Expa-syl:

A new form of "tissue retraction" that is quick, painless, atraumatic and cost effective.



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Introduction

Proper prosthodontic treatment involves careful execution of diagnostic and clinical procedures. Once intra-oral preparations are complete, an impression is made to accurately capture a negative imprint of the prepared teeth and the surrounding tissues. A poor impression leads to an inaccurate master cast, which in turn leads to a non-fitting restoration. The impression making process is composed of several steps that are required to produce an impression that is both detailed and accurate.

A vital component in "classical impression making" is retraction of the gingival tissues. This step is important since it exposes the prepared margin and unprepared tooth structure to the impression material. The classic method for tissue retraction involves using retraction cords. These cords vary in diameter and may be impregnated with different haemostatic agents. The cords are placed into the gingival sulcus to physically retract the tissues and leave the prepared tooth margin exposed to the impression material. Retraction cords must stay in place for a prescribed length of time (10 minutes on average) to be effective.

The use of retraction cord has several negative effects.

1. Placement of the cord is very time consuming. When making an impression of multiple abutments, a significant amount of time (several minutes per abutment) may be spent positioning the cord properly.
2. Retraction cord placement is uncomfortable and usually requires local anaesthesia.
3. Retraction cord may be left in place much longer than suggested when an impression is being made of multiple abutments. This may increase the potential for tissue damage, post-op discomfort and gingival recession.
4. Removal of retraction cord in advance of impression making may disturb the gingival tissues and cause them to bleed. Conventional impression materials require a relatively dry field to accurately "impress" the preparation.

Since gingival margin exposure (classically done with retraction cord) is a necessary component of the impression making process, it would be of great benefit if it could de done with the following criteria in mind:

TABLE I

EXPA-SYL FORMULATION	
Kaolin	66.75%
Aluminum chloride	6.54%
Water	25.36%
Oil of lemon	0.33%
Colorant	1.02%
pH =	~ 3

1. Minimal or no physical damage to the gingival tissues,
2. Can be accomplished quickly in situations where multiple teeth are being impressed,
3. Cost effective, and
4. Predictable haemostasis is achieved.

A new product has been introduced to the North American market that adheres to these criteria. Expa-syl (Kerr Corporation, Orange, CA) is a clay like material that is dispensed from a syringe apparatus through a narrow needle like tip (Table 1). The material is packaged in vials that are loaded into the syringe and dispensed directly into the sulcus (Fig. 1). Expa-syl has no chemical or setting reaction. It does not go through an expansion phase and as such it is important to place the material directly into the sulcus. The material is left in place for up to two minutes and is then rinsed off with an air/water syringe. The sulcus then appears distended and is ready for the impression. The material contains aluminum chloride, which acts as an effective haemostatic agent and since no violation occurs to the gingival complex, recession is not encountered.

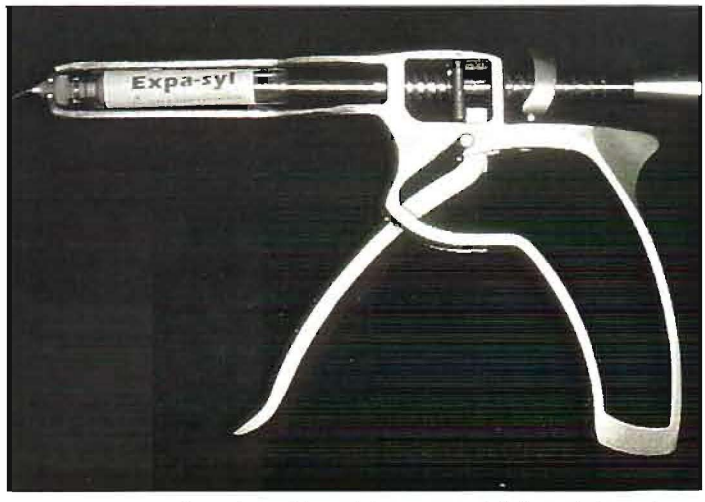

Fig. 1 - Expa-syl is packaged in a vial system and delivered through a needle tip and heavy duty delivery gun.

The uses for this dental product include:

- Impressions in the anterior esthetic zone where minimal soft tissue manipulation is desired,
- Impressions of single or multiple abutments in any region of the mouth,
- Impressions of implant abutments where a cemented restoration is planned and tissue retraction is needed, and
- Tissue retraction and haemostasis in advance and in preparation for cementation or other restorative procedures.

