractic's role in reduction and resolution of chronic seizures support the hypothesis that subluxation reduction may have a positive impact on the symptoms associated with epilepsy.

There has been a significant increase in the number of chiropractic research articles available related to epilepsy and seizure disorder over the past thirty years. Goodman et al. reported extreme difficulty locating research shedding a positive light on chiropractic and its effects on patients under care at the time of their publication.<sup>15</sup> Thirty years later, Lieberman and Hapner-Petron were significantly more successful in identifying a larger bank of publications to choose from.<sup>11</sup>

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