The importance of clinical examination and collaborative care in the successful chiropractic management of a 31-month-old boy with acquired torticollis: a case report

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ABSTRACT

Introduction: Acquired torticollis in children may present a diagnostic challenge as many different underlying causes are possible, ranging from benign mechanical concerns to serious and potentially life-threatening conditions. **Presenting concerns**: A 31-month old boy presented to a chiropractic clinic with acquired torticollis of possibly traumatic origin. Although it appeared to be a typical muscular torticollis, certain elements of the history and examination findings could point to more serious diagnoses. Thorough intake, physical examination, and interdisciplinary collaboration are paramount for practitioners to help rule out potentially serious conditions before initiating conservative care. **Interventions**: The initial chiropractic evaluation was performed over the course of one week, and included intraprofessional consultation with a pediatric chiropractor. Previous examinations had been performed at a pediatric hospital. Gentle soft tissue and cervical and pelvic joint mobilization, adapted to the patient's age and size, were performed for a total of six visits over a three-week period. **Outcomes**: Upon re-evaluation, complete resolution of the aforementioned symptoms was noted. The results were maintained at follow-up five weeks later. **Conclusion:** Pediatric chiropractic care proved beneficial for this young boy with acquired torticollis. Intraprofessional consultation and collaboration was helpful in the case and should be encouraged.

Keywords: torticollis, diagnosis, mobilization, child, conservative, chiropractic

Introduction

A number of cases describing the conservative treatment of congenital torticollis in children, including with chiropractic care, have been published throughout the years.[1-4] However, less has been published about acquired torticollis in children and even fewer publications are related to its conservative management.[5-10] Torticollis is a symptom that can be indicative of a wide range of pathology from benign muscular contractures to severe and possibly life-threatening conditions like tumors or central nervous system (CNS) disorders.[11-13]

Torticollis is a relatively common disorder, and although most cases are considered benign and appear to respond well to conservative therapy, a detailed clinical history and complete physical examination are necessary to rule out more serious etiologies before initiating care.[14-16] This report presents the case of a 31-month old boy who presented to a chiropractic clinic with acquired torticollis and illustrates the importance of a thorough evaluation as well as the benefits of intra and inter-professional collaboration and management.

Case presentation

Presenting history

A 31-month old boy of Hispanic origin presented to a chiropractic clinic with neck pain and torticollis, onset approximately 6 weeks prior. No pre-existing neck complaints or conditions were reported. Two weeks prior to the onset of neck pain and torticollis, the child was reported to have fallen while trying to climb a stroller, but the parents did not witness the incident and were therefore unable to describe or confirm it. Initially, the child complained of left knee and ankle pain and was limping. A few days later the torticollis appeared. A week after the incident, he was brought to a pediatric hospital where radiographs of the left knee and ankle were taken and diagnosed as normal. He was diagnosed with an ankle sprain and the parents were told to give ibuprofen for the pain and inflammation. The following week, the child was brought back to the hospital to interrogate the neck pain and torticollis. Blood tests and cervical radiographs were ordered. The radiographs were deemed normal, but the pediatrician noted "signs of inflammation" in the bloodwork and scheduled a cervical computed tomography (CT) scan. The parents were instructed to continue giving ibuprofen as needed. The CT was later cancelled by another pediatrician when additional blood tests revealed normal inflammatory markers.

One month following the hospital visit and 6 weeks after the fall, the child was brought to the chiropractic clinic with persistent limping and a torticollis in left lateral flexion and right rotation. The neck pain was reported more severe at night and the patient had recently begun hitting his forehead with his hands, was fatigued, lethargic and irritable.

Past history

The patient was a healthy 31-month old boy born by C-section. The APGAR score at birth and after 5 minutes was 9/10, he weighed 7.5 lbs and measured 23½" in length. He was diagnosed with deformational plagiocephaly as a baby and his mother reported difficulty breastfeeding at the left breast. Prior to the incident, he was an active boy who enjoyed playing soccer and had good appetite. He slept 7 to 8 hours per night, and was able to sleep in all positions without difficulty. No other health conditions had been diagnosed with the exception of hypersensitivity to mosquito bites (local swelling and itching). He had received the recommended vaccines on schedule, the last reported immunization was done at 18 months of age.

Past medical history

Review of systems revealed an upper respiratory tract infection in the past 6 months, which was treated with antibiotics. The parents mentioned that the symptoms seemed to last for weeks even after the antibiotics, but were fully resolved at the time of consultation.

The parents sought no intervention for the deformational plagiocephaly and breastfeeding difficulties. The pain and inflammation related to the left ankle and knee and neck concerns were treated with ibuprofen as advised by the medical doctor. No other treatments had been rendered. The family history was unremarkable.

