

# Techniques to Avoid Bleeding of Gingiva during Dental Restorations - Hand Instrument for Gingival Displacement

Jesús M. González-González

Doctor of Medicine and Surgery (University of Alicante). Specialist in Stomatology (University of Murcia). Private practice in Salamanca (Spain)

**Abstract:** ***Introduction:** when a dental restorative treatment is done near the gingiva, it can bleed and restoration will be defective. The aim of this work was to study techniques that prevent the bleeding of the gingiva during dental restorations and propose a hand instrument for gingival displacement. **Materials and methods:** It was made a review of dental products distributed online through the web pages of 50 companies, from 6 different European countries. It was tried to locate materials and hand instruments to prevent bleeding of the gingiva during dental restorations. **Results:** no hand instrument was found among the materials distributed by those companies for that purpose. We propose an instrument consisting of three parts: an "active part, "a "handle" and a "zone of union". **Discussion:** for its application, it is placed in the "free gingival sulcus". Direct pressure on the gingiva gives hemostasis, which facilitates the restoration. **Conclusions:** the usefulness of this instrument is in "Conservative Dentistry" to restore tooth cervical lesions.*

**Keywords:** restoration, instrument, retraction, gingival, hand

## 1. Introduction

Cavities in the tooth surface are usually caused by bacteria and they should be restored with a dental treatment. Dr. G. V. Black, more than a century ago, classified these cavities in 6 types according to the area of the tooth where the injury was located [1]. This classification is still used today. The cavity "Class V of Dr. Black" refers to a lesion on dental gingival surface, which can be both lingual and buccal sides of tooth.

When the dental restorative treatment is made in an area close to the gingival the bleeding can occur and that prevents the apposition of filling materials during the restoration. If a conditioner of cavity, adhesive, silver amalgam, ionomer, composite or any other restorative material is placed in these conditions, they are contaminated with blood from the gingiva. Then a film is formed between that materials and the dental surface, and finally the restoration will be defective.

Occasionally, the composite used to restoration can have a contraction, causing a failure of the marginal seal and loss of adhesive bond [2].

Over time, different solutions have been proposed, among which are:

- Electrocoagulation of the gingiva.
- Lengthening of the crown by mucogingival surgery sutured apically, with subsequent restoration in a second time [3].
- Retraction cord [4-9]: it can be impregnated in aluminum chloride with lidocaine (racestypine, Septodont), in adrenaline and phenylsulfonate (medi-Kord thread, maison dentaire), or do not carry any impregnation (septofil retraction thread, Septodont). It is vasoconstrictor and astringent. For use it is introduced in the "free gingival sulcus", pressing the gingiva outside the restoration site.

- Strips [10]: similar to the retraction cord.
- Rubber dam: it has been described as an element of isolation [11], which can be used in all areas of restorative dentistry [12], including cervical lesions [13].
- Astringent gels, or derivatives of kaolin and aluminum chloride [14] or other types of medicated pastes [6,7,15-20].
- Transparent or steel matrix bands[14,21]: it must be fastened with tweezers.

Taking into account the above, the objective of this work was to study techniques that prevent bleeding of the gingiva during dental restorations and propose an instrument for that purpose.

## 2. Material and methods

It was made a review of dental products distributed online through the web pages of 50 companies, from Germany, Spain, France, England, Italy and Portugal, (table 1). In their product catalogs was studied hand instruments and materials that prevent bleeding of the gingiva during dental restorations.

## 3. Results

No hand instrument was found to that purpose, for this reason we specifically propose one, which consist of three parts (figure 1):

- An "active part" that has a curved shape to adapt to the tooth and the gingiva. It is flat to be inserted between the tooth and the free gingiva. It has a concave part (close to the tooth) and a convex part (close to the gum).
- A "handle" of the instrument that is an elongated cylinder that can be variable in its shape. Its only function is to hold the instrument.
- A "zone of union" between the active part and the handle, short in length and with a variable angle.

Volume 7 Issue 11, November 2018

[www.ijsr.net](http://www.ijsr.net)

Licensed Under Creative Commons Attribution CC BY

A single handle can have two active parts, one at each end, which may be the same or different in size.

#### 4. Discussion

The solutions proposed to avoid bleeding of the gingiva during dental restorations, have several drawbacks. For example, electrocoagulation requires previously prepare the electrocautery and it increases morbidity in the gingiva. The retraction cord [4,22,23] is sometimes difficult to put on and in other occasions it damages the gingiva or causes more bleeding during its application. The rubber dam [11-13] has been described as very useful, but in practice clamps can rarely be put, because they adapt poorly to the area. Astringent gels [14] have several drawbacks, such as: a) they usually require wait time for the chemical effect on the gingiva, b) they do not always give the expected result [24], c) they sometimes can cause inflammatory reaction [25,26] and d) they can be potentially cytotoxic [28]. Some authors indicate that these systems are better than the use of retraction cord [6,7,28,29], although for other authors [30,31] the latter give greater retraction. Transparent and steel matrix bands are another alternative [14,21], but when two pieces (matrix and clamp) are used to isolate the area it is more difficult than if only one element is employed. Most of the gingival retraction systems are mechanical-chemical, but according to authors there are not significant superiority between them [32,33].

