CASE STUDY

Improvement in a Child with Gastroesophageal Reflux Disease, Constipation, and Deformational Plagiocephaly Undergoing Chiropractic Care

Robin Swaminathan, D.C.¹ & Laura Hanson, D.C., D.I.C.C.P.²

Abstract

Objective: The chiropractic management of an infant with gastroesophageal reflux disease (GERD), constipation and deformational plagiocephaly is described.

Clinical Features: A 5-month-old female presented for care with complaints of GERD since birth and constipation since she was 4-6 weeks old. At the time of initial presentation medication was not affecting frequency or amount of reflux symptoms. Bilateral flattening of the occiput was noted indicating deformational plagiocephaly.

Intervention and Outcomes: The patient was seen 19 times over approximately 6 months for chiropractic evaluation and management. Chiropractic adjustments included atlas, T2, L4, sacrum and the cranial vault. At the time of a 6-month care reassessment, the patient had ceased taking anti-reflux medication and was regularly having 1 to 2 bowel movements per day. The patient’s plagiocephaly was improved with only slight leveling of the occiput noted.

Conclusions: In this case, restoring proper kinesiological and neurological function by reducing vertebral subluxation restored proper afferent stimulation of the autonomic nervous system resulting in a concomitant reduction in subluxation findings, deformational plagiocephaly and visceral dysfunction.

Key Words: chiropractic, subluxation, GERD, GER, reflux, gastroesophageal, constipation, plagiocephaly, infant

Introduction

The American Academy of Pediatrics defines gastroesophageal reflux (GER) as the passage of gastric contents into the esophagus while GER disease (GERD) is the symptom(s) or complications of GER.¹ Clinical presentation of GERD in the pediatric population may include vomiting, dysphagia, abdominal or substernal pain, slow or absent weight gain, esophagitis and respiratory disorders.¹ GERD is a common complaint in the infant population with estimates of prevalence ranging from 12% to 67% of infants, with incidence peaking at around 4 months of age.²,³ When present, symptoms of GERD are typically seen during the first 5 months of life.² Diagnosis of GERD involves quantifying reflux with the “gold standard” of intra-esophageal pH monitoring, testing for inflammation, and utilizing symptom-assessment questionnaires.⁴

1. Private Practice of Chiropractic - Madison, WI
2. Assistant Professor - Life University College of Chiropractic. Marietta, GA
The North American Society for Pediatric Gastroenterology and Nutrition defines constipation as delayed or difficult defecation for two or more weeks, sufficient to cause significant distress.\(^5\) Constipation is a common complaint in the pediatric population, accounting for 3 to 5 percent of general pediatric visits.\(^6\) The relapse rate of functional constipation in children is high with 30 to 52 percent of children still exhibiting constipation after several years of treatment.\(^5\) Diagnosis of constipation is derived from history as well as a digital rectal examination for compaction of feces.\(^6\)

Plagiocephaly refers to a flattened, asymmetrical development of the cranium due to craniosynostosis causing anterior plagiocephaly or external forces applied to the soft infant skull either in-utero or after birth resulting in posterior plagiocephaly.\(^7\) The vast majority of cases of plagiocephaly involve posterior deformation; deformational plagiocephaly prevalence ranges between estimates of 19.7% to 48% in infants at 4 months of age.\(^7\) While supine sleeping is associated with lower rates of sudden infant death syndrome (SIDS), it is also associated with higher rates of asymmetries, restricted ranges of motion and deformational plagiocephaly persisting to two to three years of age.\(^5\) Infants who sleep in the supine position with minimal prone “tummy time” while awake are also more likely to experience global delays in developmental milestones, particularly those related to motor skills, when compared to infants who sleep in the prone position.\(^7\)\(^8\)

This paper presents the chiropractic management of a 5-month-old female with complaints of GERD, constipation and deformational plagiocephaly.

**Case Report**

**History**

A 5-month-old female presented for care with gastroesophageal reflux, constipation and plagiocephaly. The patient had previously been under care with us for two visits, but then had a gap in care of approximately 3 months. The patient had experienced idiopathic GERD since birth, involving approximately 8-10 regurgitations per day consisting of 2-4 tablespoons of gastric content. The reflux was exacerbated by movement of the infant or sitting up on her own for over 5 minutes. The patient was breastfed since birth and her diet was supplemented with small amounts of baby oatmeal.

The patient was initially prescribed Axid\textsuperscript{TM} (Nizatidine), but due to difficulty with administration was soon switched to Prevacid\textsuperscript{TM} (Lansoprazole). Prevacid\textsuperscript{TM} was administered at a dosage of 15 mcg per day, half in the morning and half in the evening. At the time of initial presentation Prevacid\textsuperscript{TM} was not affecting frequency or amount of reflux symptoms.

