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REVIEW ARTICLE

PERIODONTAL DRESSING

Dr. Bhusari, B. M., Dr. Mahajan Ridhima Vijay, *Dr. Suthar Namrata Jayesh and
Dr. Rajbhoj Shubhangi Raosaheb

Department of Periodontology, Y.M.T Dental College and Hospital, Kharghar, Navi Mumbai, India

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ABSTRACT

Periodontal dressings were first introduced by Dr. A.W Ward in 1923, who suggested the use of periodontal dressing following periodontal surgery. Periodontal dressings are now widely used for various purposes by periodontists, although some controversy exists regarding the necessity of their application following periodontal surgery. They can broadly be categorized as eugenol-based dressings and noneugenol dressings. Over the years, many modifications have been made to the composition of such dressings to improve their physical and therapeutic properties. Controversies surrounding the rationale for their use, advantages and disadvantages of the most commonly employed periodontal dressings and their current status in clinical practice are described in this comprehensive review.

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INTRODUCTION

A surgical dressing is a material which is applied over and protects the surgical wound created by periodontal surgical procedures (Sachs *et al.*, 1992). Prior to introduction of the first periodontal pack by Dr. AW Ward in 1923, surgical eradication of periodontal disease was accompanied by the undesirable sequelae like pain, hemorrhage, unsatisfactory control of granulation tissue and sloughing. In some cases use of periodontal dressing is really beneficial. Protecting the wound from mechanical trauma and stability of the surgical site during the healing process are among the most important advantages of periodontal dressing application after surgery.

Controversy on terms pack or dressing

Both names can be used interchangeably. At one stage in the development of periodontal therapy a packing material was used therapeutically to help eliminate the periodontal pocket. Thus at that time the term pack was used. With the advent of modified surgical techniques for pocket elimination and use of postsurgical dressing to cover the exposed wound surface the term periodontal dressing is more appropriate and is found more commonly in literature (Linghorne *et al.*, 1949).

Properties of dressings (Sachs *et al.*, 1984 and Muthukumarasamy, 2012)

- The dressing should be soft, but still have enough plasticity, and flexibility to facilitate its placement and adaptation.
- Setting of the dressing should be within reasonable time.
- After setting, the dressing should have sufficient rigidity to prevent fracture and dislocation.
- It should have a smooth surface after setting to prevent irritation to the mucosa, cheeks lips.
- It should have bactericidal properties and prevent excessive plaque formation.
- It should not interfere with healing.
- It should not induce allergic reaction.
- It should have acceptable taste and odor. (Baer *et al.*, 1969).

History and purpose of periodontal dressing

- Bernier and Kaplan 1947- stated the primary purpose of dressing was wound protection constituents are of secondary importance. Ariaudo and Tyrell 1957- dressing to position and stabilize apically positioned flap. Blanquie 1962- dressing to control post-operative bleeding, decrease discomfort, splint loose teeth, allow tissue healing, prevent reestablishment of pocket and desensitize cementum.

*Corresponding author: Dr. Suthar Namrata Jayesh,
Department of Periodontology, Y.M.T Dental College and Hospital,
Kharghar, Navi Mumbai, India.

Baer *et al* (1969) - primary purpose of dressing was

1. To provide patient comfort and
2. To protect the wound from injury during healing,
3. To hold a flap in position after it has been sutured or
4. To immobilize a gingival graft by dissipating the pull from alveolar mucosa and lip. The dressing should not be used:

- A) To control postoperative bleeding.
- B) To splint the teeth. This should be performed before the surgery.

Functions of periodontal dressings (Sachs and Farnoush, 1984)

- A periodontal dressing provides mechanical protection to the wound thereby facilitating healing but by itself it has no curative properties.
- It enhances patient comfort by isolating area from external injuries or irritation for example- from tongue during mastication, contact with hot and spicy food.
- It maintains surgical area free of debris.
- It prevents postoperative bleeding by maintaining the initial clot in position.
- Helps maintain position of repositioned soft tissues.
- Acts as template to prevent formation of excessive granulation tissue.
- Protect newly exposed root surfaces
- Protects sutures from getting entangled with the food particles.

Types of periodontal dressings

Generally classified into three types: Hall 2003:

- 1) Zinc oxide eugenol dressings
- 2) Zinc oxide non eugenol dressings
- 3) Those containing neither zinc oxide nor eugenol like:
 - a. Cyanoacrylates
 - b. Tissue conditioners
 - c. Dressings which contain antimicrobial agents
 - d. Photo curing periodontal dressings.

Zinc oxide eugenol dressings (hard packs)

It exists in two forms : A) Powder and liquid form (Kirkland pack) B) Paste form i) Impression paste ii) As a Periodontal Dressing-Ward's Wondr-Pak

WARD'S WONDR- PAK Periodontal Dressings were first introduced in 1923 when Dr.A.W.Ward advocated the rules and use of packing material around the teeth following surgery. This material was called Wondrpak. Manufactured by: Westward Dental Products Co., San Francisco, Ca, USA

Powder

- a. Zinc Oxide- Resin- improve setting
- b. Tannic acid-improve setting
- c. Cellulose fibers-improve setting
- d. Zinc acetate – accelerator, better working time.

