

Dental care for cerebral palsy patients using auxiliary resources to inhibit pathological tonic reflexes

Atendimento odontológico para pacientes com paralisia cerebral utilizando recursos auxiliares para inibir reflexos tônicos patológicos

Cuidado dental para pacientes con parálisis cerebral utilizando medios auxiliares para inibir los reflejos tónicos patológicos

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Cerebral paralysis is a chronic illness that affects the central nervous system. In this article the author describes the techniques used at CAOE (Odontological Center for Assistance to patients with special needs) to restraint CP patients during dental treatment, because they present some pathological reflexes which interfere in their odontological assistance. Also it shows how to perform a special physical restraint and how to keep the mouth open by using simple tools including a homemade one. All the devices used during the dental treatment in cerebral palsy patients, such as the physical restraint with bands or sheet to wrap them up, cylindrical pad or cushion made of a soft material, or simple tools including a homemade one to keep the mouth open are usually and safely used in CAOE. All these simple devices are necessary, because there are no available funds for the acquisition of expensive material or equipment. Despite of a shortage of resources we can easily and efficiently assist these patients.

Keywords: Cerebral Palsy; Patient Care; Restraint, Physical; Reflex.

INTRODUCTION

Cerebral palsy is the name given to a condition which affects the way the brain controls the muscles of the body resulting in difficulties of movement and posture. It has different causes, and affects each person differently, therefore people with cerebral palsy have different individual needs.

This pathological condition is the most common physical disability in childhood. It is estimated that two to three people out of every 1000 will have cerebral palsy. The condition is not hereditary and there is no cure. Many causes of cerebral palsy are still not known or understood.

Injury or changes to the developing brain are associated with cerebral palsy.

The definition of cerebral palsy is a posture and movement disorder due to cerebral lesion which happens before, during or after the birth or until the complete development of the central nervous system. It is of a non-progressive nature, however it could be changeable with appropriate stimulation, and frequently associated to disturbances of speech, hearing, vision, swallowing, convulsion, alteration of behavior and a certain degree of primary or secondary mental retardation according to the lesion. This “disorder” is characterized by a clinical situation with

movement and posture disturbances, decreasing the capacity of the patient to perform voluntary movements of the muscles.¹⁻⁹

Cerebral palsy can be grouped into three main types which describe the disorders or movement and posture that may be experienced by a person. These are called spasticity, athetosis and ataxia^{3,8}.

Spasticity occurs when muscles are high in tone (tension) but weak in strength. A person experiencing spasticity may have difficulty in moving their limbs and adopting stable posture.

Athetosis refers to uncontrolled movements, which are often most noticeable when a person with this type of cerebral palsy commences movement. In addition, children with athetoid cerebral palsy often have very weak muscles or feel floppy when they are carried by another person.

Ataxia is characterised by unsteady, shaky movements or tremor. People with ataxic cerebral palsy and related disabilities have difficulty in using muscles to achieve balance and coordinated movement. This is the least common type of cerebral palsy and related disabilities.

It is important to observe that the difficulties of movement each person has will be unique. A person with cerebral palsy will often have a combination of the characteristics of the different types described above and postural characteristics may change as the person matures⁸.

The cortex controls thought, movement and sensation. An abnormality in the movement area of the cortex can result in spastic cerebral palsy^{1,2,9}.

The basal ganglia helps movement become organized, graceful and economical. An abnormality can result in athetoid cerebral palsy¹.

The cerebellum coordinates movement, posture and balance. An abnormality can result in ataxic cerebral palsy^{1,2,9}.

Specific words are used to describe the parts of the individual's body that are affected by cerebral palsy, such as⁷:

- **Diplegia** - Both legs and both arms are affected, being the legs more significantly affected than the arms. Children with diplegia usually have some clumsiness with their hand movements.
- **Hemiplegia** - The leg and arm on one side of the body are affected.
- **Quadriplegia** - Both arms and legs are affected. The muscles of the trunk, face and mouth can also be affected.

Differences in the clinical situation of the patient can be observed depending on when the lesions have occurred. The earlier the cerebral lesion occurs, the worse the prognostic of the case is, because the functions of the nervous system are dependent on each other. The development of the system many times depend on the development of another one, and the more immature the nervous system was at the time the lesion occurred, the more damages can be noticed, which explains the appearance of neurological disturbances, such as the convulsions and perception, mental and emotional alterations¹⁻⁹.

