

THE USE OF A DEVICE IN PARAFUNCTIONAL HABITS IN A PATIENT WITH NEURODEGENERATIVE DISEASE: CASE REPORT

O USO DE UM DISPOSITIVO EM HÁBITOS PARAFUNCIONAIS EM UM PACIENTE COM DOENÇA NEURODEGENERATIVA: RELATO DE CASO

EL USO DE UN DISPOSITIVO EN HÁBITOS PARAFUNCIONALES EN UN PACIENTE CON ENFERMEDAD NEURODEGENERATIVA: REPORTE DE CASO

Camila Melo Mesquita Luna¹, Anne Diollina Araújo Morais², Ealber Carvalho Macedo Luna³, Ana Livia Júnior Rodrigues⁴, Carloz Eduardo Mesquita Magalhães⁵, Filipe Nobre Chaves⁶

DOI: 10.54899/dcs.v22i82.3231

Recibido: 31/08/2025 | Aceptado: 01/09/2025 | Publicación en línea: 12/09/2025.

ABSTRACT

Introduction: Progressive Supranuclear Palsy (PSP) is a rare neurodegenerative parkinsonian disease in which its phenotype is defined based on the location of the tau protein accumulation in the structures of the Central Nervous System (CNS). Thus, patients are characterized by having supranuclear vertical gaze palsy, postural instability, dysphagia, changes in cognition, in addition to the possibility of compromising the motor activity of muscles, such as chewing, which could result in parafunctional habits such as bruxism. **Objective:** In this case report, the use of a device as a means of preventing and treatment for traumatic soft tissue injuries caused by bruxism secondary to PSP. **Case report:** A 67-year-old Brazilian patient, diagnosed with PSP, attended, with the help of her guardians, the local Dentistry reference service for Patients with Special Needs, complaining of a lesion on her lower lip. It was observed that the injury had a traumatic origin associated with intense bruxism. Therefore, we opted for conservative treatment. **Conclusion:** In the present case, it was observed that conservative techniques, such as the use of mouth guards, can be considered in the prevention and treatment of traumatic injuries associated with bruxism secondary to neurodegenerative diseases such as PSP.

Keywords: Progressive Supranuclear Palsy. Central Nervous System Diseases. Bruxism. Mouth Protectors.

¹ Master in Health Sciences, Chronic Diseases and Oral Cancer, Universidade Federal do Ceará (UFC), Sobral, Ceará, Brazil. E-mail: camilamelom89@gmail.com Orcid: <https://orcid.org/0000-0002-5712-6830>.

² Master in Health Sciences, Chronic Diseases and Oral Cancer, Universidade Federal do Ceará (UFC), Sobral, Ceará, Brazil. E-mail: annediollinaam@gmail.com Orcid: <https://orcid.org/0000-0002-7208-5520>.

³ PhD in Dentistry – Stomatopathology, Universidade Federal do Ceará (UFC), Sobral, Ceará, Brazil. E-mail: ealberluna@gmail.com Orcid: <https://orcid.org/0009-0001-3105-5827>.

⁴ Graduating in Dentistry, Faculdade Luciano Feijão (FLF), Sobral, Ceará, Brazil. E-mail: analiviajr1@gmail.com Orcid: <https://orcid.org/0009-0008-6866-1442>

⁵ Graduating in Dentistry, Faculdade Luciano Feijão (FLF), Sobral, Ceará, Brazil. E-mail: carlozeduardomesquitamagalhaes@gmail.com Orcid: <https://orcid.org/0009-0000-2530-6397>.

⁶ PhD in Dentistry – Stomatopathology, Universidade Federal do Ceará (UFC), Sobral, Ceará, Brazil. E-mail: Filipenobrechaves@gmail.com Orcid: <https://orcid.org/0000-0001-6345-8156>.