Physical examination and significant findings

During the initial visit, only a partial examination was performed due to patient pain and cooperation. General observation revealed the head laterally flexed to the left with a right rotational component. Active range of motion revealed restricted motion in left rotation and flexion. Passive right lateral flexion was painful and passive left rotation induced left rotation of the entire trunk. Patellar reflexes were 3+ bilaterally. Soft tissue palpation revealed hypertonicity in the left sternocleidomastoid (SCM), upper trapezius and right suboccipital muscles. Multiple lymph nodes were palpable along the right posterior cervical lymphatic chain. Joint palpation revealed restrictions in the upper cervical (C0-C1-C2), mid-cervical (C4-C5), upper thoracic (T2-T3) and sacroiliac joints.

Further evaluation was completed during the following visits, and the child became more cooperative as neck mobility improved. After the initial examination, the chiropractor (MHN) decided to consult another chiropractor (DB), who was a more experienced pediatric chiropractor, in order to better prepare the remainder of the examination and to rule out more serious etiologies for torticollis. The clinical history questions, including a more detailed health history, a better description of symptoms and their evolution and more details about the prior hospital visits, were answered by phone between visits 2 and 3. According to the parents' recollection and photographs of the child at various ages, he did not appear to have a pre-existing torticollis. The chiropractor was able, at the third visit, to perform a partial cranial nerve evaluation (III, IV, VI, VII, XI). The child was no longer limping. The plantar reflexes were normal, and deep-tendon reflexes (DTR) were graded normal (2+) for upper and lower extremities (biceps, triceps, styloradial (brachioradial), patellar and Achilles), except for the right patellar DTR which was graded as slightly increased at 3+. The hospital radiological report, stating normal studies of the left lower extremity and cervical spine, was obtained at the fourth visit.

Diagnosis

A working diagnosis of muscular torticollis of biomechanical origin was made. The radiological examination performed at the hospital was unremarkable, no neurological signs or symptoms remained, and the cranial nerves that could be evaluated revealed normal function. There was a probable history of a minor trauma (fall), but the absence of an eyewitness made it impossible to ascertain whether the fall precipitated the neck injury. Cervical range of motion, both active and passive, was significantly reduced and painful, especially in left rotation and flexion. No fever was reported, but the child had been given ibuprofen since the incident, which could have masked the fever.

Most observations, at first glance, indicated a mechanical condition. However, the initial injury to the left knee and ankle, the acquired torticollis appearing within a week of that injury, the decreased in cervical range of motion, the presence of inflammatory markers with blood testing, the constitutional symptoms (fatigue, loss of appetite, loss of interest in usual activities, etc.), as well as the history of upper respiratory tract infection in the previous months could indicate signs of more serious types of acquired torticollis, such as inflammatory arthritides, central nervous system (CNS) disorders, or even infectious or neoplastic conditions.[9-13,16] Although less common, those conditions could not be ruled out completely on the basis of the examinations performed at the chiropractic clinic and the hospital.

Therapeutic intervention

At each visit, cervical active and passive ranges of motion were evaluated, and both joint and soft tissue palpation were performed in order to determine the treatment. After obtaining informed consent from the parents, the first treatment occurred during the first visit in order to relieve some of the symptoms and facilitate further evaluation. The treatment consisted of gentle soft tissue therapy (bilateral SCM and suboccipital muscles, right gluteal muscles) and gentle joint mobilization of the upper cervical area and left sacroiliac joint.

For all visits, soft tissue therapy consisted of light circular massage or pressure points on the affected muscles. Cervical mobilizations involved non-thrust, sustained contacts on cervical structures while positioning the neck in the direction of required correction (either lateral flexion with a skin contact taken over the lateral aspect of the vertebrae or a combination of lateral flexion and slight rotation to the opposite side with a contact near the zygapophyseal joint). Gentle traction or repeated low amplitude passive movements were added in accordance with the child's tolerance and cooperation. The most commonly treated segments were C1-C2 and C4-C5. Pelvic mobilization involved light pressure on the sacrum or ilium, depending on the mobility restriction evaluated by joint palpation.

Follow-up and outcomes

Table 1 describes the child's visits to the chiropractic clinic as well as parent-reported outcomes. The child was seen a total of six times over a three-week period and demonstrated complete resolution of the symptoms. At the seventh visit, two weeks later, the results were maintained and the child was discharged. The parents were instructed to return for follow up in three months or as needed. The child underwent a total of six visits in a three-week period with a good clinical outcome, which was maintained at the follow-up appointment two weeks later (and a follow-up phone call 3 weeks later confirmed results were still maintained). No adverse effects were observed by the chiropractor or reported by the parents.

