

## Case Report Article

# Use of chameleon composite resins in Dentistry: case report

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## Abstract

**Introduction:** Non-carious cervical lesion (NCCL) is characterized as wear in the cervical region of the tooth, not caused by caries, which can directly affect quality of life. Therefore, its treatment is essential, as the main symptom is pain. One of the forms of treatment for this type of injury is restoration with composite resins. Aiming at greater ease in choosing the color, the chameleon resin was proposed, not having color variations like conventional resins, containing only one color. This resin has the ability to copy the color of the substrate that is inserted. **Objective:** Is to report a clinical case of a female patient, where chameleon resin was used in LCNC. **Case report:** Patient J. P., female, 31 years old, attended the dental clinic of Universidade Tuiuti do Paraná, complaining of tooth sensitivity and diagnosis of bruxism. Anamnesis was performed and it was observed that there were LCNC in several teeth. For the treatment of sensitivity, the option was to perform restorations with composite resin. Resins from different brands were used: Vittra Unique by FGM<sup>®</sup> Admira Fusion X-tra by Voco<sup>®</sup> and Vittra Unique Flow by FGM<sup>®</sup>. Relative isolation was performed with a retractor wire. After the selective acid etching, it was washed and dried for application of the universal adhesive Futurabond U by Voco<sup>®</sup> and afterwards, light curing with the Bluephase N Light Cure by Ivocla Vivadent<sup>®</sup>. Then, restoration was performed with chameleon resin and photopolymerization of the reconstructed region. After finishing the restorations, finishing and polishing began. **Results:** After completing the procedure, the patient reported greater satisfaction with the aesthetics and no pain. **Conclusion:** The monochromatic composite resin is an excellent choice of restorative therapy for this type of injury.

## Introduction

Non-carious cervical lesions (NCCL) are present in around 60% of patients and can directly affect quality of life. Its treatment is therefore essential, as the main symptom is pain, and men are most affected, with a higher prevalence in premolars, canines and upper molars [5]. NCCLs are more frequent in premolars due to the tension created by the biomechanics and bone thickness in this region of the face [7].

NCCL is characterized as wear in the cervical region of the tooth, not caused by caries, and it is increasingly common to observe them in daily clinical practice [8, 7]. The etiology of this condition is multifactorial and may be associated with factors such as biocorrosion and abfraction [13]. In addition, other causes may be linked to this lesion, such as the patient's habits, inadequate brushing, toothbrushes with hard bristles, acidic drinks, bruxism, among other habits [7]. Early diagnosis and monitoring of the degree of tooth wear is therefore essential [5]. One form of treatment for this type of lesion is restoration with composite resins [13].

Composite resins have been perfected over time as aesthetic demand has increased, so their characteristics have become better and better. Resins have different shades due to the different colors of patients' teeth, and to reproduce the natural color of the substrate in layers of 3 or more shades, they are available in different shades of dentin and enamel [1]. With a view to making it easier to choose a shade, the chameleon resin was proposed, which does not vary in color like conventional resins and contains only one shade. This resin has the ability to copy the color of the

substrate it is inserted into, causing a chameleon effect, thus dispensing with the need to stock a large range of composite resin colors, reducing treatment time and color selection. This effect is due to the size of the filler particles, which are uniform at 260 nm using the sol-gel method [10]. However, the scientific literature still lacks new studies on this resin [3]. Thus, the aim of this study is to report a clinical case of a female patient, where conventional and flowable chameleon resin was used in non-carious cervical lesions.

## Case report

A 31-year-old female patient, J.P., came to the dental clinic at the Tuiuti University of Paraná complaining of tooth sensitivity and a diagnosis of bruxism. An anamnesis was taken using the information provided, and it was observed that there were non-carious cervical lesions on several teeth. The lesions were well defined, with no dental biofilm, rounded edges and healthy gingival tissue. The patient reported that she was wearing an occlusal plate to treat bruxism.

For the treatment of sensitivity due to dentin exposure, the option was to perform direct restorations with composite resin, since the cause of the lesions was already being properly treated. Resins from different commercial brands were used to observe the characteristics of each one. Two conventional composite resins, Vittra Unique by FGM® (Joinville, SC, Brazil) and Admira Fusion X-tra by Voco® (Cuxhaven, Germany), and one fluid composite resin, Vittra Unique Flow by FGM® (Joinville, SC, Brazil) (figure 1).



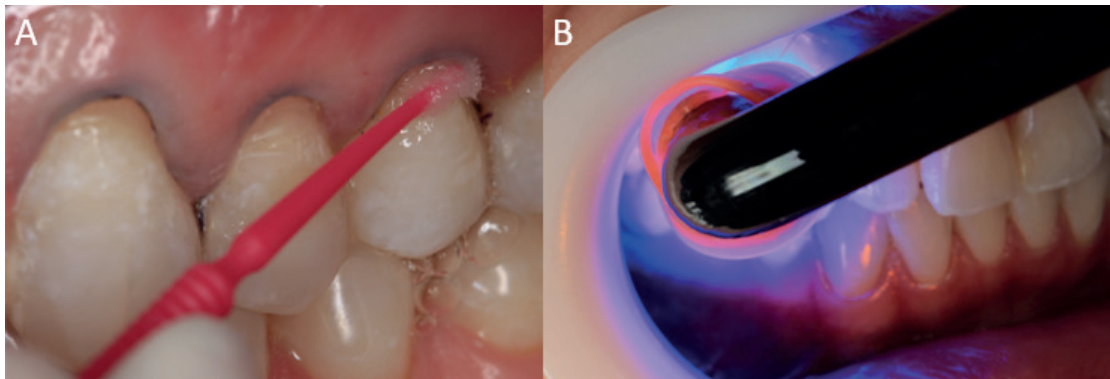
**Figure 1** - A) FGM® Vittra Unique composite resin; B) Voco® Admira Fusion X-tra composite resin; C) FGM® Vittra Unique Flow composite resin

