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COMPOSITION FOR THE PROTECTION AND TREATMENT OF INJURED BODY TISSUE AND METHOD OF UTILIZING THE SAME

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4 Claims

ABSTRACT OF THE DISCLOSURE

Gel-forming substances are used to set and stabilize aerated carbohydrate solutions to form a soft, resilient and stable composition of therapeutic value in the healing of injured body tissues.

The composition is soluble in the body fluids and may be dissolved therein within any predetermined period. By varying the proportions of the principal ingredients or by the addition of suitable modifiers and/or medicaments the rate of dissolution may be altered and the therapeutic properties of the composition may be varied as circumstances may require.

BACKGROUND OF THE INVENTION

This invention relates to the direct treatment of injured mammalian tissues, e.g. abraded, lacerated, ulcerated, or infected tissue, through use of a soluble protective composition which is dissolved in the body fluids contacted thereby within a predetermined period of time. It further relates to such a composition, the components of which may themselves exhibit therapeutic properties, and which may additionally serve as a convenient vehicle or carrier for a variety of selected medicaments to be advantageously applied to, and/or absorbed by, the injured tissues.

As is well known, the skin, supporting body tissues, connective tissues, and viscera are subject to a variety of irritations, infections and injuries. This may result in disruption of normal tissue continuity, configuration and appearance, which may be evident as areas of ulceration, necrosis, contusion, laceration, inflammation, and tumefaction. Conventional dressings applied to such irritated or injured tissues often act as foreign bodies and are frequently themselves a source of irritation which may delay healing.

The local application of simple sugar to inflamed or injured tissues is one of many substances familiar to the healing art. Similarly, the local application of gelatin has also been employed to promote tissue repair.

It is a principal object of the present invention to provide a soluble dressing, filling or cementing material for injured tissue which is soft, flexible, protective, nonirritating, and which provides a temporary nucleus to facilitate the growth of replacement tissues for healing purposes. By virtue of its solubility and the capability of being rendered sterile during the manufacturing process, the subject invention is not restricted to external application but is adaptable to implantation within the body as, for example, in association with a surgical operation. Another object of this invention is to serve as a convenient vehicle for the local application of desirable medicaments. Other objects and advantages of the present invention including stability, convenience, economy and adaptability for use in conjunction with a variety of known dressing materials, will be apparent from the following detailed description of preferred embodiments thereof.

It may be noted that, in this specification and the claims appended hereto, all references to parts and percentages are given by weight and all temperatures are specified in degrees Fahrenheit.

SUMMARY OF THE INVENTION

The present invention is based on the discovery that known healing substances, namely carbohydrates, water and proteinaceous gel-forming materials can be combined and processed in predetermined concentrations so that the resulting product assumes desirable physical characteristics which are different from those of its components. Some of these desirable physical attributes include resiliency, pliability, compressibility, elasticity, malleability, and tackiness. It has been further discovered that these characteristics are such as to provide a physical barrier and protective coating for affected tissues. When employed externally as a surface dressing, the resiliency and similar protective qualities of this material minimize the harmful effects of direct pressure to areas of injury. Additionally, it has been observed that the physical characteristics of this invention are such as to provide a framework which encourages the growth of replacement tissues where normal tissue continuity has been altered. It has also been discovered that, depending on the degree of tackiness provided, this invention can facilitate the cementing of disrupted tissues.

Experience has shown that the subject composition will slowly dissolve following contact with body fluids and that the component ingredients are thereby solubilized and released. The gradual release of these components additionally provides the local therapeutic qualities and benefits which are characteristic of each. The compositions of this invention may be employed, for example, as a filling material for decubitus ulcers and other areas of surface injury. This is accomplished by protecting the otherwise exposed tissues from additional injury, by facilitating improved pressure distribution, by providing a lattice framework which encourages the growth of new tissue, and by providing soluble therapeutic materials which enhance tissue rejuvenation.

In accordance with the invention, a gel-forming substance is incorporated in an aerated, viscous carbohydrate liquid for the treatment of injured mammalian body tissue in amounts such that the gel-former comprises from about 1 to 10% of the total weight, carbohydrates constitute from between 50 to 85% of the total, and water varies from 10 to 40% thereof. When applied to injured tissue, the resulting gelled composition forms a relatively soft, flexible and resilient material which promotes healing and which, moreover, may be dissolved in the body fluids within a period generally of from 12 to 48 hours from the time of application.

The gel-forming constituent of the composition is suitably a proteinaceous material such as gelatin, or a natural or artificial gum such as gum arabic or tragacanth. Other proteinaceous materials which may be similarly utilized include ovalbumin (egg albumin), soya protein and casein. Carbohydrate polymers such as dextrin have also been employed for purposes of gel-formation.

The aerated, viscous component of the composition is generally selected from among the various classes of carbohydrates. Useful carbohydrates include monosaccharides, e.g., glucose, fructose; disaccharides, e.g., sucrose, lactose, maltose; and polysaccharides, e.g., dextrin and certain processed and solubilized starches. In some formulations carbohydrates may be utilized in the form of corn syrup, which comprises approximately 80% of mixed saccharides, principally glucose. Invert sugar may also be used as a source of carbohydrate in amounts up to 50% by weight of the total carbohydrate employed. In some formulations a single sugar such as sucrose or glucose has been employed as the sole carbohydrate component in concentrations up to 85% by weight of the total formula. Preferably, sucrose is employed as the principal carbohydrate constituent; the use of glucose