Resolution of Erb-Duchenne Palsy in a 5-month-old Female Following Subluxation Based Chiropractic Care

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Abstract

Objective: To chronicle a case of infantile Erb’s-Duchenne Palsy that resolved during chiropractic care.

Clinical features: A 5-month-old girl medically diagnosed with right-sided Erb’s-Duchenne Palsy and previous physiotherapy presented for care. The infant’s right elbow on flexion/extension, pronation/supination and right shoulder abduction demonstrated decreased passive and active range of motion (ROM). Deep tendon reflexes in both upper extremities were within normal limits. During Moro and ATNR reflex testing, the involved arm did not move.

Intervention and outcome: The patient received care using Modified Diversified Technique characterised as a sustained contact “touch and hold” appropriate for the infant’s age. In addition, adjustments to the elbow were performed along with meningeal stretching. The infant’s clinical presentation resolved with postural improvements full ROM in the affected extremity within two months of initiating care.

Conclusion: This case report suggests that infants suffering from obstetrics palsy may benefit from chiropractic care.

Key Words: Erb-Duchenne Palsy, shoulder dystocia, birth trauma, vertebral subluxation, chiropractic, chiropractic adjustment

Introduction

Obstetrical paralysis was first described by Smellie in 1768.¹ Wilhelm Heinrich Erb (1840-1921), the "father of neurology" described the classic brachial plexus palsy involving the superior (or upper) roots of the brachial plexus that now bears his namesake.² Guillaume Duchenne de Boulogne (1806-1875), the "father of electrotherapy and electrodiagnosis"³ also contributed to this type of obstetrical paralysis and the arm type, Erb-Duchenne Palsy, also now bears his name. The paralysis results from forceful downward tractioning of the arm during delivery and results in damage to the C5-C7 nerve roots.⁴ The infant at birth presents with internal rotation and adduction of the shoulder with the elbow extended and the wrist flexed while hand function is preserved.

Recovery of the disorder is considered to be slow when there is disruption of the axons causing haemorrhage and edema within the nerve sheath. In many cases, patients recover with little in the way of remaining deficit but it is equally certain that in some cases, the patients do not recover.⁵ In a study of 20 infants, 30% recovered with minimal defects by six months of age, 55% had moderate residual deficits by 12 months and 15% had significant handicaps.⁶ The disorder is usually medically managed with physiotherapy and surgery may be required in complicated cases.

Parents turn to alternative therapies for their children due to chronic and recurrent conditions, concerns about the safety of medications and the risks associated with surgery or as an adjunct to medical care.⁷ Of the various practitioner-based alternative therapies, chiropractic continues to be popular and highly utilized by adults and their children.⁸ In this era of evidence-based practice, allopathic and alternative practitioners are continuously challenged to provide safe and

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effective interventions. Of interest in this report is the chiropractic care of infants with Erb-Duchenne Palsy. Our review of the literature indicates that the research evidence is lacking on chiropractic care of infants with Erb-Duchenne. To address this deficit and inform clinical practice, we describe the chiropractic care of an infant with Erb-Duchenne Palsy.

Case Narrative

A 5-month-old female with Erb-Duchenne Palsy was presented for possible consultation and possible care. The infant’s mother reported a difficult delivery at 40 weeks of gestation. She described her labor as lasting 12 hours, during which the head and shoulder of the child “got stuck.” The infant’s presentation was reported by the attending midwife as shoulder dystocia. Vacuum extraction was utilized during the delivery to overcome the presentation. Immediately following the delivery, the newborn showed diminished ranges of motion in her right arm. The infant measured normal length at 51 cm with weight at 8.0 kg. The midwife referred the newborn to a medical specialist, who confirmed a diagnosis of Erb’s-Duchenne Palsy and advised physiotherapy. Pronation/supination stretches and passive ranges of motion (ROM) was advised by the physiotherapist.

The infant’s initial examination demonstrated severely reduced active ROM of the right arm despite the regular stretches advised. The right elbow on flexion/extension and pronation/supination and her right shoulder on abduction demonstrated noticeably decreased ROM. All upper limb deep tendon reflexes were tested and were within normal limits. During Moro and ATNR reflex testing, the involved arm did not move.

On the first visit, L4, C1, and T2 subluxations were adjusted with Modified Diversified technique along with myofascial release of the soft tissue elements around the patient’s right radial head. Furthermore, a left lateral flexion meningeal stretch was performed on the patient. On the second visit, the assessment demonstrated a slight improvement in abduction of the right arm and only a left meningeal stretch was performed. During the third visit, the patient demonstrated overall improvement in passive ROM of the right arm. The patient’s improvement was confirmed by the physiotherapist as related by the infant’s parents. During this 3rd visit, the infant’s right radial head was adjusted along with the C1 subluxation. A meningeal stretch was also performed (bilaterally).