Table 1. Follow up and outcomes

DATE	TREATMENT	OUTCOME AT NEXT VISIT :
July 21	Initial consultation Partial examination is performed. Treatment #1 STT (suboccipitals, SCM, gluteals) MOB (upper cervical and pelvis)	Subjective increase of 25% left LF Passive F + right LF possible Child able to lie supine Passive left ROT induces body ROT Child slightly more cooperative
July 22	Visit #2. Examination is continued. Treatment #2 STT (suboccipitals, SCM) MOB (upper cervical and pelvis) Advice to stimulate left ROT	Reported improved sleeping Reported less irritability No need for ibuprofen Head almost in neutral position Reduced tension in left trapeze and SCM upon palpation Fewer palpable lymph nodes Passive left ROT 60°, no body ROT
July 28	Visit #3. Examination is continued. Treatment #3 STT (suboccipitals, SCM) MOB (upper cervical, pelvis)	No visible torticollis Active left ROT 45°, passive 65° Child no longer complaining of pain
Aug. 1	Visit #4. Treatment #4 STT (suboccipitals, SCM) MOB (upper cervical)	No pain complaint since last visit Reported improved sleep and increased activity Active left ROT 60°, passive 75°
Aug. 4	Visit #5. Treatment #5 STT (suboccipitals, SCM) MOB (upper cervical)	No pain complaint since last visit Reported resumed playing sports Active neck movements are normal
Aug. 11	Visit #6. Treatment #6 STT (suboccipitals) MOB (upper cervical)	No pain complaint since last visit Reported resumed playing sports Active neck movements are normal
Aug, 25	Visit #7. No treatment. Patient is discharged with advice of consulting on an as-needed basis or follow-up in 3 months time.	

LF : lateral flexion F: flexion ROT: rotation
STT: soft tissue therapy MOB: mobilization

Discussion

Torticollis is a relatively common pediatric condition and the majority of cases are benign in origin.[16] The most common type of torticollis seen in children is congenital muscular torticollis, with a reported incidence ranging from 0.3 to 2%.[11-12,15,17] Congenital muscular torticollis is typically associated with intrauterine constraint and/or birth trauma, and usually appears within the first month of life, although it may become more apparent in the early childhood years.[11-12] Most cases either self-resolve within the first year of life or with conservative treatments consisting of various manual therapy approaches including stretching, postural exercises, massage and postural advice. Some cases may require surgical intervention.[11]

Contrary to congenital muscular torticollis, acquired torticollis in children can be associated with a myriad of causes.[7,9-12,14] Among those etiologies, the most common are traumatic, infectious, or CNS-related disorders.[7,11-12,14,18] Other causes include congenital malformations of the craniocervical structures, as well as tumoral and inflammatory conditions.[11-12] It is important to consider these etiologies when evaluating a child with acquired torticollis.

A literature search was done through PubMed to retrieve recent publications on this topic, using the key words torticollis, pseudotumor, dystonia, chiropractic, spinal manipulation, physical therapy, children, congenital, acquired. Papers were selected based on date of publication (2000-2015) and language (French and English), as well as the relevance to conservative care. The search was also widened to related articles and cited references. The literature supports the fact that any acquired torticollis in a child should be considered as traumatic when initially evaluated, as even minor trauma has been reported to induce torticollis.[11,14,19] The cervical spine of children reacts differently to the deformational forces in acceleration/deceleration injuries.[20] This is explained by the increased head to body ratio, the relative ligamentous laxity, the weaker neck muscles as well as the more horizontal orientation of cervical facet joints.[7,17,19-22] This may also increase the risk for traumatic onset atlantoaxial rotatory fixation (AARF) in children.[7,19-20,22] It is also important to understand that the absence of a history of trauma does not always rule out a traumatic origin, as children may have difficulty reporting or describing falls or other injuries.[14,16] Therefore, in the presented case, a traumatic onset should be considered.

Another form of AARF has been reported in the literature and is known as Grisel syndrome, a non-traumatic type of AARF of inflammatory origin, which is closely related to a history of ears-nose-throat (ENT) surgical interventions or infections prior to the development of torticollis. A differential diagnosis of Grisel syndrome, or inflammatory AARF, should be included in all cases of non-traumatic torticollis following an ENT or respiratory infection or a surgical intervention in the head and neck areas, as was the case with the patient presented here.[7,10-11,17,21] Although the precise pathophysiology of Grisel syndrome is not completely understood, it is hypothesized that a hyperemic reaction due to local inflammatory changes following the infection or intervention could cause decalcification near the insertion sites of upper cervical spine ligaments. This, combined with relative ligamentous laxity in children, would predispose for subluxation of the C1-C2 complex. In order to compensate for that instability, contracture of the paravertebral muscles could induce the torticollis.[7,11,14,16-17, 21-22]

The clinical presentation of AARF, whether traumatic or inflammatory in origin, differs from the typical muscular torticollis. While muscular torticollis often presents as ipsilateral lateral flexion and contralateral rotation of the neck, AARF patients present with ipsilateral rotation of the neck (the chin points to the side of the involved SCM muscle).[7,11,21] Inability to rotate the head past midline has been reported to be a pathognomonic sign for this condition.[17,21] Patients presenting with AARF may also have fever or other non-specific symptoms, but do not typically have neurological signs or symptoms.[14-15,17,19,21] Some cases report increased sedimentation rate and leukocyte count.[7,21] In the present case, although there were reported inflammatory markers in the blood tests, the head position was not typical of AARF.

