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GINGIVAL PACK

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3 Claims. (Cl. 167—60)

The present invention concerns the retraction of gingival tissue in the practice of dentistry, and more particularly relates to an improved gingival pack for this purpose and the method of preparing the same. This application is a continuation of my copending application Ser. No. 606,553, filed Aug. 28, 1956, now abandoned.

Normally, in order to obtain an accurate impression of a tooth or to expose an area thereof for dental restoration, it is necessary to retract or pull from the tooth the surrounding gingival tissue. In the past many dentists have used electric cautery or caustics in concentrated solutions for this purpose. However, these are objectionable because they destroy tissue which sometimes does not grow back, and, when handled by an inexperienced operator, may result in the tissue becoming severely damaged.

As a result of these objections, I developed the use of a concentrated vasoconstricting agent such as racemic epinephrine for the retraction of gingival tissue. Such an agent will shrink tissue and control seepage and bleeding. Some dentists, to facilitate the application of the vasoconstrictor, have saturated a yarn or string with it which they then loop around the tooth and pack into the sulcus. Thus they provide a gingival pack.

Such a pack has been considered an improvement over the prior practices discussed above, but nevertheless has met with certain objections. Because of being wet it is somewhat difficult to handle and much of the vasoconstrictor is often washed away before the dentist can get the pack in proper position. Furthermore, the amount of vasoconstrictor in the pack is not accurately controlled. Accordingly, the present invention aims to provide an improved gingival pack which will substantially eliminate these objections.

As still further objects the invention aims to provide an improved gingival pack which will act more quickly and which will have antiseptic qualities.

The above and still additional objects and advantages in view will appear and be understood in the course of the following description and claims.

In its finished state my improved pack has dry cotton fibres evenly impregnated to a predetermined amount with epinephrine hydrochloride crystals, and in addition, I prefer that it also have an even dispersion of zinc sulphate crystals. While preparing such a pack steps must be taken to insure that the epinephrine does not oxidize because the oxidized product is inert. Accordingly, the epinephrine must be worked rapidly while in solution since in this state it is readily oxidized.

An 8:100 epinephrine aqueous solution has been recognized as desirable and so the example given hereinafter gives approximately this concentration although it will be appreciated that other concentrations can be obtained by varying the proportions of ingredients while still using

my preferred process for preparation, the ingredients for which are as follows:

Pure racemic epinephrine crystal ($C_9H_{13}O_3N$)	gms..	100
Zinc sulphate	gms..	60
Chlorobutanol	gm..	0.5
Alcohol	cc..	1100
Water	cc..	65
Hydrochloric acid, C.P.	cc..	45

The hydrochloric acid is first mixed with the alcohol to give an acid solution with a pH of from about 3 to 3.5. For reasons of economy and availability I normally prefer to use methanol as a choice of alcohol, but since, as will later appear obvious, the alcohol is used because of its fast drying characteristic, any alcohol is satisfactory. After the pH has been checked the epinephrine crystal is added to the acidified alcohol vehicle and the pH is again checked. To avoid an unstable epinephrine condition, in no case should the pH numerically exceed 4.0, and so in some instances it may be necessary to add a drop or so of acid to keep the pH below this limit. There is no particular lower limit of pH with which to be concerned in this particular case.

The chlorobutanol functions as a stabilizing agent and soldium hydrosulphite functions as well for this purpose with a quantity as small as 0.1 gm. In either case an aqueous solution is made of the agent and the zinc sulphate by the use of the indicated quantity of water. This aqueous solution is then combined with the acidic epinephrine solution and the pH should then be again checked.

As a pack base material I prefer to use a two-ply medium cotton yarn. Such is wetted with the combined solution by repeatedly passing the solution over the yarn in a vacuum filter until the yarn is thoroughly impregnated and any surplus solution is exhausted. In this regard I control the degree of saturation so that approximately 100 cc. of solution are absorbed by 200 yds. of the cotton yarn. The wet yarn is then dried immediately in a dry steam sterilizer under vacuum and heat which must be less than 200° C. to avoid decomposition of the epinephrine. This drying is considerably speeded up because of the use of the acidified alcohol as a vehicle instead of acidified water. When the alcohol and a relaticely small amount of water have evaporated the fibres of the dried yarn have become uniformly impregnated, as afore-mentioned, with racemic epinephrine hydrochloride crystals and zinc sulphate crystals. The yarn will still be soft and pliable for easy and effective handling.

To perform gingival retraction with my impregnated yarn the dentist need only pack it into the sulcus. A preferred technique is to cut two lengths of the yarn long enough to loop around the tooth with a slight overlap and then separate one length into single strands. One of these strands is twisted tight into a cord, and after being looped around the tooth at the crest of the gingiva, is gently tucked down and behind the shoulder of the gingiva with a suitable serrated instrument. This small but firm cord-like pack effectively and safely breaks the gingival seal and can be readily manipulated to deep, full contact with the sulcus. As a result, the tissue is forced away from the tooth as distinguished from being depressed. The second, two-strand length is next looped over the crevice created by the first length and packed

into position. This, in effect, creates a V-wedged pack which provides conservative mechanical aid as normal tissue moisture dissolves and thereby activates the shrink-ink action of the chemicals in the yarn. In this regard, the amount of epinephrine in the yarn has been so controlled during the processing of the pack as afore-described that the cotton will have absorbed sufficient fluid in the mouth by the time the epinephrine crystals are dissolved by such fluid to give a maximum epinephrine concentration of the desired amount.

The vasoconstricting action of the epinephrine is supported by the astringent effect of the zinc sulphate to the end that bleeding is retarded and the tissue is quickly retracted. It is recommended that my pack be left in place about three minutes for best results. In this regard, since the pack is non-escharotic, it can be left in place without fear of causing tissue injury. As a general rule, when the pack has taken effect it is removed thereby exposing free margins of preparation so that the tooth area can be sprayed, isolated and blown dry for ready and poistive accessibility of impression material. However, it will be appreciated that in some cases it may be preferred to complete impression or restoration with the first or small pack in place.

It is thought that the details of the invention will have been clearly understood from the foregoing description. Minor changes may be resorted to without departing from the spirit of the invention, wherefor it is my intention that no limitations be implied and that the hereto annexed claims be given a scope fully commensurate with the broadest interpretation to which the employed language admits.

What I claim is:

1. A gingival pack for the retraction of gingival tissue around a tooth comprising a length of dry, soft and pliable cotton yarn having its fibers uniformly impregnated with crystals of racemic epinephrine salt and adapted to be packed in the sulcus between the tooth and the surrounding gingival tissue.

2. A gingival pack for the retraction of gingival tissue around a tooth comprising a length of dry, soft and pliable two-ply medium cotton yarn having its fibers uniformly impregnated with racemic epinephhrine hydrochloride crystals and adapted to be packed in the sulcus between a tooth and the surrounding gingival tissue.

3. A gingival pack for the retraction of gingival tissue around a tooth comprising a length of dry, soft and pliable cotton yarn having its fibers uniformly impregnated with racemic epinephrine hydrochloride crystals and zinc sulphate crystals and adapted to be packed in the sulcus between a tooth and the surrounding gingival tissue.

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