Taking into account the previous products we propose a hand instrument that avoids those inconveniences. For its application, it is placed next to the area of the tooth to be restored, in the "free gingival sulcus" pressing the "free gingiva" (figure 2). Direct pressure on the gingiva with the instrument gives a rapid hemostasis and that allows a easy restoration. This pressure must be maintained throughout the time in which the restoration is being carried out. In most cases the dentist can hold the instrument in place with one hand while the other one does the restorative treatment. In some other case it may be necessary to do a "four hands" treatment, with the help of the clinical assistant at the same time.

Compared to the other gingival retraction systems, the advantages of this instrument are:

- It is easy to use.
- It is a single instrument. The electrocautery or the matrices, both have several elements, or requires several instruments.
- It has rigidity and can be applied in the area with a single hand movement. This does not happen with the retraction cord, which requires several movements of the hand, to finally place it in its place.
- The instrument can be sterilized.
- It is quick to apply, which speeds up the treatment. This does not happen with astringent gels, because they require time to take effect.
- It has easy control. The dentist is who makes direct use of the instrument pressing on the gingiva.
- It has predictable use. It is easy to see the result of their use.

#### 5. Conclusion

The utility of this instrument is in "Conservative Dentistry", to restore cervical lesions of the teeth, Class V according to the classification of cavities of Dr. G.V. Black.

#### References

- [1] Baum LI, Philips R, Lund M. Tratado de operatoria dental. 2ª ed. Mexico: Nueva Editorial Interamericana, 1987:23-6.
- [2] Davison CL, Kemp-Scholte CM. Inconvenientes de las resinas composite en las restauraciones de clase V. Journal of Esthetic Dentistry. Ed. Esp. 1991;1(1):7-10.
- [3] Hempton TJ, Drakos D, Nart J, Santos A. Tratamiento de la lesión de clase V: ¿Alargamiento o acortamiento de la corona? Periodoncia y osteointegración 2007;17(2):75-84.
- [4] Grandini R, Bertini F, Marri M. La aplicación del separador de ivory en las reconstrucciones dentales. Av. en Odontostomatol 1989;6:355-65.
- [5] Anupam P, Namratha N, Vibha S, Anandakrishna GN, Shally K, Singh A. Efficacy of two gingival retraction systems on lateral gingival displacement: A prospective clinical study. J Oral Biol Craniofac Res. 2013;3(2):68-72.
- [6] Bennani V, Inger M, Aarts JM. Comparison of pressure generated by cordless gingival displacement materials. J Prosthet Dent. 2014;112(2):163-7.
- [7] Prasanna GS, Reddy K, Kumar RK, Shivaprakash S. Evaluation of efficacy of different gingival displacement materials on gingival sulcus width. J Contemp Dent Pract. 2013;14(2):217-21.
- [8] Kumbuloglu O, User A, Toksavul S, Boyacioglu H. Clinical evaluation of different gingival retraction cords. Quintessence Int. 2007;38(2):e92-8.
- [9] Jokstad A. Clinical trial of gingival retraction cords. J Prosthet Dent. 1999; 81(3):258-61.
- [10] Shivasakthy M, Asharaf Ali S. Comparative Study on the Efficacy of Gingival Retraction using Polyvinyl Acetate Strips and Conventional Retraction Cord - An in Vivo Study. J Clin Diagn Res. 2013;7(10):2368-71.
- [11] Lozano De Luaces V, Robledano Vicente L, Latre Barluenga A. Valoración del grado de contaminación de las preparaciones cavitarias usando diferentes métodos de aislamiento. Revista Europea de Odontostomatología 1993;V(4):206-8.
- [12] Langerweger CH. Aislamiento del campo operatorio en odontología infantil. El aislamiento del campo operatorio con dique de goma. Quintessence (ed. esp.) 2001;14(10):636-46.
- [13] Liebenberg WH. Rubber dam isolation of cervical lesions. Part 1: alternative technique which avoid injury to the periodontium. FDI World 1994;3(5):17-8, 20, 22.
- [14] Anton-Radigales M. Imitación de la encía con composite. Cirugía mucogingival no quirúrgica. RCOE 2005;10(3):309-321.
- [15] Hong LG, Guo LP, Xue LL. Gingival retraction paste versus gingival retraction cord for fixed prosthodontics: a systematic review. Shanghai Kou Qiang Yi Xue. 2013;22(4):456-61.
- [16] Chaudhari J, Prajapati P, Patel J, Sethuraman R, Naveen YG. Comparative evaluation of the amount of gingival

displacement produced by three different gingival retraction systems: An in vivo study. *Contemp Clin Dent.* 2015; 6(2):189-95.