RESUMO

Introdução: A Paralisia Supranuclear Progressiva (PSP) é uma doença parkinsoniana neurodegenerativa rara, cujo fenótipo é definido com base na localização do acúmulo da proteína tau nas estruturas do Sistema Nervoso Central (SNC). Dessa forma, os pacientes são caracterizados por apresentarem paralisia supranuclear do olhar vertical, instabilidade postural, disfagia, alterações cognitivas, além da possibilidade de comprometimento da atividade motora de músculos, como a mastigação, o que poderia resultar em hábitos parafuncionais, como o bruxismo. **Objetivo:** Neste relato de caso, o uso de um dispositivo como meio de prevenção e tratamento para lesões traumáticas de partes moles causadas por bruxismo secundário à PSP. **Relato de caso:** Paciente brasileira, 67 anos, diagnosticada com PSP, compareceu, com auxílio de seus responsáveis, ao serviço de referência em Odontologia para Pacientes com Necessidades Especiais local, com queixa de lesão no lábio inferior. Observou-se que a lesão tinha origem traumática associada a bruxismo intenso. Portanto, optou-se pelo tratamento conservador. **Conclusão:** No presente caso, observou-se que técnicas conservadoras, como o uso de protetores bucais, podem ser consideradas na prevenção e tratamento de lesões traumáticas associadas ao bruxismo secundário a doenças neurodegenerativas como a PSP.

Palavras-chave: Paralisia Supranuclear Progressiva. Doenças do Sistema Nervoso Central. Bruxismo. Protetores Bucais.

RESUMEN

Introducción: La Parálisis Supranuclear Progresiva (PSP) es una enfermedad parkinsoniana neurodegenerativa poco frecuente, cuyo fenotipo se define según la localización de la acumulación de la proteína tau en las estructuras del Sistema Nervioso Central (SNC). Por lo tanto, los pacientes se caracterizan por presentar parálisis supranuclear de la mirada vertical, inestabilidad postural, disfagia, alteraciones cognitivas y la posibilidad de comprometer la actividad motora de músculos como la masticación, lo que podría derivar en hábitos parafuncionales como el bruxismo. **Objetivo:** En este caso clínico, se describe el uso de un dispositivo como medio de prevención y tratamiento de lesiones traumáticas de tejidos blandos causadas por bruxismo secundario a PSP. **Caso clínico:** Una paciente brasileña de 67 años, diagnosticada con PSP, acudió, con la ayuda de sus tutores, al servicio local de referencia odontológica para pacientes con necesidades especiales, refiriendo una lesión en el labio inferior. Se observó que la lesión tenía un origen traumático asociado a bruxismo intenso. Por lo tanto, se optó por un tratamiento conservador. **Conclusión:** En el presente caso se observó que las técnicas conservadoras, como el uso de protectores bucales, pueden ser consideradas en la prevención y tratamiento de lesiones traumáticas asociadas al bruxismo secundario a enfermedades neurodegenerativas como la PSP.

Palabras clave: Parálisis Supranuclear Progresiva. Enfermedades del Sistema Nervioso Central. Bruxismo. Protectores Bucles.



Esta obra está bajo una [Licencia Creative Commons Atribución- NoComercial 4.0 Internacional](https://creativecommons.org/licenses/by-nc/4.0/)

INTRODUCTION

Progressive Supranuclear Palsy (PSP), also called Richardson Syndrome (PSP-RS), is a rare neurodegenerative parkinsonian disease, usually occurring after 60 years of age, with a prevalence of 5-7 per 100,000 inhabitants (Steele et al., 1964 ; Nishimura et al., 2002; Coyle-Gilchrist et al., 2016). Its pathogenesis consists of the deposition of *tau protein* in structures such as the brainstem, subthalamic nucleus , basal ganglia, basal areas and dentate nucleus. This accumulation will give rise to neurofibrillary tangles that will be responsible for leading to neuronal death and consequently determine the phenotype of the disease (Litvan et al., 1996; Dickson et al., 2010; Armstrong et al., 2018).

Thus, the main manifestations and some of the diagnostic criteria include vertical supranuclear gaze palsy, axial rigidity, postural instability favoring falls, especially in the first year of the disease, dysphagia, dysarthria, cognitive alterations and poor response to Levodopa (Livtan et al., 1996; Boxer et al., 2017).

In addition to these manifestations, the impairment of the structures of the Central Nervous System (CNS) is related to hyperactivity of the masticatory muscles, triggering secondary bruxism and trismus (Van Grootheest et al., 2007; Lobbezoo et al., 2012; Verhoeff et al. ., 2012). This functional disorder can cause lesions in the soft tissues of the oral cavity that lead to deformities, discomfort for the patient, hypovolemia due to abundant bleeding, in addition to being considered a “gateway” for the colonization of pathogens (Franco et al., 2015) .

