

Management of Coxalgia with Shock Waves in an Adolescent with Spastic Cerebral Palsy

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Abstract

Introduction: In Cerebral Palsy (CP) there is a muscle imbalance that over time affects each of the joints involved and, according to the interventions and ontological factors, the impact will be seen from development to function. Hip displacement is directly related to gross motor function determined by the Gross Motor Function Classification System (SCFMG) and can cause pain that is often difficult to control. Treatment for hip dislocation coxalgia in CP is diverse.

Case Presentation: Here we present the case of an adolescent with coxalgia in which the family rejected the surgical option and after the scarce response to the physiatric and pharmacological management with negative impact on the quality of life and on the burden to the primary caregiver, we opted for drive with radial shock waves.

Discussion: The response to this management was remarkable with remission of the picture during its surveillance at 6 months.

Cerebral palsy (CP) gives muscular imbalance affecting as time goes on each one of articulations; according to ontological the impact will be at developmental and function. Hip displacement is in direct relation with gross motor function delimited by the Gross Motor System Scale and can gives pain, in the most cases difficult to control. Treatment for hip pain secondary to PC is diverse. We present the case of an adolescent with hip pain who his family reject surgical option and, after lacked response to physiatric and pharmacologic methods plus negative impact in the quality of life and charge to caregiver, was treated with radial shockwave. The response was noticeable with remission during surveillance by 6 months.

Keywords: Parálisis Cerebral; Luxación De Cadera; Coxalgia; Ondas De Choque; Cerebral Palsy; Hip Dislocation; Painful Hip; Shock

Introduction

In Cerebral Palsy (CP) there is a muscular imbalance that over time affects each of the joints involved and, according to the interventions and ontological factors, the impact will be seen from development to function. In children with CP hip displacement is the most common musculoskeletal deformity after equine foot and

is directly related to gross motor function determined by the Gross Motor Function Classification System (SCFMG).

Chronic increase in muscle tone, muscle imbalance and the development of fixed contractures around the hip joint along with an unbalanced posture contributes to the progressive displacement of the femoral head out of the acetabulum. Some patients with non-

ambulatory spastic CP and with deficient anti-gravitational postural control present with displacements of the femoral head and secondary pain; the directions of postural deformities in them [1] and the migration of the femoral head is directly related to age (the type of alteration in tone muscle has no significant relationship) [2]. The prevalence of hip dislocation is 10-15% while the displacement in several degrees is estimated at 25-60% and is higher in care centers with usual care without follow-up than in those that provide long-term surveillance and follow-up programs in the hip [3]. In clinical practice we observe that -generally- hip dislocation in CP is accompanied in the long term by the presence of secondary pain, statistical data for the incidence and prevalence of this are low: Hodgkinson, *et al.* [4] in a study multicenter found that 47.3% of them presented hip pain being more common at ages below 30 years and, in one in eight of them the pain disturbed their daily life; that the most frequent pain is that caused (58.2%) -evoked by mobilization, palpation and pressure with weight on the lower extremity; before surprising mobilizations, during physiotherapy and before the use of some attachments-; In addition, 19.2% of patients experience pain when they remain in the same position for a long time.

The Australian clinical practice guideline suggests that in children with skeletal immaturity and SCFMG V level, regardless of their orthopedic context, semi-annual surveillance is required until they reach bone maturity and that this frequency should be higher before the presence of increased spasticity, impaired tolerance to sedation, presence of spinal deformity, increased difficulty in hygiene, onset or increase of hip pain, pain of unknown origin and; when the pain is related to the hip should be referred to the orthopedic surgeon.

The treatment for coxalgia due to displacement of the femoral head in CP is diverse ranging from surgical management for some as a first choice to drugs, positioning, aligning attachments and physical therapy. Among the various physical means are radial shock waves that consist of a sharp increase in tissue pressure, which at different doses can be used for analgesia, dissolution of calcifications, biological therapy, among others.

