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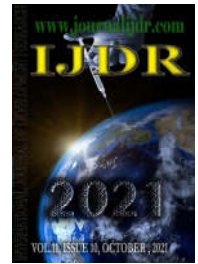
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RESEARCH ARTICLE

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APPLICATION OF DIFFERENT THERAPIES IN LIP INJURY IN A PATIENT WITH CEREBRAL PALSY: A CASE REPORT

Jenifer Diana Souza da Fonseca¹, Luana Campos¹, Fabiana Martins¹, Alessandra Reyes², Priscila Galzo Marafon Moda², Florence Mistro Zumbaio², Wilson Roberto Sendyk¹ and Marcia Hiromi Tanaka^{12,*}

¹Department of Post-graduation in Implantology, University of Santo Amaro, São Paulo, Brazil

²Department of Special Needs Patients, School of Dentistry, University of Araras, Araras, Brazil

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*Corresponding author:

Marcia Hiromi Tanaka

ABSTRACT

Background: Cerebral Palsy (CP) is related to non-progressive disorders that occur during fetal development or immature brain. Individuals with spastic CP have abnormal muscle tone causes involuntary movement disorder, pathological reflexes, and development of parafunctional habits. Purpose: This case report describe different therapies to treat a lip injury caused by emotional distress in a patient with spastic CP. First, the custom-made acrylic resin-based mouthguard was used for 2 months and to improve the healing process, the photobiomodulation therapy (PBMT) was used with the association of a chamomile-based ointment and the oral hygiene instruction with 0.12% chlorhexidine. After 1 month of follow up, the botulinum toxin type A (BoNT-A) was applied to decrease the higher spasticity of the lower lip. Discussion: Thus, the use of mouthguard, associated with PBMT and the application of BoNT-A was an effective set for lip injury due to occlusal trauma in patient with spastic CP.

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INTRODUCTION

Cerebral Palsy (CP) is related to non-progressive disorders that occur during fetal development or immature brain (Rosenbaum, 2017; Rosenbaum *et al.*, 2007). The etiology can be congenital, genetic, inflammatory, infectious, anoxic, traumatic, and metabolic (Rosenbaum, 2017; Sadowska *et al.*, 2020). Low birth weight and prematurity significantly increase the possibility of a child developing CP (Linsell *et al.*, 2016). Patients with CP require multidisciplinary treatment, as this is a group present several manifestations of the compromised brain, e.g., sensory loss, intellectual disability, epilepsy, musculoskeletal dysfunction, and many others may be more prominent in different periods of life (Gulati and Sondhi, 2018). Motor impairments in children eventually diagnosed with CP begin to manifest very early in development, usually before 18 months of age and the condition could be affect muscle tone, movement and motor skills (Gulati and Sondhi, 2018; Rosenbaum, 2017; Sadowska *et al.*, 2020).

CP can be classified considering the most prevalent of the motor disorder and classified as spastic (70%- 80% of cases), dyskinetic (10%-15% of cases), ataxic (approximately 5% of cases), and mixed (Gulati and Sondhi, 2018; Trompetto *et al.*, 2014). The limitations of motor functions in CP are often accompanied by disturbances in sensation, perception, cognition, communication, behavior, epilepsy, and secondary musculoskeletal problems, being the most common cause of physical incapacitation in childhood (Gulati and Sondhi, 2018; Sadowska *et al.*, 2020). Abnormal muscle tone causes involuntary movement disorder and is most often related to the underlying pathophysiology of the CP condition (Gulati and Sondhi, 2018). Individuals with spastic CP have marked muscle tone, pathological reflexes, and hyperreflexia or signs dyskinetic individuals present involuntary, uncontrolled, recurrent, and stereotyped movements and that could affect oral health due to difficulties in chew, swallow, access to perform adequate oral hygiene and the development of parafunctional habits, like self-injurious behavior (Letieri *et al.*, 2021; Santos *et al.*, 2008).

The aim of this study was to assess different approaches to the lower lip injury due to occlusal trauma in a patient with spastic CP.

CASE REPORT

A 21-year-old male, white, diagnosed with spastic CP, was referred to the dental clinical for patients with special needs in the University of Araras. After intra-oral physical examination (Ethics Committee #19737319.6.0000.5385), an ulcerated lesion was observed in the lower lip with hyperkeratotic edges and significant tissue loss (Figure 1A) due to occlusal trauma. The custom-made acrylic resin-based mouthguard was cemented with glass-ionomer (Figure 1B). To improve the healing process, it was applied the photobiomodulation therapy (PBMT) at 660-nm (Therapy EC; DMC[®], São Carlos, SP, Brazil) on contact mode, with 100 mW, 1 J, and 10 seconds per point. A total of 4 points were distributed throughout the region of traumatic injury with the association of a chamomile-based ointment (AdMuc, BioLab Sanus Farmacêutica LTDA, São Paulo, Brazil) and the oral hygiene instruction with 0.12% chlorhexidine. After 1 month of follow up, the botulinum toxin type A (BoNT-A) was applied to decrease the higher spasticity of the lower lip. The BoNT-A was applied in four points at a 1.25 units per point, two points of the depressor muscles of the lip and two stitches submentonian muscles. After one week, the patient didn't relate any pain or injury in the lip. Two weeks after the procedure, the lip injury had already healed, and the mouthguard was removed (Figure 1C). After five months of the follow up without pain or any injury, the patient presented other lip injury in the lower labial mucosa (Figure 1D), but this is expected since the action of the BoNT-A is 3 to 6 months.

