Gingival Retraction Using Paste Systems

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An accurate traditional or digital impression is essential for the precision fit of the permanent indirect dental restoration. Although the use of intraoral digital scanners will inevitably replace using physical impression materials the majority of dental practitioners today are still taking polyvinyl or polyether impressions. These materials begin in a fluid state, are placed in an impression tray and then molded over the oral structures to be reproduced. The fluid impression material is converted through chemical polymerization into a firm negative replica of the architecture of the dentition. This impression can then be poured into a high strength stone model duplicating the oral structures.

Times change and so do technologies. We are living in the digital age and with ever improving sophisticated computer hardware and software, an ever increasing number of practitioners are scanning their intraoral preparations digitally. Just a short time ago the world of photography changed almost overnight. Traditional film cameras quickly became obsolete and digital photography became the new standard. Conventional dental impressions will inevitably suffer the same fate and digital scanning will be the new norm. However, no matter what type of impression technique a dentist chooses it is important to work with a standard protocol to consistently achieve exceptional results.

RETRACTION
In order to take accurate impressions, we must be able to visualize the margins of our preparations clearly. Effective gingival retraction is required to open a space surrounding the preparation margin and leave a clean dry field in which to take the impression. If our margins are supragingivally located, capturing them is relatively simple. However, much of the time, the margins are placed subgingivally beyond the presence of existing large restorations or below the gingival crest, for esthetic reasons. A clear dry field, free of blood is the most important element necessary to obtain a good impression. Sulcular bleeding must be controlled prior to taking the impression. Adequate retraction must be accomplished in all subgingival areas to guarantee that the impression material or digital scan registers beyond the preparation...it is important to work with a standard protocol to consistently achieve exceptional results.
Several different methods of retraction are in use today, the most popular of which are 1) cords 2) laser or electrosurge 3) paste systems.

Retraction cord has historically been the most popular system. Various size cords containing or soaked in haemostatic agents can be packed into the gingival sulcus. When the cords are subsequently removed, the dentist is provided with an open space for the impression material to capture the detail of the finish line of the preparation. However, using retraction cord is technique sensitive, time consuming and sometimes uncomfortable for the patient. Care must be taken not to rupture the epithelial attachment so as not to cause irreversible tissue damage and possible bone resorption.

**Paste Systems**

Dentists today desire “smart” products designed to make their jobs faster and easier. In recent years several retraction paste systems have entered the dental marketplace, claiming to be convenient, fast and effective. Providing a proper technique is followed these products are simple to use and can be gentler than cord to the gingival tissues. All the currently available paste systems have a very similar placement protocol. A specially designed tip is placed vertically into the gingival sulcus, mechanically retracting the tissue. Slowly and steadily a paste is then injected to completely fill the sulcus. The paste can be used alone or together with cords, cotton pellets or specialized caps to aid to pack it into the sulcus and keep the field dry. After approximately two minutes the paste is completely removed with air-water spray leaving a clean, dry preparation and a clearly visible margin. It is essential to thoroughly rinse off all the paste as if it remains may cause burning to the tissue. Care must also be taken when using any form of retraction in areas of thin gingiva.

**Expasyl** (Kerr) was developed in France by Pierre Rolland Acetion Labs and was the first paste system introduced as an alternative to using retraction cord and special haemostatic agents. Expasyl is a clay like material containing 15% aluminum chloride as the haemostatic agent. It was designed to be slowly injected with a special gun into the sulcus of the tooth creating a dry clear opening between the margin of the tooth preparation and the gingival tissue (Fig. 1). The clay like material can be aided into the gingival sulcus by compression using cotton pellets.
or specially designed caps which are available from several manufacturers. An accurate conventional or digital impression can then be captured. Expasyl has the firmest consistency of all the different available paste systems. Expasyl has undergone several refinements over the past few years and is now also available with strawberry flavoring and in foil packages designed to prevent it from drying out.