The objective of the present study is to report the clinical case of a patient diagnosed with PSP who developed ulceration in the lower lip due to intense hyperactivity of the masticatory muscles.

CASE REPORT

Female patient, 67 years old, diagnosed with PSP, hypertensive and diabetic, using Metformin Hydrochloride, Simvastatin and Duloxetine Hydrochloride, sought with the help of those responsible for the local reference service of Dentistry for Patients with Special Needs due to the presence of ulcerative lesion on the lower lip. As reported by the caregiver, the lesion had an evolution time of 02 months, as well as the habit of biting her lower lip with associated intense bruxism. In addition, observed characteristics inherent to PSP such as vertical gaze paralysis

(Figure 1), muscle stiffness, postural instability, cognitive impairment, difficulty breathing and consequently low oxygen saturation and mouth opening restricted to 10mm (Figure 2). Therefore, some measures were adopted to provide comfort for the patient during dental care, such as the 45° inclination of the backrest of the dental chair, monitoring oxygen saturation as well as its supply and short-term dental care.

Figure 1. : Lower lip ulcer associated with bruxism and trismus.



Source: Prepared by the authors themselves.

During the extraoral physical examination evaluation, it was verified the presence of an extensive ulcer in the vermilion of the lower lip of the right hemiface (Figure 3), measuring approximately 10mm. When performing the occlusion test, it was possible to visualize that the location of the lesion coincided with the tip of the cusp of tooth 13. It is important to emphasize that there were no other ulcerated areas in the oral cavity. The diagnostic hypothesis at first was an ulcer caused by constant trauma to the lower lip associated with tooth 13.

Figure 2. : Prefabricated EVA mouthguard.



Source: Prepared by the authors themselves.

For the treatment of the lesion on the lower lip, a conservative intervention was chosen through the use of a simple, prefabricated EVA mouthguard (Figure 2) adapted according to the patient's needs. Therefore, the protector was molded using water heated to 180°. The device was then cut with a cold scalpel (blade no. 15) to make it comfortable to use, in addition to not interfering with breathing and facilitating its removal for cleaning (Figure 3). As a topical medication, the use of Triamcinolone Acetonide (1mg/g) was prescribed, being used three times a day, for five days.

Figure 3.: Mouthguard fitted in position.



Source: Prepared by the authors themselves.

After 15 days, the patient returned showing significant improvement in the condition, with regression of the lesion and still in the healing process (Figure 4).

Figure 4. : Injury after 15 days of using the mouthguard.



Source: Prepared by the authors themselves.

DISCUSSION

According to Verhoeff et al (2022) bruxism may be present in patients diagnosed with neurodegenerative diseases, such as Alzheimer's disease and Parkinson's disease. The relationship between dopamine levels and changes in muscle activity is considered.

However, there are not enough studies in the literature explaining the relationship between bruxism and PSP, as well as the dental management to be adopted, especially when there is trauma to the oral tissues.

According to Franco et al (2015) carried out with patients admitted to the adult Intensive Care Unit, forms of treatment and prevention of oral lesions caused by secondary bruxism and trismus were used. The forms of intervention ranged from the most conservative stages to the most radical form of treatment: topical application of corticoids, application of botulinum toxin, rounding of sharp cusps, installation of mouthguards and tooth extractions (in more severe cases).

In the present study, it was chosen to use the minimally traumatic technique by adapting a simple prefabricated EVA mouthguard together with the topical application of the corticosteroid triamcinolone three times a day for five days. After fifteen days, regression of the area of ulceration on the lower lip was observed.

The choice of the used technique was based on some points inherent to the patient, such as: limitation of mouth opening restricted to 10mm, the fact that the patient still had good dental support, maintenance of the vertical dimension and being considered a procedure with a short

duration. duration that does not require the postoperative stage.

The study by Ribeiro et al., (2012) reported a clinical case of a patient diagnosed with PSP, who presented traumatic lesions in the upper lip and alveolar ridge associated with irregular incisal edges of the lower incisors, canines and premolars. As a form of treatment, unlikely what was adopted in this study, it was decided to perform the extraction of all remaining dental elements.