- e. Asbestos – binder and filler

Liquid– Isopropyl alcohol (10%), clove oil, resin, pine oil, peanut oil, camphor and coloring agents.

Setting reaction (Sachs and Farnoush, 1984)

When the components are mixed zinc oxide and eugenol react to form Zinc Eugenolate. The set material consists of free eugenol which increases in amounts as the zinc eugenolate decomposes. (Molnar 1967).

Disadvantages

- 1) According to Radden 1992 – Free eugenol causes marked inflammation, delayed healing, tissue necrosis.
- 2) They leave a bad taste in patients mouth.
- 3) Romanow 1967 reported contact allergy to eugenol and rosin. Pulsion– reported an anaphylactic reaction after application of eugenol containing dressing
- 4) Asbestos was found to have the potential for causing asbestos lung cancer.
- 5) Tannic acid causes liver damage when absorbed systemically

History

Box and Ham 1942-Zinc oxide eugenol dressing for chemical curettage in NUG pts. It contained Tannic acid– Hemostasis, astringent Thymol – antiseptic Dressing destroyed spirillum and fusi form bacteria present in NUG Orban 1943– Zinc oxide eugenol dressing and paraformaldehyde were used to perform gingivectomy by chemosurgery. However dressing caused extensive necrosis of gingiva and bone. Promoted abscess formation by blocking exudate.

Non eugenol dressings (soft packs)

- A. Coe- pack
- B. Peripac
- C. Vocopack
- D. Perio-care

Coe-pak

Most common and widely used: non-eugenol dressing. Manufactured by: Coe Laboratories Inc., Chicago, IL, USA Supplied as: i) two pastes ii) auto-mixing system in syringe.

- i) Paste form

Composition: Smith D C 1970

(Accelerator)

- a.Zinc Oxide-Antiseptic and Astringent
- b.Veg. Oil-Plasticity
- c.Lorothidol-Fungicide
- d.Magnesium oxide-Helps in setting reaction
- e.Gum-Cohesiveness

(Base paste)

- a. Liquid coconut fatty acid-Helps in chemical reaction

- b. Colophony resin-Regulates the setting time
- c. Chlorothymol- Bacteriostatic

The reaction between metallic salts and fatty acid is the main basis for Coe-Pak. Dressing does not contain asbestos and eugenol thereby avoiding problems associated with these ingredients.

Coe – Pak (Auto mixing System)

Contained within a syringe. 2 Cylinders contain a base and accelerator respectively. Pull the trigger and bring the pastes mix at the tip of syringe. It is then deposited on mixing pad. Within 30 seconds it sets and hardens much faster than manually mixed system.

Peripac (Sachs and Farnoush, 1984)

Manufactured by: GC America Inc., Chicago, USA.

Premixed zinc-oxide dressings are available.

Composition- contains calcium sulfate, zinc oxide, polymethylmethacrylate, dimethoxytetra-ethylene glycol, flavoring agents, colouring agents.

To use this material, a small quantity should be taken from the jar with a dry sterile spatula and deposited on a paper napkin. Hardening of Peripac begins as soon as it comes into contact with water and is complete in about 20 minutes. Application of the dressing should not take more than 2-3 minutes. A correctly applied dressing remains with no change for 8-10 days.

Vocopac (VOCO, 2010)

Manufactured by: Voco, Cuxhaven, Germany.

It is supplied as two pastes (base and catalyst) that chemically.

Vocopac: contains purified colophonium, zinc oxide, zinc acetate, magnesium oxide, fatty acids, natural resin and natural oils and colorant. Mixing time– 20 – 30 secs.

Advantage: This material remains elastic in the patient's mouth and is not brittle. Causes no gingival irritation. Adheres excellently to teeth and promotes healing.

Contraindication

In patients who are allergic to these ingredients and contact with the bone should be avoided as well. Slight discoloration of synthetic materials may also occur

Perio care (<http://www.pulpdent.com/products/view/133>)

Manufactured by: Voco, Cuxhaven, Germany.

Available as– Paste-gel form

1. Paste – Zinc-oxide, magnesium oxide, calcium hydroxide, vegetable oils.
2. Gel – Resins, fatty acids, ethyl cellulose, lanolin, calcium hydroxide.

Equal amounts of paste and gel must be mixed on the mixing pad until the color becomes uniform. Setting time of this

product is 45-60 seconds and the working time is 4-5 minutes

Packs that contain neither zinc oxide nor eugenol

- a. Perioputty
- b. Barricaid
- c. Methacrylic gel dressings
- d. Cyanoacrylates
- e. Collagen dressings

Perio Putty (Gurey, 1969)

It is a Non Eugenol dressing, Manufactured by Cadco Dental Products, Inc. in Los Angeles Contains 1. Methyl and propyl parabens- for their bactericidal and fungicidal properties 2. Topical anesthetic- Benzocaine.

