Content available at: https://www.ipinnovative.com/open-access-journals

IP Annals of Prosthodontics and Restorative Dentistry

Journal homepage: https://www.aprd.in/

Review Article

A literature review on techniques of gingival retraction

Neha Nandal[1,*], Dimple Budhiraja[2], Monika Sehrawat[2], S Bharathesh[2], Nasir Ul Sadiq[3], Divya Sharma[4]

[1]*MDS Prosthodontics, Super White Dental Clinic, Sonipat, Haryana, India*
[2]*Dept. of Prosthodontics Crown Bridge and Implantology, Kalka Dental College, Meerut, Uttar Pradesh, India*
[3]*Dept. of Orthodontics, Kalka Dental College, Meerut, Uttar Pradesh, India*
[4]*Dept. of Periodontics, Himachal Institute of Dental Sciences, Paonta Sahib, Himachal Pradesh, India*

ARTICLE INFO

Article history:
Received 06-09-2021
Accepted 08-09-2021
Available online 21-09-2021

Keywords:
Retraction
gingival retraction
Isolation
Dry field
Gingiva

ABSTRACT

For the better out come of the fixed dental prosthesis in terms of periodontal health, in terms of aesthetics and longevity of the prosthesis, a good and proper retraction of the gingival tissue is very much required. For the proper placement of the fixed dental prosthesis over the prepared tooth requires close contact with the adjacent tissue i.e. gingiva, so for the proper and placement of the prosthesis in the close proximity requires adequate isolation and retraction of the soft tissue around the prepared tooth. For the procedure of gingival retraction various methods and different materials are available.

1. Introduction

The periodontal and the gingival factors plays an important role in the functioning of the fixed dental prosthesis in terms of aesthetics as well as longevity of the fixed dental prosthesis. The gingival and the periodontal health should be taken in to consideration for the longevity of the fixed dental prosthesis as the prosthesis is in close contact with the soft tissue. In some of the fixed dental prosthesis cases for the aesthetic reason or for gaining the adequate crown height for the particular tooth or teeth, one can go for sub gingival preparation and have to place the margins sub gingivally, otherwise there could be chances of failure of the restoration.[1–3] In order to record the margins of the prepared tooth, there should be proper and adequate retraction of the soft tissue is required, so that material should flow in the retracted site of the soft tissue and should record the margins properly, so that the fixed dental prosthesis should rest over the margins been prepared over the tooth.

There should be minimum of 0.2 mm of the sulcular width should be there, to avoid the tearing of the impression material while retrieving the impression from the sulcus.[4,5] moisture control is also required while placing the composite restorations.[6]

Before placing margins in the sub gingival region, and before the retraction of the soft tissue for impression making, one should ideally and thoroughly check the gingival health, if the surrounding gingival tissue is healthy and having adequate thickness, one can proceed for the gingival retraction, but in case the health of the gingival tissue is not good and the thickness of the gingiva is not adequate, in this case one should avoid retraction of the soft tissue to avoid unnecessary injury to the gingiva and thus avoiding the placement of the sub gingival margins for the fixed dental prosthesis, in the particular case.[7]

Four directional forces is being applied around the prepared tooth or teeth when gingival retraction is done and these forces are as follows:

* *Corresponding author.*
E-mail address: nehanandal@gmail.com (N. Nandal).

https://doi.org/10.18231/j.aprd.2021.027

1. Downward and the outward force that is exerted over the soft tissue either by the technique of the retraction or by the retraction material.
2. Displacement which is exerted as downward force due to excessive pressure applied during retraction of the soft tissue.
3. Relapse is the third kind of force which is exerted by the gingiva when the gingival tissue is rebounded to its original position.
4. Collapsed force is exerted when the soft tissue is being pressed towards the side of the tooth structure, when excessive force is applied during the impression making. [8–10]

The clinical assessment of the gingival health should be or must be done before starting gingival retraction. The color of the healthy gingiva should be coral pink and it should be firm and resilient with the underlying structure. Contour along with consistency of the gingiva should be evaluated. Consistency of the gingiva should be firm and resilient. There should be no evidence of pain while touching or probing the soft tissue. There should be no or minimal bleeding on probing. Excessive bleeding indicates unhealthy state of the gingival tissue. [11]

1.1. Methods of gingival retraction

There are different methods of retracting the gingiva, the mechanical methods of retracing the gingiva and the chemical method of retracting the gingiva.