Concurrently, the patient had experienced constipation since she was 4 to 6 weeks old. She experienced a bowel movement approximately every 3 days. Prior to bowel movements every 3 days the patient would exhibit discomfort and gassiness. Her mother was administering watered down juice or glycerin suppositories to manage the constipation with limited success.

The patient napped daily for approximately 3 hours and slept well for approximately 8 hours at night. She required swaddling whenever she slept and was consistently placed in the supine position when awake due to irritability when placed prone.

**Chiropractic Examination**

Initial examination revealed rough and dry skin over most of the child’s body, a persistent placing reflex, bilateral sternocleidomastoid hypertonicity, hypertonicity of right suboccipital muscles, a right head tilt, and bilateral restricted external hip rotation. The patient had significant occipital plagiocephaly presenting as bilateral flattening of the occipital region, and a raised coronal suture. Fixation and muscle hypertonicity in the T6-T9, L2-L4 and sacral region were noted. The patient had low muscle tone in the left extremities and an asymmetric right facial response. When placed in the prone position the patient would scream yet remained with her face against the examination table, unable to push up with her arms and extend posteriorly.

The patient was extremely agitated during the examination, resisting separation from her mother and interaction with clinic staff. She exhibited nearly continuous crying and was unable to be soothed either by her mother or staff members.

Initial diagnostic impressions included GERD, functional constipation, deformational plagiocephaly, right hemisphericity and cervical, thoracic and sacral subluxations.

**Intervention**

The patient was seen 19 times over approximately 6 months for chiropractic evaluation and management. Initially, visits consisted of light mobilization of the left extremities to encourage proprioceptive input and activation of the left hemisphere as well as spinal evaluation.\(^9\) Extremity mobilization consisted of flexion and extension and slight compression of each joint of the left extremities. Spinal segments adjusted varied between visits; over the course of care the patient exhibited subluxations of atlas, T2, L4 and sacrum.

Atlas adjustments consisted of a light sustained vibratory contact of the clinician’s index finger over the left atlas transverse process with a lateral to medial vector.\(^9\) Contact was sustained for approximately 8 to 10 seconds. T2 and L4 adjustments consisted of a light digital spinous process contact with a posterior to anterior vector.\(^9\) Sacral correction consisted of a light thumb contact on the right sacrotuberous ligament with an anterior to posterior and medial to lateral vector.\(^9\) This contact was held for approximately 30 seconds while slowly rotating the hand so that the clinician’s fingers were directed cephalad by the end of the intervention.

Many of the patient’s visits consisted of cranial contact alone. Cranial adjustments consisted of light contacts on each of the bones of the cranial vault while the patient’s mother applied caudal traction on the patient’s pelvic girdle.\(^11\) The patient’s mother would place one hand supporting the patient’s gluteal region, cradling the sacrum, while the other hand was placed across the patient’s anterior superior iliac spines. Light caudal...
traction was then applied by the patient's mother using the described contacts while the clinician contacted the patient’s cranium. The clinician moved through the cranial bones using slight traction to spread each bone outwards from the cranial vault. The typical pattern followed occiput, parietal, temporal, sphenoid, and frontal bones. Cranial adjustments were often accompanied by the clinician and patient's mother singing in order to soothe the child.

The patient’s mother was also advised to administer infant probiotics daily to help manage the gastrointestinal symptoms.12

Outcomes

Within 2 visits muscle hypertonicity was significantly improved. After 2 months of care the patient’s PrevacidTM dosage was reduced by half. At this point the patient was also able to extend on her arms normally in the prone position. Additionally, her parents stopped swaddling during naps. The patient, while still exhibiting some separation anxiety, was able to be soothed rapidly by clinic staff. By 4 months of care the patient was no longer taking PrevacidTM and her parents had ceased swaddling at night. Constipation resolved concomitant with the patient starting solid foods around 9 months of age.

At the 6-month reassessment the patient continued to do well without anti-reflux medication, was regularly having 1 to 2 bowel movements per day and continued exhibiting normal reactions to non-parental adults though some separation anxiety persisted. At this time, spit ups occurred approximately once per week and consisted of 1 to 2 teaspoons of gastric content. Hypertonicity of the sternocleidomastoid, paraspinal and suboccipital musculature was resolved. Facial and extremity tone was equal bilaterally. The patient’s plagiocephaly was significantly improved, with only slight leveling of the occiput noted.