Barricaid periodontal dressing

Light cure dressing, Syringe form,

Composition: Contains polyether -urethane dimethacrylate resin-silanated silica, Visible Light Cure photo initiator and accelerator, stabiliser, colorant

Advantages

1. Non brittle and very elastic
2. No mixing-Single- component, light -activated periodontal dressing eliminates time consuming mixing of pastes.
3. Curing with a visible light-curing unit to form non-brittle, but firm, protective elastic covering
4. Incremental additions of the material, which bond adherently, can be made in the mouth without any special prior surface preparation.
5. The dressing is tinted pink, is tasteless, and has a translucent character which allows for superior esthetics.
6. Designed for both Direct and Indirect Placement. If the syringe is used in direct intra-oral placement, the syringe must be discarded to avoid any potential patient cross-infection.

Disadvantage

Polymerisable monomers may cause skin sensitization in susceptible persons.

Methacrylic Gel

Used as tissue conditioners or as denture liners.

Advantage

1. Methacrylic gels were used primarily in dentistry as tissue conditioners or as denture liners. Soft and resilient, flows under pressure hence ideal for use in dentures.
2. Adapt closely to tissues,
3. Comfortable to wound,
4. Act as a vehicle for medicaments (Chlorhexidine) to soft tissues.

Disadvantage

1. Can't be used alone as a dressing,
2. Poor retention
3. More stiffness with Zinc oxide powder.

Cyanoacrylate (Tissue adhesive)

Synthesized by Coover *et al* in 1959. The chemical formula— $H_2C=C(CN)COOR$, where R-can be substituted for any alkyl group ranging from methyl to decyl. In 1965 Dr. S.N. Bhaskar conceived of the idea of the potential of cyanoacrylates as periodontal dressings.

Properties: (Kulkarni *et al.*, 2007)

- 1) Strong adhesion: to the tissues in the presence of moisture
- 2) Workable polymerization time
- 3) Biodegradability- are eliminated in the faeces and urine, inhibit bacterial growth
- 4) Bacteriostatic
- 5) Hemostasis.
- 6) Reduction in post operative pain

Advantages

It is easy to apply, less bulky than others. No manipulation required. It is easy to takeout and easy to repair. It does not require chair assistance. It is transparent- so can see the healing of wound.

Disadvantages

Friction through mastication therefore retention is not possible. It may be toxic to nasal mucous membrane, throat, and eyes. Posterior part of oral cavity should be blocked by gauze pieces. It should not be used in CNS. Miller *et al.* (1974) also noted some bone resorption in response to Cyanoacrylates, and considered that heat of polymerization might also effect tissues .Cannot dissipate the pull of the lip or immobilize a flap for the time required for it to attach to the underlying tissues. Delayed healing occurs by foreign body reaction if the material becomes embedded in the tissues or underneath the flap.

Collagen Dressing

Collacote- Collagen sponge. It is type 1 collagen derived from bovine achilles tendon, protects palatal graft sites. Completely resorbable dressing, sponge. 3 mm. thick, stops bleeding, absorbs 30-40 times its wt. in fluid without swelling.

Present status and Value of a surgical dressing: Whether or not to use a dressing?

Evidence who did not support:

- 1) Loe and Silness 1961- In the absence of dressing complete healing still takes place (Loe and Silness, 1961).
- 2) Stahl *et al.*, 1969- Repair might be improved if a dressing is not used as it accumulates plaque and irritates healing tissue.

- 3) Greensmith and Wade 1974- use of dressing causes more pain and swelling but less sensitivity and eating difficulty when no dressing is used (Greensmith and Wade, 1974).
- 4) Jones and Cassingham 1979- Attributed disadvantages of dressings like- possibility of displacing the flap, entrapping of sutures beneath dressings, forcing the dressing material under the flap during placement.
- 5) Heaney and Appleton 1976 tested the effect of periodontal dressings when placed in periodontally healthy mouths, using either Coe-Pak or Wondrpak. They found that while the dressings caused little damage to the periodontium, they were associated with more inflammation than undressed areas.
- 6) Wampole *et al.*, 1978: found a 24% incidence of transient bacteremia in patients during postoperative dressing change. This finding was felt to be of significance in medically compromised cases, especially those with a history of rheumatic heart disease or bacterial endocarditis.

Sachs *et al.*, 1984– Evidence to support use of dressing in

Retention of an apically positioned flap to prevent physical coronal displacement. Provide Additional support to stabilize a free gingival graft. Denuded bone protected from further injury May act as a template for healing by preventing formation of excess granulation tissue. It was concluded that application of dressing is a matter of individual preference. Periodontal dressings do not improve post-operative healing and do not provide a significantly greater degree of comfort. They do contribute to plaque retention and may promote bacterial proliferation at the surgical sites.

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