Mechanical methods of gingival retraction includes:

1. With the help of wedges and matrix bands. These matrix bands are used when there is need to retract the gingiva when sub gingival restorations are advised to be given. And wedges help in retracting the gingiva in the inter proximal region of the tooth. [11]
2. Copper ring:- This techniques utilizes the use of copper ring with its margins adjusted according to the shape and contour of the gingiva. In this technique the band which is made of copper is filled with impression compound or with the elastomeric impression material and this copper band is placed over the prepared tooth. This methods physically retracts the soft tissue with the copper band and the impression is done by either with the impression compound or with the elastomeric impression material. [12]
3. Retraction caps anatomic: - These retraction caps works on the same principle copper ring. The difference come in only one thing that these anatomic retraction caps are preformed and adjusted over the specific or over the prepared tooth. The patient is advised to bite over the retraction cap, as the patient bites, the retraction cap gets pushed downward and opens the sulcus for the making of the final impression.
4. Retraction cords: - These are the most commonly used physical agents in the retraction of the soft tissue. These retraction cords are available in different sizes that corresponds to the thickness of the gingival cord. According to the fabrication process of the retraction cord they can be knitted, braided or twisted. If the impression cord is already containing medicament in itself which helps in controlling the bleeding, known as impregnated retraction cord. There is specific number being assigned to the retraction cord that started from 000 corresponds to the thinnest most cord, than 00, 0 up to number 3 which corresponds to the thickest cord. [13]
5. Special cord:- A special type of cord is available in the market, that constitutes of thin wire in the center of the cord. That helps in the maintaining the shape of the cord. Once the cord in placed in the gingival sulcus it will maintains its shape due to presence of the thin wire in it.

1.2. Chemomechanical methods of retracting the gingiva

This method employ the use of cord with specific medicament. The cord is being dipped in to the medicament for few time and after than the cord is being placed in the gingival sulcus. Along with the retraction of the gingiva the medicament in which the cord is dipped helps in controlling the bleeding from the soft tissue. Most commonly used medicament are, epinephrine is the most commonly used medicament in chemical mechanical retraction of the gingiva. But now a days the use of epinephrine is reduced. It is most commonly used in the concentration of 8 percent racemic epinephrine. Its use is diminished now a days because some of the adverse affects have been shown by epinephrine when used as a medicament in the cord. Affects like laceration of the soft tissue, nervousness, anxiety told by the patient. [14–16]

Use of astringents have also gained popularity in gingival retraction. They don't only retract the soft gingival tissue but also helpful in controlling the bleeding from the soft tissue. Astringents also helped in reducing the oozing of the crevicular fluid from the gingiva, thus making a clean and dry field for final impression making. Ferric sulfate in the concentration of 15 to 20 percent is most commonly used coagulant. The major disadvantage of the use of ferric sulfate is removal of its smear layer, which is formed when the solution is applied for more than 10 minutes. It also results in sensitivity in some of the patients.

Anther medicament is aluminium chloride which is used in the concentration of 20 to 25 percent. Aluminium chloride was found to be least irritating to the gingival tissue. Another medicament namely zinc chloride helps in haemostasis. It is available in the concentration of 8 percent and 40 percent. Due to its side effect of soft tissue injury

zinc chloride is not used now a days.[17,18]

Newer techniques in gingival retraction are magic foam cord, this is basically a polyvinyl siloxane material, that have the tendency, when placed inside the gingival sulcus swells up and helps in retracting the gingiva along with the use of compression cap.

Epaxyl, is a new material which constitutes of aluminium chloride in 10 percent of concentration along with kaolin in 80 percent of concentration. Kaolin provides the material its paste like consistency that provides its physical properties that helps in retracting the soft tissue and on the same time aluminium chloride acts as haemostatic agent helps in controlling the bleeding during the procedure.

Surgical methods include rotary curettage, in this technique a tapered fissure bur run in the apical region of the tooth, apically from the margins prepared. This results in removing the lateral aspects of the soft tissue. After than a cord is placed in the area created by the bur.

2. Conclusion

Gingival retraction is an important part in the prognosis or longevity of the fixed dental prosthesis. A thorough knowledge of the cord material and medicament is required to gain the adequate retraction simultaneously with the good hemorrhage control.