Clinical Case

A 55-year-old male patient presented requesting that his maxillary central incisors be veneered. After a minor gingivectomy procedure, the teeth were prepared for porcelain veneers (Fig. 2). Retraction was achieved using Expa-syl placed into the buccal gingival sulcus (Fig. 3). To ensure that the material was directly placed into the sulcus, a dry cotton swab was used to "pack" the material on the buccal aspect of the tooth (Fig. 4a and 4b). A plastic instrument was then used to ensure that the Expa-syl was in the interproximal sulcus (Fig. 5a and 5b). Expa-syl was left in position for two minutes before being removed with an air/water spray. Gingival retraction was visualized (Fig. 6) and an impression was made using a polyether impression material. Two porcelain veneers were fabricated and tried in for fit and esthetics. In advance of cementation the sulcus was once again retracted with Expa-syl. The veneers were cemented in place with Nexus II cement (Kerr Corporation, Orange CA).

Discussion

This case illustrates the simple use of Expa-syl. Access to the impressed region was easy and the Expa-syl syringe had direct access to the sulcus. To ensure direct placement of the Expa-syl directly into the sulcus, a dry cotton swab can be used to pack the material into the sulcus (Fig. 4a and 4b). Interproximal areas can be accessed using a plastic instrument to direct the placement of Expa-syl (Fig. 5b). These additional procedures take no more than several seconds per tooth.

On occasion, when there may be a shallow sulcus present, it may be difficult to place the Expa-syl into the sulcus. Directing a blast of air into the sulcus can assess the space for Expa-syl. If the sulcus can be seen clearly, then Expa-syl can be used effectively. If the sulcus is not visualized, an ultrasonic scaler may be used to gently enlarge the sulcus. If bleeding is minor, Expa-syl can then be used directly. If bleeding is more profuse due to inflammation or overzealous instrumentation, an application of a topical haemostatic agent is effective in advance of the Expa-syl application.

The key to placement of Expa-syl is the direct placement of the material into the sulcus. The material does not flow and stays where it is placed. This is easiest to accomplish in the maxillary anterior area since the area is easily accessed. When the material is used in the lingual or interproximal sulcus, or in a more posterior location, the procedure becomes more challenging because of access difficulties.

The key to placing the material is to place the tip of the syringe directly over top of the sulcus. This placement ensures that the material goes directly into the sulcus. When the material does not go

Fig. 2 – Tooth preparation is complete and retraction is now needed.

Fig. 4a –A dry cotton swab is in position to "pack" the Expa-syl into the buccal sulcus.

Fig. 3 – Expa-syl has been dispensed into the buccal sulcus.

Fig. 4b – Expa-syl has been packed using direct pressure from the dry cotton swab.

directly into the sulcus, the material curls up on itself as it is being dispensed from the syringe. When directing the material in the posterior part of the mouth, many times this occurs due to access problems. The material may still be pushed to place using a cotton swab (buccal and lingual) or a plastic instrument (interproximal).

The resulting impression gives full detail of the preparation and the margin itself. It does not have a large amount of excess impression material beyond the margin but has enough extension so the technician can easily read the margin (especially if a microscope is used during the die trimming procedure). This reduced amount of

Fig. 5a – In the interproximal region, a plastic instrument is used to push Expa-syl into the sulcus.

Fig. 5b – The Expa-syl has been packed into the interproximal sulcus.

Fig. 6 – Gingival retraction is visible and the preparations are ready for impression making.

Fig. 7a – Three Gingihue posts (3I- Implant Innovations, West Palm Beach, FL) are in position and the tissues around them need to be retracted in preparation for impression making.

Fig. 7b – Expa-syl has been dispensed and packed with a dry cotton swab.

Fig. 7c – The retracted tissue can be seen and the implant abutments are now ready for impression making.

Fig. 8a – After removal of the interim restoration, the gingival tissues appear inflamed. Difficulties are encountered when moisture control is attempted in preparation for cementation.

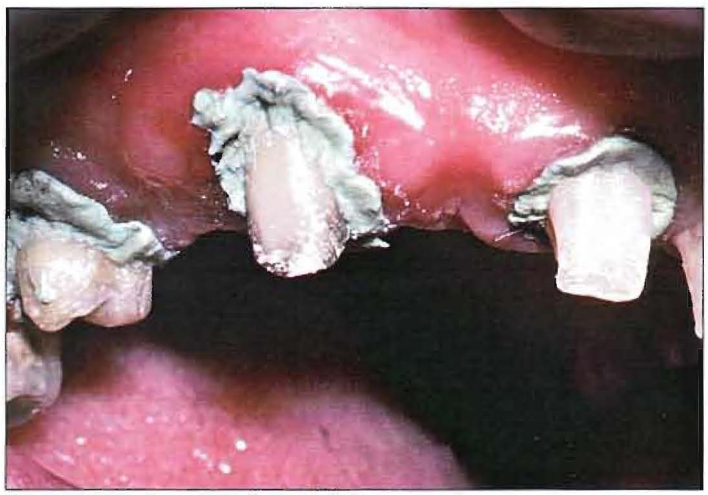

Fig. 8b – Expa-syl has been positioned around the abutments and packed in place with a dry cotton swab.