Discussion

Subluxation

The goal of chiropractic care is to detect and correct vertebral subluxations to allow proper neurological and physiological functioning and ultimately improve a patient’s quality of life. Location and correction of vertebral subluxation is the unique cornerstone which historically, legally, and politically defines chiropractic practice.13 There are many theoretical models in scientific literature to illustrate the vertebral subluxation; common to all of them is a kinesiological and neurological component.14, 15

Pathophysiology

Alterations of the autonomic nervous system in response to spinal afferent signals has been illustrated; in particular, sympathetic response to noxious stimulation exhibits a spinal segmental organization.16 Chiropractic adjustments of vertebral subluxations have been demonstrated to impact autonomic activity.17 In this case the patient exhibited signs of structural and neurological issues indicating vertebral subluxation and visceral dysfunction related to the gastrointestinal system. Autonomic dysfunction, including decreased vagal tone may lead to gastric dysmotility and dysfunction.18 Higher vagal activity is also associated with better social skills, joy and self-soothing.18 With this patient, initial extreme stress reactions to strangers could have been due to low vagal tone and autonomic dysfunction. In addition, autonomic dysfunction is correlated with impeded flow of cerebrospinal fluid around the spinal cord and within the cranium.19 In this example, vertebral subluxation could have contributed to the development of plagiocephaly not only by directly preventing full extension range of motion of the spine but also by stasis of cerebrospinal fluid in the cranium.

It is believed that restoration of proper kinesiological and neurological function by correcting vertebral subluxation re-established proper afferent stimulation of the autonomic nervous system. Concomitant with reduction of vertebral subluxation findings, the patient demonstrated an improvement of autonomic function including stress responses, improved gastric motility and resolution of gastric reflux symptoms.

Literature Review

Three other cases of childhood GERD with chiropractic management have appeared in the scientific literature.20-22 The first of these resulted in a referral for allopathic care after there was no resolution of abdominal symptoms after a few chiropractic adjustments.20 In the second case, a 3-month-old infant with GER was successfully managed with a combination of chiropractic adjustments and abdominal Kinesio Tape.21 Alcantara and Anderson described the care of a 3-month-old female with GERD whose symptoms were noticeably improved within 4 visits and completely resolved within 3 months of chiropractic management.22

There are also examples of constipation in the pediatric population that responded to chiropractic care.23-25 A recent paper described an infant with various gastrointestinal complaints including excessive crying, abdominal distention, constipation and gas which were managed successfully after 16 chiropractic visits.23 Horkey described the chiropractic care of a 6-year-old female with chronic constipation whose symptoms resolved after 13 visits.24 A case series described 3 patients under 2-years-old with chronic constipation who were successfully managed with chiropractic care.25

Chiropractic management of plagiocephaly also appears in the literature.26, 27 Quezada described the chiropractic care of a 7.5-month-old male with plagiocephaly which resulted in mild remodeling of the cranial vault and significant improvements in developmental milestones, behavioral patterns and facial symmetry.26 Interestingly, this case also presented with fussiness, facial asymmetry and a history of gastrointestinal dysfunction. Davies outlined the complete resolution of 25 cases of deformational plagiocephaly in infants who underwent chiropractic care.27 In addition, Leighton has proposed an evidence-based model of chiropractic management of non-synostotic deformational plagiocephaly.28

Limitations

Given that infant regurgitation typically resolves
spontaneously within the first 18 months of life,4 it is possible that GERD in this case resolved independent of chiropractic care. It has been reported that the majority of patients referred to a pediatric gastroenterology service for GERD did not meet strict criteria for GERD and did not require anti-reflux medications, though nearly half presented already on medication.26 Considering that this patient was not analyzed for intra-esophageal pH, it is possible that despite a clinical presentation consistent with GERD that this was not a true case.

Similarly, functional constipation in infants, when an organic cause has been ruled out, may be due to dietary issues or completely normal in an exclusively breastfed infant.6 Resolution of constipation in this patient may have been independent of chiropractic management.

Chiropractic Care of Children

The scientific validity of chiropractic management of the pediatric population has been called into question even within the chiropractic community.30 However, a recent study by Alcantara et al. described survey responses of chiropractors in a practice-based research network regarding 5,438 office visits from the treatment of 577 children and responses of parents of pediatric chiropractic patients regarding 1,735 visits across 239 children.31 With only 5 adverse events following a visit noted, all of which consisted of mild stiffness and soreness, this study demonstrated that chiropractic pediatric management is both highly safe and has a highly perceived level of efficacy.31

Conclusion

This report presents the successful chiropractic management of a 5-month-old female with complaints of GERD, constipation and deformational plagiocephaly. Restoring proper kinesiological and neurological function by correcting vertebral subluxation restored proper afferent stimulation of the autonomic nervous system. Concomitant with reduction of vertebral subluxation findings, the patient demonstrated an improvement of autonomic function including stress responses, improved gastric motility and resolution of gastric reflux symptoms. This case suggests that other patients with similar presentations may benefit from chiropractic care and more research in this area is warranted.

References