In order to rule out congenital malformations and pathological and structural conditions, imaging studies are usually recommended in all children presenting with torticollis. In cases of traumatic onset, radiological evaluation of the cervical spine is the usual initial evaluation, which may be followed by magnetic resonance imaging (MRI) or CT studies.[18] Special consideration should be given to the atlantoaxial alignment, as well as to proper positioning considering the patient's postural asymmetry.[16,18, 20-21] According to certain authors, in the event of acquired torticollis in children in the absence of trauma, the initial recommended imaging evaluation should be MRI or CT studies.[18-19] However, other studies mention that CT studies, even though more sensitive, are not warranted in the absence of other suggestive symptoms, as they involve significant radiation exposure.[20] Such symptoms would include neurological deficits, altered mental status, torticollis, and neck pain.[20] In the present case, although a CT study was planned at one point, it was cancelled, reportedly following blood tests that had returned to normal values. However, according to the literature, in this case there was justifiable rationale to perform further diagnostic imaging studies.

Prior to any imaging studies, a complete physical examination and clinical history should be performed. Clinical history should emphasize history of trauma (even minor), history of previous respiratory, or ENT infection or intervention, presence of fever and other non-specific symptoms, presence or absence of pain, review of systems including eyes, head, neck, throat, lungs, and neurological symptoms. Physical examination should include observation and postural evaluation of the entire spine, evaluation of passive and active cervical range of motion, evaluation of cranial nerve function and other neurologic structures, as well as gentle joint and soft tissue palpation.[12,14,16] Unresolved acquired torticollis lasting more than 7 to 10 days and recurrent episodes of torticollis should be investigated with advanced imaging, as torticollis may be the only presenting symptom of serious conditions such as acute disseminated encephalomyelitis, posterior fossa or spinal cord tumors, AARF, and other disorders of the CNS.[7,9,14,16] Such conditions could explain the absence of positive outcome after several attempts of conservative management of torticollis, and also cause detrimental delays in proper diagnosis and intervention. One of the major predictive factors of poor prognosis in many cases of acquired torticollis, such as AARF and CNS disorders, is the time interval between the onset of symptoms and the formal diagnosis.[9,17]

In the present case, there may have been traumatic origin, although there were no eye witnesses to the fall. There were also possible risk factors for AARF, both of traumatic origin (from the fall) or inflammatory origin (previous respiratory infection and antibiotic use, lymphadenopathy, reports of "inflammation signs" in blood tests, unresolved torticollis one month after onset, inability to rotate head past midline). However, the head position was more typical of a muscular torticollis. The main limitation in reporting this case was the difficulty to obtain information from the medical file (blood tests, radiological images, other evaluations). Considering the positive outcome and maintained results, it is likely the child suffered from a typical muscular torticollis, which responded well to conservative treatments. However, it was not possible, based on the available information, to rule out other serious conditions. In the absence of a conclusive diagnosis, any treatment should be initiated gently and with great caution and constant attention to the evolution of the condition. Reported successful conservative management of pediatric torticollis in chiropractic and physical therapy typically include passive mobilizations and stretching exercises, as well as the use of spinal manipulation, especially by chiropractors.[1-4] Intra-professional collaboration with a practitioner more familiar with pediatric examination and management improved the quality of care in this case, and was likely instrumental in the positive outcomes. However, it proved difficult for the chiropractor to obtain the results from the medical examinations, which would have facilitated optimal decision-making.

Conclusion

Neck conditions are the second leading reason for patients seeking chiropractic care in Canada and the United States.[23] It is therefore probable that a parent may seek chiropractic care for a child who develops a torticollis. Although manual therapy offered by chiropractors and other health professionals has been shown beneficial in some cases of torticollis, especially the congenital muscular variation, awareness about other types of torticollis is necessary to ensure appropriate management for all patients. In order to ensure that a thorough examination and clinical history are performed prior to initiating treatment, practitioners who are not practiced at performing pediatric evaluations are encouraged to seek advice from colleagues with more expertise with the pediatric population. Although conservative care of pediatric torticollis appears to be effective based on the available publications, more extensive research on a larger scale and with higher methodological quality would be warranted to better document the type of care offered and the outcomes. Finally, it should be expected that clinical information readily be shared between healthcare professionals, as collabo-

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