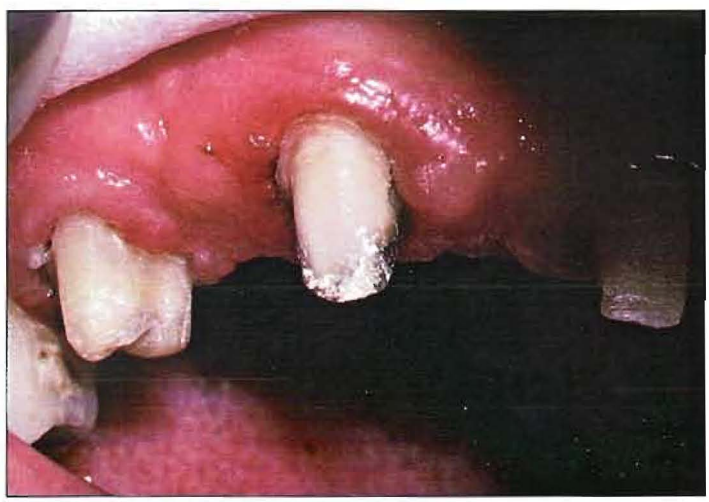

Fig. 8c – The tissue "seepage" has been controlled and the margins of the restoration are visible for cementation.

impression material (beyond the prepared margin) also allows for multiple pours of the impression since there is no tearing or distortion of the final impression when it is poured.

Making impressions of implant abutments in preparation for cemented restorations is difficult since one still needs to capture the margin of the abutment (subgingival) but one does not have a classic sulcus to work with. When placing retraction cord into a gingival sulcus (around a natural tooth) there is resistance to the placement pressure due to the orientation of the gingival fibres. In an implant situation, placement of cord is not resisted and one can easily place an excessive amount of cord around the implant abutment. When the cord is removed, the implant sulcus collapses very quickly as well. Using Expa-syl in this clinical situation allows for a minimum amount of material to be placed with little or no damage being caused. There is just enough gingival tissue distension to allow for an accurate impression to be made of the implant abutment without risk of tissue damage and recession (Fig. 7a, 7b, 7c).

Final cementation of a fixed prosthesis requires a dry field. If gingival health is not ideal; "weeping tissue" may make it difficult to adequately isolate the abutment teeth in preparation for cementation. Expa-syl may be used in advance of cementation to control gingival crevicular flow and provide a dry field for final cementation (Fig. 8a, 8b, 8c).

One of the wonderful benefits of using Expa-syl is that "retraction" no longer needs topical or local anaesthetic. Implant impressions that require retraction and restoration of endodontically treated teeth can be accomplished quickly without the uncomfortable side effects of anaesthesia.

Mastering the use of Expa-syl takes time but once accomplished, a significant timesaving is realized in the overall impression making process. This time saving makes the material very cost effective.

Conclusion

Every so often a material is introduced to the dental practice that makes a significant difference to the way we practice clinical dentistry. Since Expa-syl was introduced to our practice, it has proven to be an extremely valuable component of the impression making process. The principal author of this paper (IB) has used Expa-syl exclusively since March 2001 and has not found a need to use retraction cord *at all* since Expa-syl was introduced. Final impressions are detailed and accurate and multiple pours are always possible.

There has been a reduction in the perceived rate and degree of soft tissue recession and patients prefer Expa-syl to retraction cord since there is no post-op soft tissue sensitivity and no need for local anaesthesia. Clinically, the most significant effect is the timesaving especially when multiple teeth need retraction. Any new technique requires learning and practice. The time spent on this dental product is well worth it.

About the authors

Dr. Barzilay is currently Head—Division of prosthodontics and restorative dentistry at Mount Sinai Hospital in Toronto, ON, Assistant Professor (part time), University of Toronto, Faculty of Dentistry, Toronto, ON, and maintains a private practice limited to prosthodontics and implant dentistry.

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