Here we present the case of an adolescent with coxalgia in which the family rejected the surgical option and after its poor response to the physiatric and pharmacological management with a nega-

tive impact on the quality of life and the burden on the primary caregiver, it was decided to manage with radial shock waves. He was the Doctor at.

Rehabilitation in charge of the rehabilitation process of this child who carried out the evaluations mentioned here and followed up on the case.

Presentation of the case

This is a male patient of 12 years 3 months of age upon admission to the Institution, with a diagnosis of spastic quadriplegia secondary to perinatal asphyxia, with SFMG V, dislocated hips and secondary bilateral coxalgia, 30-degree dorsolumbar right scoliosis, dysphagia, severe limitation of higher mental functions, chronic controlled functional constipation, controlled epilepsy, dysgenesis of expressive language. We present the evolution in chronological order; pain was measured according to the FLACC scale (Graph 1).

Graph 1: Changes on adolescent painful spastic hip-measured with FLACC scale- after interventions.

Admission

Intermittent bilateral coxalgia of varying intensity, FLACC scale score 5. Pediatric Orthopedics suggests surgical management of soft tissues and the family rejects this option. The family is educated about positioning, home program with mobilizations, goes to physical therapy, its evolution remains stable for a year.

Month 12

Presented severe coxalgia with FLACC score 7, being managed with nonsteroidal anti-inflammatory analgesics (NSAIDs) and physical media.

Month 14

The response was minimal with a decrease of one point on the FLACC scale. Intense spasm was found in the muscles of both hips and painful points of predominance bilateral femoral head; Botulinum toxin type A (TbA) was applied. As a result observed at one month, care was facilitated and pain decreased to 4 POINTS of FLACC scale. Continue with physical media and NSAIDs.

Month 20

Their evolution during follow-up appointments was with minimal changes, same FLACC scale score; the family said tired and desperate not to make it remission of pain and with negative impact on adherence to the home program. He refused surgical management.

Month 24

Exacerbation of coxalgia finding an increase to 7 FLACC scale points; in the physical examination with significant spasm and spasticity of flexor and adductor muscles of both hips so That TbA was reapplied and received block of hydrotherapy, thermotherapy, electrotherapy and mechanotherapy as well as modifications to the attachments for positioning and hygiene postural. At his follow-up appointment per month he scored 4 on the FLACC scale and the left-sided spasm was eliminated.

Month 30

Reapply of TbA. The mother reported it calm except when she notices that her lower limbs will be manipulated (SCORE on FLACC scale 3). No pain during the physical examination even when it was moved abruptly. Continuous physical therapy blocks.

Month 34

The mother reports intense coxalgia when flexing left hip that makes passive sitting and care impossible, score of 9 on flacc scale. Non-restorative sleep of the family and the subject; thoughts of death in primary caregiver.

Physical examination with discrete spasticity in the hips, significant pain from the beginning of the mobilization of the same and multiple points of pain. Because despite having been approached

with different therapeutic modalities its evolution was insidious, it was decided to apply radial shock waves. The primary caregiver from the entrance to the Institution was with psychological accompaniment and this time it was intensified. The family signed Informed Consent, taking an X-ray before and after the intervention to rule out neoplasms or other local entities that could be affected by this therapeutic modality. The Doctor in Rehabilitation (previously trained for the application of therapy with radial shock waves) applied 3 sessions in total with an interval of 5 days being dosed according to the results between each of them as follows

- **Session 1:** Left hip sweeping technique rear face, 2000 shots, 1.5 Bar. He was restless at 1.5 Bar first, then relaxed. During the session there were no setbacks or side effects.
- **Session 2:** Uneasy at the initial positioning, sweeping technique on the back of the greater trochanter, 4000 shots 1.5 Bar. The application concluded with mild erythema of the area, without a point of pain, tolerating without discomfort the complete mobilization of the left hip and knee.
- **Session 3:** Calm before the positioning, pain to the palpation of the anterior face of the hip and in origin of the anterior rectum of the quadriceps. Sweeping technique, 3 000 shots 2.0 Bar to coxofemoral joint and 1000 shots 1.5 Bar, continuous mode to origin of anterior rectum of quadriceps. The application concluded with mild erythema of both areas, without pain point, tolerating without discomfort the complete mobilization in flexion of the left hip and knee.