PHYSICAL RESTRAINT DURING DENTAL TREATMENT AT CAO

Physical restraint is used to prevent the patients from moving their body freely, because of their involuntary movements⁹⁻¹⁵. The physical restraint of the patient, during the dental treatment, is very important especially for those who have cerebral palsy, because these patients present some pathological reflexes which interfere in the dental assistance, such as:

1. **Asymmetrical cervical tonic reflex:** which is the stretching out of the upper limb on the side that the patient turns his face and the flexion of the upper limb to the opposite side (See Figure # 01).

- **The key point to inhibit this reflex:** Place the head of the patient in a straight line not holding him by the nape (See Figure # 02).

2. **The labyrinthine tonic reflex:** it occurs because of the changes of the position of the head when shaking or nodding it, stimulating the otolithic organs on both sides. The patients, when in dorsal decubitus, will present a spasticity in extension making an arch (opisthotonos) (See Figure # 03).



Figure 1 – Asymmetrical cervical tonic reflex



Figure 2 – The key point to inhibit the asymmetrical cervical tonic reflex

- **The key point to inhibit this reflex:** a shoulder protrusion should be made to the patient to keep

him in that position and to wrap him up with a band or sheet, always keeping the head of the patient in a straight line as to place a cylindrical pad or cushion made of a soft material under the patient's knees to do a semiflexion of the hips and knees. In order to offer more comfort and prevent involuntary stretching movements, a band should be carefully wrapped around the leg of the patient. The back of the dental chair must be at a maximum of 45 degrees of inclination in relation to the floor (See Figure # 04).



Figure 3 – Opisthotonos



Figure 4 – The key points to inhibit the labyrinthine tonic reflex

3. **Symmetrical cervical tonic reflex:** it is a proprioceptive response of the proprioceptor neck muscles by an active or passive movement of the head up and down. The elevation of the head produces an increase of the extending hypertonia of the arms and flexing hypertonia of the legs. When the head is down it presents the opposite effect (See Figure # 05).



Figure 5 – The symmetrical cervical tonic reflex

• **The key points to inhibit the pathological reflexes in cerebral palsy patients are:**

- a. head
- b. shoulder
- c. spinal column
- d. hips

4. The most appropriate position for a cerebral palsy patient on the dental chair: the head should be in a straight line, shoulders protruded with arms crossed on the trunk, hips and knees semiflexed, with the help of a soft cushion under the knees. The back of the dental chair must be at a maximum of 45 degrees of inclination in relation to the floor⁹⁻¹⁵.

After the inhibition of those reflexes, the patient relaxes and becomes more comfortable, so his dental treatment occurs normally, with no problems, only using some resources to keep the patient's mouth open (See Figure # 06).

DEVICES USED DURING PHYSICAL CONTENTION TO KEEP THE MOUTH OF THE PATIENTS OPEN:

I. Tongue spatula: made of wood or plastic, placing one spatula on top of the other and taped together, at a low cost. It is disposable and the use is simple (See Figure # 07).

II. "Molt" mouth opener: essential for the control of special need patients in lengthy treatments. It is made in two different sizes, for

children and adults; it allows an easier access to the other side of the mouth, which is kept open by a mouth holder.

There are some disadvantages, such as the high cost and they are likely to cause lacerations of the lips or palate, as well as luxation and fractures of teeth, when not properly used.

When in use make sure the mouth of the patient is not too wide open, for it could cause him to be uncomfortable and anxious, resulting in a higher level of resistance, and many times, with breathing difficulties (See Figure # 08).