As seen in this study, the use of mouthguards has been an effective way of treating and preventing traumatic oral lesions caused by secondary bruxism and trismus in patients with neurodegenerative diseases such as PSP. However, it is necessary to evaluate each patient so that the correct technique can be used.

CONCLUSION

In the present study, it was demonstrated the success of using mouth guards as a conservative technique for the prevention and treatment of oral lesions in patients diagnosed with PSP. Assessment is necessary so that the form of dental intervention can be used correctly, always paying attention to the needs of each patient.

REFERENCES

Armstrong MJ. Progressive Supranuclear Palsy: an Update. **Curr Neurol Neurosd Rep** 2018; 18:12.

Boxer AL, Lang AE, Grossman M, Knopman DS, Miller BL, Schineider LS, Doody RS, Lees A, Golbe LI, Williams DR, Corvol JC, Ludolph A, Burn D, Lorenzl S, Litvan I, Roberson ED, Hoglinger GU, Koestler M, Jack CR, Deerlin VV, Randolph C, Lobach IV, Heuer HW, Gozes I, Parker L, Whitaker S, Hirman J, Stewart AJ, Gold M, Marimoto BH. Davunetide for Progressive Supranuclear Palsy: a multicenter, randomized, double-blind, placebo controlled trial. **Lancet Neurol** 2014; 13: 676-685.

Coyle-Gilchrist ITS, Dick KM, Petterson K, Rodríguez PV, Wehmann E, Wilcox A, Lansdall CJ, Dawson KE, Wiggins J, Mead S, Brayne C, Rowe JB. Prevalence, characteristics, and survival of frontotemporal lobar degeneration syndromes. **Neurology** 2016; 86: 1736-43.

Dickson DW, Ahmed Z, Algom AA, Tsuboi Y, Josephs KA. Neuropathology of variants of progressive supranuclear palsy. *Current Opinion in Neurology* 2010; 23: 394-400.

Franco JB, Barquette NM, Jales SMCP, Zambon CE, Guardieiro PR, Matias DT, Ortegosa MV, Peres MPSM. Utilização de protetores bucais em pacientes internados na unidade de terapia intensiva: proposta de protocolo. **Arq Med Hosp Fac Cienc Med Santa Casa São Paulo** 2015;

60: 85-90.

Livtan I, Hauw JJ, Bartko JJ, Lantos PL, Daniel SE, Horoupian DS, McKee A, Dickson D, Bancher C, Tabaton M, Jellinger K, Anderson DW. Validity and Reliability of the Preliminary NINDS Neuropathologic Criteria for Progressive Supranuclear Palsy and Related Disorders. **Journal of Neuropathology and Experimental Neurology** 1996; 55: 97-105.

Lobbezoo F, Ahlberg J, Glaros AG, Kato T, Koyano K, Lavigne GJ, De Leeuw R, Manfredini D, Svensson P, Winocur E. Bruxism defined and graded: an international consensus. **Journal of Oral Rehabilitation** 2013; 40: 2-4.

Nishimura M, Kaji R, Ohta M, Mizuta I, Kuno S. Association Between Dopamine Transporter Gene Polymorphism and Susceptibility to Parkinson's Disease in Japan. **Movement Disorders** 2002; 17: 831-845.

Ribeiro MTF, Silveira LB, Moreira AN, Ferreira EF, Vargas AMD, Ferreira RC. Cuidados Odontológicos na paralisia supranuclear progressiva: relato de caso. **Rev Bras Geriatr Gerontol** 2012; 15: 381-388.

Steele JC, Richardson JC, Olszewski J. Progressive supranuclear palsy. A heterogeneous degeneration involving the brain stem, basal ganglia and cerebellum with vertical gaze and pseudobulbar palsy, nuchal dystonia and dementia. **Arch Neurol.** 1964;10: 333–58.

Verhoeff MC, Koutris M, Berendse HW, van Dijk KD, Lobbezoo F. Parkinson's disease, temporomandibular disorder pain and bruxism and its clinical consequences: a protocol of a single-centre observational outpatient study. **BMJ Open** 2022; 12: e052329.