RECENT CONCEPTS IN GINGIVAL RETRACTION

Neeraj Sharma*, Priyanka Makhija*, Rajeev Srivastava, Sanjay Sharma***

ABSTRACT

Introduction of new materials and improved technologies has created new opportunities to attain the goals of prevention and aesthetics in dental practice. For a precision fit and long-term success with fixed prosthetic dental restorations, the quality of impressions taken is a key element of decisive importance. Taking an accurate impression requires appropriate tooth preparation and soft-tissue management followed by proper selection of impression material, system, tray and impression technique. The purpose of this review is to demonstrate the high qualities of new, preventive and improved temporary retraction materials and techniques.

Keywords : gingival management, impressions, aesthetics

INTRODUCTION

One of the most challenging aspects of crown and bridge is management of the gingival tissues when making an impression. Tissue management includes placing the gingival tissues away from the preparation margins so they can be impressed, combined with providing haemostasis when the gingival tissues are susceptible to bleeding.[1, 2]

The rationale for tissue management is a critical aspect of impression making, whether the impression is made with conventional impression material or by a digital impression technique so that all tooth preparation margins are captured in the impression to assure an excellent marginal fit of a laboratory fabricated restoration.[1, 3]

For the retraction of soft tissue, three principal methods are available in use today:

1)mechanical 2)chemo-mechanical 3) electrosurgical.

*Senior Lecturer,**Professor, Modern Dental College & Research Centre, Indore.

The chemo-mechanical technique is probably the most widely used but it has certain limitations which include its time consumption, pain, need for local anaesthesia, injury to epithelial tissue and gingival recession.

To overcome these limitations, various newer retraction systems are introduced - Expasyl, Magic foamcord and Gingitrac.

A.) MAGIC FOAMCORD (COLTENE/WHALEDENT)

Magic FoamCord is reportedly the first expanding vinyl polysiloxane material designed for retraction of the gingival sulcus without potentially traumatic and time-consuming packing of retraction cord. It is a non haemostatic cordless retraction system and consists of foam and cartridges, mixing and intraoral tips, and comprecaps available in three sizes[4] (Figure 1).

MODE OF ACTION:

Main mode of mechanism is by expansion of silicone foam. When comprecap is used to apply pressure, the expansion of magic foamcord occurs in the sulcus.

Figure 1

TECHNIQUE:

• Select and pre-fit one Comprecap anatomic for each preparation.

• Apply Magic FoamCord around the preparation by syringing. An application in the sulcus is only necessary where there is a deep sub-gingival preparation margin.

• Do not force the material into the sulcus under pressure and avoid sudden movements.

• Place Comprecap over preparation. Ask the patient to bite down for 3 -5 minutes (Figure 2).

Figure 2

• This procedure makes optimal use for the formation of foam (i.e., the expansive effect of the silicone foam). Due to the counter pressure of the Comprecap, the expansion of the Magic FoamCord occurs in the sulcus.

• After proper setting, remove the Comprecap anatomic and Magic FoamCord in one piece.

• Always check that the Magic FoamCord material has set in the mouth before removing it.

ADVANTAGES:

• Non-traumatic, conservative method of temporary gingival retraction

• Easy and fast application directly to the sulcus without pressure or packing

• Extensive rinsing is not required due to absence of haemostatic chemicals that could contaminate impression site.

• Adequate working time

B.) EXPASYL (KERR)

Initially described by P. Lesage, a French dental surgeon, a new product of gingival retraction, which was first known as "PRG paste", was launched in 1999 by the Pierre Rolland laboratory under the name of EXPASYL (Figure 3).

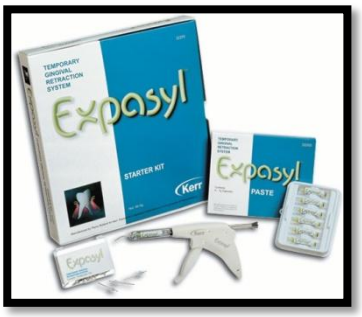

Figure 3

Expasyl is a universally accepted and widely used gingival retraction paste. It is composed of three materials: Aluminum chloride (≈ 15 %), Kaolin and Excipient. Depending on the clinical situation and number of teeth, four to ten preparations can be performed with a single capsule.[5]

According to Mahmoud Kazemi, gingival retraction with expasyl paste method caused less injury to gingival tissues than impregnated cord, while both provide gingival retraction.[6]

MECHANISM OF ACTION:

It has both mechanical and chemical action. It creates and maintains space in the

sulcus due to optimal characteristics of its viscosity which is mainly due to its kaolin component. It achieves haemostasis due to aluminium chloride. Time taken for retraction is 2 minutes and sulcus widening achieved is 0.5mm.

TECHNIQUE:

The paste is thick, firm, and viscous to enable easy and quick tissue displacement, and aluminum chloride controls bleeding simultaneously. It is injected directly into the gingival sulcus (Figure 4) from a pre-loaded syringe at a recommended rate of 2 mm per second, using non-damaging pressure of 0.1N/nm.

Figure 4

If necessary, this can be followed by gently tamping on the paste with a plastic instrument or cotton pellet to ensure the paste is fully in the sulcus. The paste is left in the sulcus for one to two minutes if the tissue is thin, or three to four minutes if the soft-tissue is thicker. This pressure is sufficient to obtain a sulcus opening of 0.5mm for two minutes.[7] After this time, the sulcus will be expanded, and the paste should be removed by gently rinsing and then drying the site prior to impression. It is important to rinse thoroughly and verify that Expasyl is totally removed from the sulcus as residue of the ingredient, aluminum chloride, may inhibit set of polyether impression materials.[8]

ADVANTAGES:

• Physically displaces tissue for good marginal access.

• Safe minimal pressure required and no danger of rupturing epithelial attachment.

•Minimal time and force needed compared with packing cord.

• Controls bleeding and crevicular seepage

C.) GINGITRAC (CENTRIX)

GingiTrac uses a pre-loaded syringe to apply the paste around the margins (Figure 5). The paste contains an astringent, and if necessary a haemostatic agent can be applied prior to the application of GingiTrac.

Figure 5

TECHNIQUE:

For single tooth use, a GingiCap is used to apply pressure for up to 5 minutes after the paste has been applied (Figure 6). The cap is first filled with the paste, then placed over the tooth and the paste is syringed around the margins. For multiple tooth preparations, a plastic tray is first used with a firm paste matrix over which the GingiTrac paste is syringed before the tray is placed over the arch and held in position for 3-5 minutes. For both single tooth and multiple tooth preparations, gingival retraction is achieved through the application of pressure prior. The paste is removed prior to making of an impression.

ADVANTAGES:

• Works in less than 5 minutes

• Gently retracts the gingiva with no tissue trauma

• Contains mild, natural astringent to control bleeding

• Auto-mix gun system mixes and delivers GingiTrac

• Works on single crowns or multiple crown preparations

• No clean up is required

Figure 6

CONCLUSION

Atraumatic gingival tissue management for impression making provides greater patient comfort during and after impression making. During restorative procedures, it is incumbent upon clinicians to consider the advantages and limitations of each method in individual case and patient, and to strive for minimally invasive methods that optimize the procedural site for impression making and restoration placement.

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CORRESPONDING AUTHOR

Dr. Neeraj Sharma
(Sr. Lecturer)
Dept. of Prosthodontics
Modern Dental College and Research Centre Opp. Gandhinagar, Bijasan road, INDORE (M.P.) – 453112
Email id- drneeraj22@gmail.com
Phone no- 9981071001