Similar vertebral subluxation patterns were found and adjusted on the fourth to sixth visits. On the 7th visit, the patient demonstrated considerable improvement in ROM and observed to actively reach for toys with her right arm. On the 8th visit one week from her last visit, the patient’s mother reported a fever of 37.9°C over the previous few days. The right elbow and C1 subluxations were adjusted. On the 9th visit, the patient showed no noticeable difference in the ROM between the right and left arm and was able to use both at will. Nine and half weeks passed since the patient’s initial consultation with full resolution of the symptoms in the right arm. The patient’s visits are summarized in Table 1. The infant’s parents consented to further care with schedules at one visit per month and cared for similarly as described.

Discussion

As in the case report described, shoulder dystocia with vacuum extraction is a prominent risk factor for OBPP in the newborn. Using a population-based retrospective design, Molberg et al. evaluated the risk factors for OBPP in 13,716 women delivered by vacuum extraction. These investigators found OBPP in 1.1% (N=153) of the infants. Shoulder dystocia, fetal birth weight of 3,999 g or greater and administration of fundal pressure were variables that significantly increased the risk of OBPP in the newborn. Additionally, the risk of OBPP in vacuum-assisted deliveries increased proportionately to the vacuum extraction time.

Chauhan et al. summarized 63 publications involving neonatal brachial plexuses palsy (NBPP) in the English language. Based on an estimated 17 million births and 24,000 NBPPs, the authors found that the rate of NBPP in the US and other countries was comparable with 1.5 vs. 1.3 per 1000 total births, respectively. Secondly, the rate of NBPP may be decreasing with 0.9, 1.0 and 0.5 per 1,000 births for publications before 1990, 1990-2000, and after 2000, respectively. Third, the likelihood of not having concomitant shoulder dystocia with NBPP was 76% overall, though it varied by whether the publication was from the US (78%) vs. other countries (47%). Fourth, the likelihood of NBPP being permanent (lasting at least 12 months) was 10-18% in the US-based reports and 19-23% in other countries. Fifth, in studies from the US, the rate of permanent NBPP is 1.1-2.2 per 10,000 births and 2.9-3.7 per 10,000 births in other nations. Sixth, approximately 5000 NBPPs occur every year in the US, of which over 580-1050 are permanent. Furthermore, since birth, 63,000 adults have been afflicted with persistent paresis of their brachial plexus. The epidemiological knowledge of the incidence, prevalence, and temporal changes of NBPP demonstrate the need to examine further care options to abate the long-term sequelae of this disorder.

Injury results from tractioning of the arm and concomitantly, tractioning of the brachial plexus. Three different types of injury are distinguishable. The mildest form of injury is neuropraxia (i.e., a nerve conduction is blocked) without actual physical damage to the nerve fibres) accompanied with slight demyelination. Nerve function is usually restored within several days or weeks. The next level of nerve injury is axonotmesis (i.e., axons are anatomically ruptured but the connective tissue sheath is not damaged). There is initial degeneration of the peripheral part of a nerve fibre but gradual regeneration soon ensues. Unfortunately, complete recovery of function may take months or years. In some patients, limb function remains permanently impaired. Finally, in neurotmesis, the nerves are completely ruptured. The nerve requires suturing or transplantation, and prognosis is uncertain. The most severe cases are those with involving avulsion of the spinal nerves.

Differential Diagnosis

Differential diagnosis for OBPP includes clavicular fracture, osteomyelitis and septic arthritis. Pseudoparalysis may result from clavicular fracture and could be mistaken as OBPP. In a review of 11,636 deliveries, Peleg et al. found 236 (2.03%) suffered from clavicular fracture while 51 (0.44%) had Erb's

the newborn usually assists the rotation. The occiput and the sacrum of the baby are and other parts of the body. This meningeal release technique which can often be a source of dysfunction in the neck, pelvis and other parts of the body. This meningeal release technique is performed amongst chiropractors by guiding the baby into three different motions: flexion/extension, lateral bending and rotation. The occiput and the sacrum of the baby are simultaneously supported and a gentle traction is applied in the direction of restriction. The newborn usually assists the motion, stretching the medulla in the spinal canal and thus the Meninges. Elbow flexion restoration was fundamental for the recovery of this infant and others afflicted similarly. In the case reported, specific chiropractic elbow adjustments were applied with the aim to restore full ROM of the joint.