[17] Lahoti KS. Effect of various chemical agents used in gingival retraction systems on smear layer: Scanning electron microscope study. *Contemp Clin Dent.* 2016;7(1):27-30.

[18] Burke FJ, Crisp RJ. Evaluation of a novel compule-based gingival retraction system in UK general dental practices. *Dent Update.* 2014;41(5):432-4, 437-8.

[19] Akca EA, Yildirim E, Dalkiz M, Yavuzyilmaz H, Beydemir B. Effects of different retraction medicaments on gingival tissue. *Quintessence Int.* 2006;37(1):53-9.

[20] Bowles WH, Tardy SJ, Vahadi A. Evaluation of new gingival retraction agents. *J Dent Res.* 1991;70(11):1447-9.

[21] García Barbero AE, Baños Martín JL, García Barbero J. Problemática de las matrices para composite en dientes posteriores. *Av. en odontostomatol.* 1995;11:503-12.

[22] Gupta A, Prithviraj DR, Gupta D, Shruti DP. Clinical evaluation of three new gingival retraction systems: a research report. *J Indian Prosthodont Soc.* 2013;13(1):36-42.

[23] Polat NT, Ozdemir AK, Turgut M. Effects of gingival retraction materials on gingival blood flow. *Int J Prosthodont.* 2007;20(1):57-62.

[24] Huang C, Somar M, Li K, Mohadeb JV. Efficiency of Cordless Versus Cord Techniques of Gingival Retraction: A Systematic Review. *J Prosthodont.* 2015; Sep 17. Version of record online: doi: 10.1111/jopr.12352.

[25] Lodetti G<sup>1</sup>, D'Abrosca F, Fontana P, Pavoni E, Gigola P. Set up of in vitro methods able to detect the safety of astringent liquids. *Minerva Stomatol.* 2004;53(6):361-7.

[26] Sarmento HR, Leite FR, Dantas RV, Ogliari FA, Demarco FF, Faot F. A double-blind randomised clinical trial of two techniques for gingival displacement. *J Oral Rehabil.* 2014;41(4):306-13.

[27] Liu CM, Huang FM, Yang LC, Chou LS, Chou MY, Chang YC. Cytotoxic effects of gingival retraction cords on human gingival fibroblasts in vitro. *J Oral Rehabil.* 2004; 31(4):368-72.

[28] Pesson DM, Bakou OD, Didia EL, Kouame A, Blohoua MR, Djeredou KB. Gingival displacement techniques in daily practice. Survey among dental surgeons in Abidjan, Ivory Coast. *Odontostomatol Trop.* 2015;38(152):25-32.

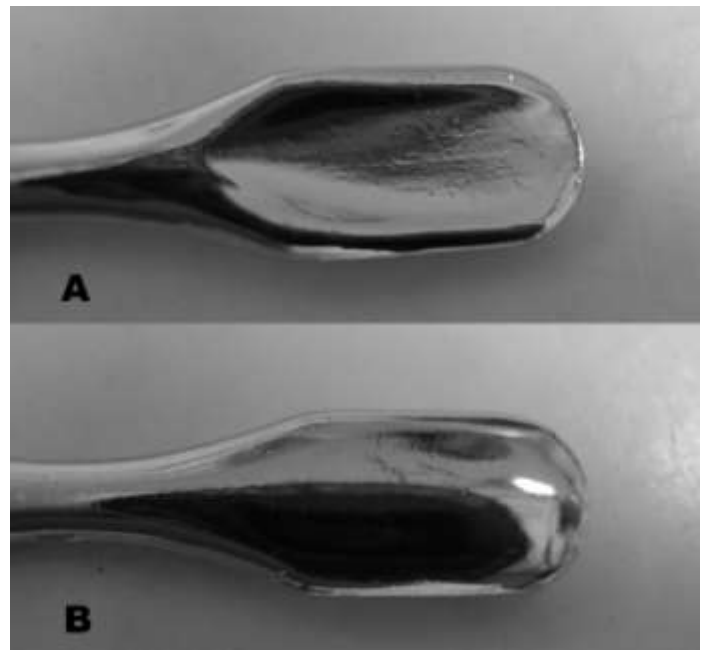
[29] Acar Ö, Erkut S, Özçelik TB, Ozdemir E, Akçil M. A clinical comparison of cordless and conventional displacement systems regarding clinical performance and impression quality. *J Prosthet Dent.* 2014;111(5):388-94.