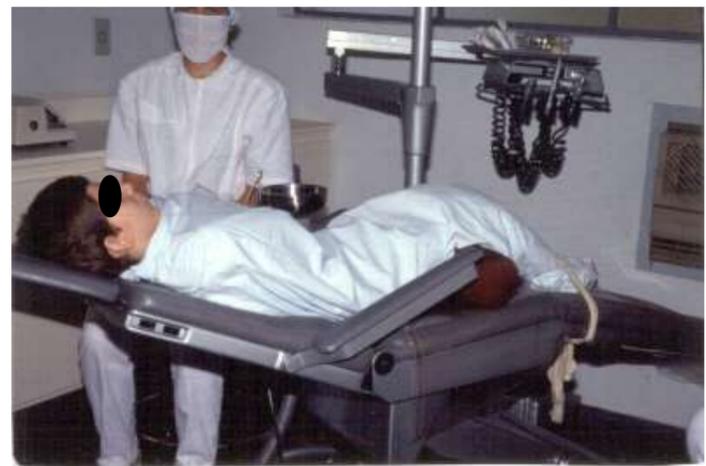


Figure 6 – The most appropriate position for a patient with cerebral palsy at the odontological chair



Figure 7 - Tongue spatulas

III. Biting Blocks: Made of rubber and in two sizes (small and large). They are placed between the occlusal surfaces of the posterior teeth to keep the mouth open. It is important to have a nylon string attached to the rubber block to make its removal easier in case of its displacement inside the mouth cavity of the patient (See Figure # 09).



Figure 8 - Bitting blocks



Figure 9 - "Molt" mouth opener



Figure 10 - Bottle necks

IV. Bottle neck: a device made with disposable soda bottle necks that after the necessary cuts and polishing turn into an excellent mouth opener and mouth opening keeper only for cerebral palsy children not for adults. (See Figure # 10). It has been successfully used for special need patients (up to eleven years old), not posing any risks nor causing any problems.

FINAL CONSIDERATIONS

All the devices used during the dental treatment in cerebral palsy patients, such as the physical restraint with bands or sheet to wrap them up, cylindrical pad or cushion made of a soft material, or simple tools including a homemade one to keep the mouth open are usually and safely used in CAOE⁹. All these simple devices are necessary, because there are no available funds for the acquisition of expensive material or equipment.

Despite of a shortage of resources we can easily and efficiently assist these patients.

When the communication with the patients is possible, the CAOE dentists explain the advantages of these physical restraint devices, and introduce them to the patient using an appropriate language like: the mouth opener being "**a chair for the teeth**", the sheets as "**safety wear**", and the bands as "**seat belts**" in order to make the patients feel "**protected and not threatened**"¹⁶

RESUMO

A paralisia cerebral é uma doença crônica que afeta o sistema nervoso central. Neste artigo são descritas técnicas utilizadas no Caoe/UNESP (Centro Odontológico de Assistência aos Pacientes com Necessidades Especiais da UNESP) para contenção de pacientes com paralisia cerebral durante o tratamento odontológico, uma vez que esses pacientes apresentam alguns reflexos patológicos que interferem na assistência odontológica. Também mostra como executar uma contenção física especial e como manter a boca aberta, utilizando ferramentas simples. Durante o tratamento odontológico em pacientes com paralisia cerebral realizado no CAOE são utilizados dispositivos simples de forma segura e eficiente, tais como a contenção física com bandas ou almofadas ou abridor de boca caseiro. Todos estes dispositivos simples são necessários, porque não há recursos disponíveis para a aquisição de materiais ou equipamentos caros.

Palavras Chave: Paralisia Cerebral; Assistência ao Paciente; Restrição Física; Reflexo

RESUMEN

La parálisis cerebral es una enfermedad crónica que afecta el sistema nervioso central. En el presente trabajo se

describen las técnicas utilizadas en Caoe / UNESP (Centro de Atención Dental para Pacientes con Necesidades Especiales UNESP) para la contención de los pacientes con parálisis cerebral durante el tratamiento dental, ya que estos pacientes tienen algunos reflejos patológicos que interfieren con el cuidado dental. También muestra cómo realizar una restricción física en particular y mantener la boca abierta, con herramientas sencillas. Durante el tratamiento dental en pacientes con parálisis cerebral realizado en CAOE simples dispositivos se utilizan de forma segura y eficaz, como la restricción física con bandas o almohadillas o mantenedor boca abierta hecha con material reciclable. Todos estos dispositivos simples son necesarios porque no hay recursos disponibles para la compra de materiales o equipos caros

Palabras clave: Parálisis Cerebral; Atención al Paciente; Restricción Física; Reflejo

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