In 2010, Alcantara described the chiropractic care of an 8-year-old female presenting with a “waiter’s tip” deformity since birth. The report was augment with a review of the literature on the care of infants with Erb’s palsy. The 8-year-old’s ROM in the upper extremities were restored and the muscle tonicity had normalized following three months of care involving chiropractic adjustments and myofascial release of the affected extremity.


We found one article. Gordon described the care of a 2-week-old male child presenting for care with incomplete obstetric palsy of the brachial plexus and facial nerve. Over a 4-month period, the infant received care involving chiropractic craniosacral technique and massage resulting in a gradual reduction in plagiocephaly and improvement in facial symmetry, upper limb posture, and movement.

Our review of the literature exposes the need to further describe the clinical experience of chiropractors in the care of similar patients. Documentation of our successes and failures in the care of such patients informs clinical practice and the design of higher-level research designs. Similar to previously published literature on the subject, infants with obstetrics palsy may benefit from the application of chiropractic adjustments to dysfunctional segments (i.e., subluxations) of the cervical and thoracic spine as well as the involved extremity. In addition, adjunctive therapies in the way of soft-tissue mobilization, massage or myofascial release may facilitate restoration of function.

In closing, we acknowledge the traditional caveats regarding case reports. From a post-positivist perspective, we caution the reader on the generalizability of case reports due to the presence of bias (i.e., lack of a control group, spontaneous remission, self-limiting course and natural history of the disorder, subjective validation, and expectations for clinical resolution on the part of the patient). However, from a constructivist point of view where experience shapes reality, the clinical experience shared in this case report and those of others provides us the knowledge to formulate care approaches in infants with obstetrics palsy and the affirmation that we may help them.

**Conclusion**

This case chronicles the care and subsequent resolution of Erb-Duchenne Palsy in a five-month-old female with chiropractic care. This case report suggests that chiropractic care may be benefit infants with Erb-Duchenne Palsy. We support further clinical documentation and in the care of similar patients.
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References

Table 1

<table>
<thead>
<tr>
<th>Visit Number</th>
<th>Clinical Observations</th>
<th>Adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Marked reduction in pro/supination on R</td>
<td>L4BL; T2SpL; Ant R Rad Head; C1R; L lat flex meningeal stretch</td>
</tr>
<tr>
<td>2</td>
<td>Had small ROM increase in abduction</td>
<td>L meningeal stretch</td>
</tr>
<tr>
<td>3</td>
<td>ROM increased – had physio checkup and was pleased</td>
<td>R ant radial head; meningeal stretch bilaterally; C1R</td>
</tr>
<tr>
<td>4</td>
<td>ROM continuing to improve</td>
<td>L4BL; R occ condyle; T6BL</td>
</tr>
<tr>
<td>5</td>
<td>Grumpy today</td>
<td>L4BL; C1R + condyle; R radial head</td>
</tr>
<tr>
<td>6</td>
<td>Almost complete ROM in R arm – abduction/sup/pronation</td>
<td>L4BL; C2BL; R condyle</td>
</tr>
<tr>
<td>7</td>
<td>Actively using arm to reach for toys</td>
<td>PLSac; R Occ condyle</td>
</tr>
<tr>
<td>8</td>
<td>Sick last few days – temp 37.9</td>
<td>C1R; R elbow</td>
</tr>
<tr>
<td>9</td>
<td>No noticeable difference between L and R arm ROM</td>
<td>L5BL; T6R; bilat condyle rock; meningeal stretch</td>
</tr>
<tr>
<td>10</td>
<td>Moved to fortnightly care</td>
<td>PLSac; T6R; condyles</td>
</tr>
<tr>
<td>11</td>
<td>Wellness check</td>
<td>PLSac; T6R; C2BL; condyles</td>
</tr>
<tr>
<td>12</td>
<td>Wellness check</td>
<td>C1R; condyle rock bilat; L5BL</td>
</tr>
<tr>
<td>13</td>
<td>Wellness check</td>
<td>C1R; condyles; PLSac</td>
</tr>
<tr>
<td>14</td>
<td>Stuffy nose</td>
<td>PLSac; C1R; condyles</td>
</tr>
<tr>
<td>15</td>
<td>Wellness check</td>
<td>PLSac; C1R; R Occ Condyle</td>
</tr>
</tbody>
</table>

Table 1. Summary of care provided to the patient described.