[30] Shrivastava KJ, Bhojar A, Agarwal S, Shrivastava S, Parlani S, Murthy V. Comparative clinical efficacy evaluation of three gingival displacement systems. *J Nat Sci Biol Med.* 2015;6(Suppl 1):S53-7.

[31] Bennani V, Aarts JM, He LH. A comparison of pressure generated by cordless gingival displacement techniques. *J Prosthet Dent.* 2012;107(6):388-92.

[32] Tabassum S, Adnan S, Khan FR. Gingival Retraction Methods: A Systematic Review. *J Prosthodont.* 2016 Jul 28. Version of record online: doi: 10.1111/jopr.12522.

[33] Bennani V, Schwass D, Chandler N. Gingival retraction techniques for implants versus teeth: current status. *J Am Dent Assoc.* 2008;139(10):1354-63.



**Figure 1:** concave (A) and convex (B) aspect in the active part of hand instrument used in gingival displacement.



**Figure 2:** hand instrument is applied between the tooth and the gingiva. Complete restoration.

**Table 1:** web pages of companies that are distributors of dental products, by countries

Germany: <a href="http://www.dentalogixx.de/">www.dentalogixx.de/</a> <a href="http://www.dentiqua.de/">www.dentiqua.de/</a> <a href="http://www.shr-dental-de/">www.shr-dental-de/</a>	England: <a href="http://www.benco.com/">www.benco.com/</a> <a href="http://www.darbydental.com/">www.darbydental.com/</a> <a href="http://www.davisdentalsupply.com/">www.davisdentalsupply.com/</a> <a href="http://www.dcdental.com/">www.dcdental.com/</a> <a href="http://www.dental-directory.co.uk/">www.dental-directory.co.uk/</a> <a href="http://www.henryschein.com/">www.henryschein.com/</a> <a href="http://www.kentexpress.co.uk/">www.kentexpress.co.uk/</a> <a href="http://www.msdentalsupply.com/">www.msdentalsupply.com/</a> <a href="http://www.pattersondental.com/">www.pattersondental.com/</a> <a href="http://www.prestigedental.co.uk/">www.prestigedental.co.uk/</a> <a href="http://www.stardentalsupply.com/">www.stardentalsupply.com/</a> <a href="http://www.usdentaldepot.com/">www.usdentaldepot.com/</a>
Spain: <a href="http://www.brokerdental.es/">www.brokerdental.es/</a> <a href="http://www.casa-schmidt.es/">www.casa-schmidt.es/</a> <a href="http://www.comiber.com/">www.comiber.com/</a> <a href="http://www.dentalcost.es/">www.dentalcost.es/</a> <a href="http://www.dentalexpress.es/">www.dentalexpress.es/</a> <a href="http://www.dentalmailing.es/">www.dentalmailing.es/</a> <a href="http://www.dental-tix.com/">www.dental-tix.com/</a> <a href="http://www.dentpro.es/">www.dentpro.es/</a> <a href="http://www.djldental.com/">www.djldental.com/</a> <a href="http://www.dvd-dental.com/">www.dvd-dental.com/</a> <a href="http://www.henryschein.es/">www.henryschein.es/</a>	Italy: <a href="http://www.catalogosorriso.it/it/">www.catalogosorriso.it/it/</a>

<p>www.hiperdental.es/ www.inrodent.com/ www.mercadental.es/ www.proclinic.es/ www.quirumed.com/ www.royal-dent.com/ www.rxdental.es/</p> <p>France: www.cycladent.com/ www.dentaltix.com/fr/ www.dsmdentaire.com/ www.fourniture- dentaire.net/ www.gacd.fr/ www.henryschein.fr/ www.occasion- dentaire.com/</p>	<p>www.dentalgreen.it/ www.dental-leader.it/ www.dentaltoday.it/ www.dentaltrety.it/ www.eurodental.it/ www.gerho.it/ www.umbra.it/</p> <p>Portugal: www.douromed.com www.ravagnanidental- portugal.com</p>
---	---

## Author Profile



**González-González, Jesús M.** Ballicher of Medicine, University of Salamanca (1985). Doctor of Medicine and Surgery, University of Alicante (1992). Specialist in Stomatology, University of Murcia (1992). Medical practitioner of State Health Service, 1987-1990. Dentist of State Health Service, 1991-2. Private practice in Stomatology 1991-present. 4 Masters. 10 published books. 58 published manuscripts. 21 reports in congresses. 6 patents. 3 honour mention.