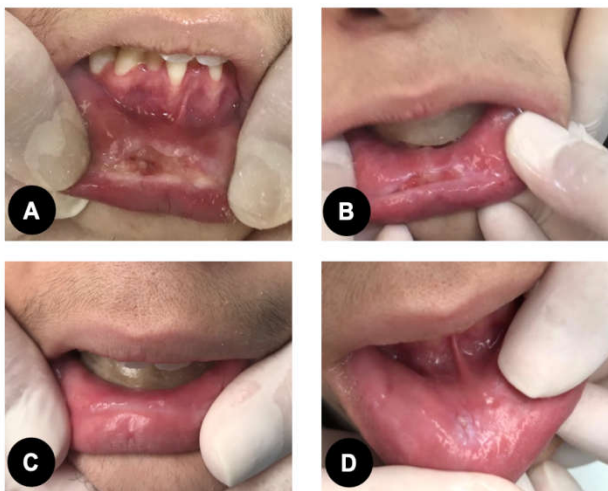


Figure 1. Clinical evaluation of the traumatic ulcer in the lower lip (a) initial; (b) 2 weeks of the follow up with the mouthguard and the laser therapy; (c) 2 weeks after the botulinum toxin and (d) five months of the follow up

DISCUSSION

CP is the most common origin of physical incapacitation in childhood, with an estimated prevalence in children between 3 and 10 years of age 2.7/1000 (Gulati and Sondhi, 2018; Halpern *et al.*, 2013). The frequent congenital or acquired disorder in the CP is the spastic type, this disorder characterized by an increase in speed that dependent on tonic stretching reflexes with exaggerated tendon spasms, resulting from stretch reflex (Mukherjee and Chakravarty, 2010). The spasticity could cause resistance to voluntary muscle control and triggering contractions of the body causing hypertonia and limiting the opening range of the oral cavity (Mukherjee and Chakravarty, 2010; Santos *et al.*, 2008). This neuromuscular disorder and the interposition of soft tissues between the dental arcades, could cause an occlusal trauma from an accidental bite during chewing, conversation or sleep and even poorly positioned teeth (Moreira *et al.*, 2004).

Several conditions need to be evaluated for the selection of the ideal approach in patients with self-injurious behavior considering the level of understanding, age, feeding capacity, and the degree of spasticity ranging from mild muscle stiffness to severe and painful uncontrollable spasms (Letieri *et al.*, 2021; Santos *et al.*, 2008). Patients with CP perform uncontrolled movements of the skull and neck due to involuntary muscle contractions involuntary muscle and increase the risk of lip injury due to occlusal trauma. The early intervention of the speech therapist is an important protective factor for the lip sealing acts (Moreira *et al.*, 2004). However, sometimes in the spastic CP, this uncontrolled movements can cause the self-injurious behavior (Santos *et al.*, 2008), specially associated with emotional conflicts, like in this case report that the patient was unable to go to school. The lip injury due to occlusal trauma caused by self-injurious behavior can be treated with different approach and the result can be improve with association of therapies (Letieri *et al.*, 2021; Moreira *et al.*, 2004; Santos *et al.*, 2008). The mouthguard designed to prevent occlusal trauma aims to divert the tissues without preventing movements from occurring maxillomandibular, and allowing adequate daily oral hygiene, to promote the healing of injured tissues, and can be easily manufactured, be comfortable, and do not present risk to the patient (Kumar and Bhojraj, 2011; Santos *et al.*, 2008; Yasui *et al.*, 2004).

To accelerate the healing process, the PBMT can be use as biostimulation which provides inflammatory responses with reduced edema, pain and cell biostimulation (Moreira *et al.*, 2004; Santos *et al.*, 2017, 2016). Although, one of the main characteristics of spastic CP is muscle hyperactivity which impact in the reappearance of lip injury. In other to assess the impact of local reduction of muscle hyperactivity is through the therapy with BoNT-A by weakening the selected muscles (Mall *et al.*, 1997; Sättilä, 2020). Despite the high cost, the neuro-blocker may be the first choice for the treatment of patients with self-harming behavior because the substance is well tolerated by the body, besides being safe and effective, allowing the improvement of muscle spasticity (Santos *et al.*, 2008; Sättilä, 2020). Thus, the use of mouth guard, associated with low-power laser therapy and the application of BoNT-A was an effective set for lip injury due to occlusal trauma in patient with spastic CP. So, the therapy association are very important to enhance the healing process, diminishing secondary contamination, achieving analgesia, minimizing the spasticity, and preventing recurrent traumatic ulcer to show the important to health professional to how to treat this ulcer in the spastic CP.

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