Firstly, prophylaxis was carried out using pumice stone, water and a Robinson brush in the area where the lesions were located. Afterwards, the area was relatively isolated and the retractor wire was placed to keep the gingival tissue away and to better visualize the lesions (figure 2A). Selective acid etching (figure 2B) was carried out only on the enamel around the lesions and after 30 seconds it was washed and dried to apply the adhesive. The Futurabond U universal adhesive from Voco® (Cuxhaven,

Germany) (figure 2C) was applied and rubbed with a microbrush over the lesion area (figure 3A), and then light-cured with the Bluephase N light-curing device from Ivocla Vivadent® (Schaan, Liechtenstein) for 20 seconds (figure 3B).



**Figure 2** - A) Relative isolation using a retractor wire; B) selective acid etching on enamel; C) Voco® Futurabond U universal adhesive



**Figure 3** - A) Application of universal adhesive to dentin and enamel, using a microbrush; B) Bluephase N photopolymerizer by Ivoclar, Vivadent®

Next, the restoration was carried out with chameleon resin, in small increments and recovering the anatomy of the cervical region of the element, where the lesion was located, and then light-curing the reconstructed region for 20 seconds. Once the restorations were complete, the retractor wires were removed and then the finishing was started with coarse to fine-grained discs in order to regularize the restored surfaces (figure 4A). The procedure was then completed with a polishing disk and Ultradent® (Indaiatuba, SP, Brazil) Diamond Polish Mint paste (figure 4B).



**Figure 4** - A) Finishing the restoration with sandpaper disks; B) polishing the restoration

After the procedure was completed, the patient reported greater satisfaction with the aesthetics and improved pain (figure 5). The case was continued for 6 months, and a reduction in hypersensitivity was observed, resulting in an improvement in the patient's quality of life, since the clinical picture of pain affected the performance of various activities of daily living.





**Figure 5** – Cervical restorations completed in the 2nd quadrant. Element 23 – Vittra Unique by FGM®; element 24 – Admira Fusion X-tra by Voco®; element 25 – Vittra Unique Flow by FGM®

## Discussion

Chameleon composite resin has the ability to reflect the color of the dental substrate it is in contact with, regardless of its shade, creating a chameleon effect [10]. The aim of this study was to report on the use of this monochromatic resin composite in NCCL, analyzing its main characteristics (ease of handling, reduction of conventional resins in stock, service time and chameleon effect on the dental substrate). In this clinical case, after the patient had been treated with chameleon composite resin from more than one commercial brand, an aesthetic improvement and a reduction in dentinal hypersensitivity were observed.

Some authors report that the etiology of NCCLs is still unknown, as it can be multifactorial, being caused by various factors and being linked to patients' customs [8, 7]. In this sense, Zucchelli *et al.* [13] report that it involves some factors such as corrosion and possibly abfraction [13]. In the case presented here, the possible etiological factor was abfraction, bruxism, following what some authors have reported as one of the causes.

Crisóstomo *et al.* [7] report that the highest prevalence is in posterior teeth, more specifically in premolars. This is due to the tension created by biomechanics and the thickness of the bone in this region of the face, making it more likely for these lesions to occur, but it depends on other factors for it to develop, such as the location, frequency, duration, quantity and reference of eccentric occlusal forces. The appearance of the lesion can vary according to the amount of wear, ranging from large oval-shaped shallow depressions

to large triangular-shaped wear [7]. Therefore, it was possible to observe that she had lesions on the upper and lower canines, premolars and molars and in the form of shallow oval depressions.

The indications for treatment for those with this type of lesion are due to aesthetics and, above all, hypersensitivity [13]. When NCCL is present, it can directly affect the aesthetics, form and function of the dental element, and its treatment is essential, as the main symptom is pain, affecting the patient's quality of life, and affecting around 60% of patients who arrive at the clinic [8, 5]. The patient reported discomfort in some common daily activities, such as drinking cold water, affecting her quality of life and requiring restoration of the lesions.

The use of chameleon resins is indicated for various types of restorations, but the chameleon effect is dependent on the size of the restoration, increasing the effect in smaller restorations and decreasing it in large restorations [11]. When you have a class III and IV restoration in anterior teeth, you need to use a more opaque conventional resin to block out the background, so that the restoration with the chameleon resin doesn't become translucent. Thus, a thin layer of 0.5 mm must be inserted into the palatal/lingual area and then the filling with the chameleon resin is finished [2]. For this patient, it was not necessary to use conventional resin, as the lesions were in the cervical region and small in size.

The shades of conventional composite resins are applied by colorants added to the resin matrix, which is known as a chemical coloring technique. When light reflects off these resins, specifically the particles, it scatters and diffuses in different directions. Knowing this, the filler particles in the resins can have a great influence on the characteristics of the light fraction [6]. However, the chameleon effect in chameleon resins is due to the size of the filler particles, which are uniform at 260 nm by the sol-gel method, and the structural color phenomena depend on the difference in wavelength when the incident light interacts with nanostructures such as thin films, gratings or photonic crystals [10].

This resin does not contain any additional colorants, while the fillings themselves reproduce a red-yellow hue similar to the structural color of the substrate [2]. In the study, it was observed that after restoring the lesions with chameleon resin, there was no color difference between the substrate and the resin (chameleon effect), so an excellent aesthetic result was obtained.

## Conclusion

It was concluded that monochromatic composite resin is an excellent choice of restorative therapy for this type of lesion (LCNC).

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