3. Conflict of Interest

The authors declare that there are no conflicts of interest in this paper.

4. Source of Funding

None.

References

1. Wilson R, Maynard G. Intracrevicular restorative dentistry. *Int J Periodontics Restorative Dent*. 1981;1(4):34–49.
2. Silness J. Periodontal conditions in patients treated with dental bridges. *J Periodontal Res*. 1970;5(3):225–9. doi:10.1111/j.1600-0765.1970.tb00721.x.
3. Knoderer W. Avoiding sulcular hemorrhage during anterior restoration. *Pract Periodontics Aesthet Dent*. 1992;4(2):17–23. doi:10.1111/j.1600-0765.1970.tb00721.x.
4. Baba NZ, Goodacre CJ, Jekki R, Won J. Gingival displacement for impression making in fixed prosthodontics: contemporary principles, materials, and techniques. *Dent Clin North Am*. 2014;58(1):45–68. doi:10.1016/j.cden.2013.09.002.
5. Baharav H, Kupershmidt I, Laufer BZ, Cardash HS. The effect of sulcular width on the linear accuracy of impression materials in the presence of an undercut. *Int J Prosthodont*. 2004;17(5):585–9.
6. Fischer DE. Tissue management: a new solution to an old problem. *Gen Dent*. 1987;35(3):178–82.
7. Sorensen JA, Doherty FM, Newman MG, Flemmig TF. Gingival enhancement in fixed prosthodontics. Part I: Clinical findings. *J Prosthet Dent*. 1991;65(1):100–7. doi:10.1016/0022-3913(91)90059-6.
8. Ruel J, Schuessler PJ, Malament K, Mori D. Effect of retraction procedures on the periodontium in humans. *J Prosthet Dent*. 1980;44(5):508–15. doi:10.1016/0022-3913(80)90069-4.
9. Livaditis GJ. The matrix impression system for fixed prosthodontics. *J Prosthet Dent*. 1998;79(2):208–16. doi:10.1016/s0022-3913(98)70217-3.
10. Lo H, Silness J. Tissue reactions to string packs used in fixed restorations. *J Prosthet Dent*. 1963;13(2):318–23. doi:10.1016/0022-3913(63)90177-X.
11. Thomas MS, Joseph RM, Parolia A. Nonsurgical gingival displacement in restorative dentistry. *Compend Contin Educ Dent*. 2011;32(5):26–34.
12. Benson B, Bomberg T, Hatch R, Hoffman W. Tissue displacement methods in fixed prosthodontics. *J Prosthet Dent*. 1986;55(2):175–81.
13. Bailey JH, Fischer DE. Procedural hemostasis and sulcular fluid control: a prerequisite in modern dentistry. *Pract Periodontics Aesthet Dent*. 1995;7(4):65–75.
14. Shaw D, Krejci RF. Gingival retraction preference of dentists in general practice. *Quintessence Int*. 1986;17(5):277–80.
15. Hansen PA, Tira DE, Barlow J. Current methods of finish-line exposure by practicing prosthodontists. *J Prosthet Dent*. 1999;8(3):163–70. doi:10.1111/j.1532-849x.1999.tb00031.x.
16. Kellam SA, Smith JR, Scheffel SJ. Epinephrine absorption from commercial gingival retraction cords in clinical patients. *J Prosthet Dent*. 1992;68(5):761–5. doi:10.1016/0022-3913(92)90198-j..
17. Bowles W, Tardy S, Vahadi A. Evaluation of new gingival retraction agents. *J Dent Res*. 1991;70(11):1447–9.
18. Gupta G, Kumar S, Rao H, Garg P, Kumar R, Sharma A, et al. Astringents in dentistry: a review. *Asian J Pharm Health Sci*. 2012;2(3):428–32.

Author biography

Neha Nandal, Private Practitioner

Dimple Budhiraja, Post Graduate Student

Monika Sehrawat, Post Graduate Student

S Bharathesh, Post Graduate Student

Nasir Ul Sadiq, Post Graduate Student 3rd Year

Divya Sharma, Post Graduate Student

Cite this article: Nandal N, Budhiraja D, Sehrawat M, Bharathesh S, Sadiq NU, Sharma D. A literature review on techniques of gingival retraction. *IP Ann Prosthodont Restor Dent* 2021;7(3):128-130.