Several other products have subsequently been introduced to the dental marketplace such as Racegel (Septodont), Traxodent (Premier), GingiTrac (Centrix), Access Edge (Centrix) and most recently Astringent Retraction Paste. (3M ESPE) These materials all contain aluminum chloride for haemostasis and all claim to provide blood free retraction making capturing an accurate impression easy, simple and predictable.

Each system uses slightly different delivery systems, have different consistencies and may include specially designed accoutrements to aid in getting the material into the sulcus and keeping the tissue dry. Undoubtedly several new materials and delivery systems will become available as dentists discover the many uses for types of products.

Traxodent (Premier) contains Hemodent (Premier) as well as 15% aluminum chloride and is very easy to use as it is dispensed from traditional convenient syringes. It does not require a special delivery system. The Traxodent paste flows easily and produces gentle pressure to the sulcus (Fig. 2). Traxodent can be combined with cords for dentists who follow this technique. The Traxodent system includes Premier Retraction Caps (Fig. 3) an anatomically stiff cotton roll-like adjunct which places physical action on the tissue and guides the material into the sulcus (Fig. 4). The stiff cotton cap also absorbs fluid, aiding in achieving haemostasis. These caps are easy to use and available in three anatomic forms. I would recommend using them for any of the paste systems.

Racegel (Septodont) is a flavored gel like product containing 25% Aluminum chloride. It exhibits thermosetting properties being liquid at room temperature and turning into a gel when placed in contact with the oral tissues (Fig. 5). It’s strong haemostatic action
makes it useful for gingival scaling and other situations where gingival bleeding may inhibit the procedure. Although some practitioners may feel that it does not provide sufficient retraction, it is an excellent material to be used in combination with retraction cord or gingival troughing.

GingiTrac is a creamy, flowable vinyl polysiloxane based material dispensed from a DS50 1:1 mixing gun (Fig. 6) or in a new unit dose mini mix format. The system includes styrofoam like GingiCaps which can also be filled and placed back over the preparation. Centrix suggests having the patient close down on the GingiCap and wait three to five minutes before thoroughly rinsing the material off. These foam caps adapt well to the shape of the tooth and compress the paste material efficiently. Centrix also offers Access Edge a clay based material that is very similar to Expasyl.

Recently 3M ESPE has introduced their Astringent Retraction Paste, containing 15% aluminum chloride, which offers several improvements over other delivery systems. The material is dispensed in hygienic unit dose capsules that are compatible with most composite dispensing guns. It’s placement tip is finer than those of the other systems and has a soft edge tip giving easy access to the sulcus (Fig. 7), especially in interproximal areas (Fig. 8). The capsules have optimized geometry for easy placement and like a periodontal probe have a ring marking aiding in the depth of placement. Like all the other systems 3M ESPE Astringent Retraction Paste can be aided into the sulcus with a cotton pellet (Fig. 9) or a retraction cap (Fig. 10) leaving the material evenly dispensed (Fig. 11). After being in place for two minutes the retraction paste is completely removed with an air-water spray (Fig. 12) yielding a clear, fluid free margin (Figs. 13–15).

Retraction paste systems are a most valuable tool to add to our daily armamentarium. Many dentists are resistant to change. Often it may take several years for a dentist to modify their technique or adapt to a new material. One must realize that there is a learning curve to any protocol change. It is extremely important to follow the manufacturers instructions to obtain optimum results. Often we do not use materials as intended and hastily conclude that they are no good.

Every dentist has their own individual preferences on how they work and what materials they use. Materials are simply a means to an end. Whatever works best in your hands! Materials should adapt and enhance your technique. Some practitioners combine retraction paste with cord, use fine gingival curetage to trough around the preparation or use the paste alone to open the sulcus. There is no right or wrong way! However once a dentist has adapted a retraction paste system to their individual technique it is doubtful that they would not find it most valuable.

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Oral Health welcomes this original article.