Month 35

Reported by the mother with a decrease in pain by 80%, the sleep of the monophasic family, the parents rested more and could mobilize it with tranquility, happy primary caregiver reported with improvement by Psychology. In this period he did not receive management with physical means only home program based on positions and mobilizations. 2-point FLACC scale. Upon physical examination without painful points, the mobilizations are completed with the patient calm and smiling.

Month 36

Reported with 100% remitted pain. Score on FLACC scale 0. To the quiet physical examination without changes in the previous spasticity. Pelvic X-rays before and after application unchanged.

Month 40

Asymptomatic. Score on FLACC scale 0.

Discussion

Treatment for hip dislocation in CP is expensive and versatile, the decision of the therapeutic option is defined by factors such as the degree of displacement of the femoral head, the age of the patient, the presence of pain, spasticity and dystonia, limitations in the arches of mobility, among others.

The appearance of pain in the spastic hip is an indicator of the need for increased surveillance, follow-up and evaluations to the individual and referral to the orthopedic surgeon because surgical management is currently one of the most used for this condition and covers different techniques: the approach to soft tissues has a preventive and/or palliative objective ; from the Admission of the subject presented here the need for surgery was detected being rejected by the parents, then he was treated with different options seeking to control the pain.

The management offered included positions, postural changes and mobilizations. Positions and postural changes are indicated when the pain is secondary to maintaining the same posture especially when the patient is unable to express himself clearly. The physical means were applied with the aim of achieving relaxation and analgesia of the underlying tissues by combining up to four modalities together in the same day as well as NSAIDs without achieving control or remission of pain.

It is important to remember that CP is a dynamic disorder, with changes in the body over time influenced by the factors of the subject who suffers from it as well as strongly by the environmental, in this case the family served as a total facilitator for adherence to treatment, care and quality of life which helped to closely monitor and evaluate each of our interventions.

When muscle spasm secondary to spasticity was detected in hip muscle groups, we applied TbA having significant improvement on only one side, with insidious evolution despite three applications of the drug adhering to international recommendations, contrary to what was reported by Lundy, *et al.* [5] who studied the modification of coxalgia after the application of TbA in a group of 42 children with functional level according to the Gross Motor Scale in grade V achieving pain remission in 92 to 95% of cases with persistence of response at three months of follow-up.

Despite interventions and close follow-up, hip pain persisted negatively impacting the quality of life of the subject and family; In

order to facilitate the well-being of the patient and his family, databases were reviewed where among the management alternatives for pain of orthopedic origin in other conditions are shock waves [6-9].

The choice of management with radial shock waves in conditions with low scientific evidence should be based on the little or no effectiveness of the therapeutic options used on a regular basis and discarding local and/or bone alterations before their application and be carried out by trained personnel (in this case it was the doctor in Rehabilitation). The dosage and application was made based on the clinical context of the patient with close monitoring of their evolution and side effects looking for analgesia in the first sessions and, having referred the hip pain the last session was dosed looking for analgesia in antagonist muscles to try to achieve better muscle balance and a cellular effect at the level of coxofemoral joint because before the chronic disuse of the joint there is in addition to the risk of displacement, the wear of the articular surfaces. The follow-up to six months showed the remission and control of painful picture as well as the improvement in the quality of life of the subject and the decrease in the burden to the primary Caregiver and the family.

Conclusion

We were able to conclude that the shock waves in this case were useful for the management of spastic painful hips that are difficult to manage conservatively and refractory to treatment. The application of the same must be done by the doctor trained for it (recommendation of the Presidency of the Ibero-American Federation of Societies and Associations of Shock Waves in Medicine, ONLAT, October 2013) and according to the established standards, however the field of application is so wide that the Research line is open to continue its study in different populations.

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