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SURGICAL DRESSINGS

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The object of this invention is to provide surgical dressings which are substantially non-greasy and non-tacky to touch but do not adhere to the raw wound surface and can be easily removed without causing pain or damage to the delicate healing tissues and also provide good drainage so that sogginess of the wound, which is a common fault of many non-adherent dressings in present use, does not occur.

Dressings such as described above may be formed from a variety of film-forming substances, such as nylon copolymer or cellulose acetate, and a water-soluble oily, fatty or waxy compound, e.g. a polyethylene glycol or an aqueous emulsion of an oil, fat or wax, or a self-emulsifying oil, fat or wax or a mixture of these.

For example, one part of polyethylene glycol 400 and 2 parts of cellulose acetate may be dissolved in 8 parts or more parts of acetone and cast into a film of approximately one thousandth of an inch thickness. The film is perforated with holes of 1 to 2 millimetres in diameter which may be spaced at a distance of 5 to 10 millimetres from each other. The film is then coated with an aqueous solution (1 to 2%) of a swelling agent, such as methyl cellulose or sodium aliginate, on one or both sides and dried. The coating may be effected by passing the film through a solution of the swelling agent and passing through rollers to remove excess of the solution or simply by brushing the solution on. The film is then sterilised and is ready for use as a surgical dressing. Its special advantages are that it is water-absorbent; thus, without the perforations, it will allow water under a slight tension to pass from one side of the film to the other, the holes allow free exit to pus and other thick exudate from the wound. The coating of the swelling agent also readily takes up moisture from the wound surface and forms a cushion under the film and promotes better flow of moisture under the film between the perforations, and through the holes to the outer dressings. Another advantage of this type of dressing is that being transparent it allows inspection of the condition of the wound without removing the dressing.

As the water absorbent property of films made according to this invention varies with the thickness of the film, i.e. the thinner the film, the better its water-absorbent properties, as an alternative to casting the film and using it as a dressing, the solution of cellulose acetate and polyethylene glycol may be spread more thinly on a fabric of good water-absorbent properties, such as cotton or rayon, and having a fairly close texture, such as a count of 32; 24 warp and weft, or more, by roller coating or with a brush, to make a continuous film having a thickness of about half one thousandth of an inch and the cloth may then be used as a dressing, after perforating it in places to allow thick exudate of pus and blood to pass through the holes. As in the case of the film, the coating of the cellulose acetate applied to the cloth may also be covered with a thin layer of a swelling agent e.g. methyl cellulose. Alternatively, the cloth may be simply dipped in the solution of cellulose acetate and polyethylene glycol in acetone and passed between rollers to remove excess of the solution, just to cover all the strands of the fabric with the cellulose acetate mixture, without blocking all the interstices. The cloth so treated many then be dried and passed through the aqueous solution of the swelling agent.

In another embodiment of this invention, cellulose acetate may first be converted into fabric which may be

obtained commercially. For treating burns and wounds in general, I have found that a close texture with a count of 80; 60 or more, warp and weft, per square inch is very suitable because it prevents the growth of epithelium and granulation tissue through the interstices and over the strands, which is one of the causes of dressings made of open mesh gauzes being embedded in the tissue and becoming difficult to remove, while for septic wounds which are discharging thick pus in large quantities, a net construction may be used until the sepsis is under control and the wound has commenced to heal. The cloth made of cellulose acetate is dipped in a highly concentrated aqueous solution of a polyethylene glycol or a mixture of polyethylene glycol, say 15 percent or more and an aqueous emulsion of an oil, fat or wax, say 15%, made with an emulsifying agent consisting preferably of morpholine soap or a soap of another volatile substituted ammonia compound. Morpholine or a volatile substituted ammonia is preferred because it evaporates when the cloth is dried after impregnation and leaves the oil, fat or wax deposited in a form in which it cannot readily leave the fabric and maintains a non-adherent condition over a prolonged period. A small quantity, 1 or 2% of a swelling agent may also be added to the aqueous solution of polyethylene glycol or the mixture with the aqueous emulsion of an oil, fat or wax. After dipping, the cloth is squeezed between rollers and dried at a temperature of 90° to 120° C. It is found that the cloth so treated is substantially non-greasy and non-tacky to touch, having absorbed the polyethylene glycol and the oil, fat or wax as the case may be into the fibre, which is thereby rendered extremely non-adherent to the wound surface. The swelling agent when dried, leaves a thin film over the fibre which as in the case of films described above, plays an important role in promoting drainage of moisture from the wound along the interstices of the fabric to the outer dressings which normally consist of absorbent cotton or cellulose wadding.

Dressings similar to the above may also be made from rayon, but rayon does not absorb polyethylene glycols as well as cellulose acetate.

When using cellulose acetate material, film or fabric, or rayon it is an advantage to add an alkaline substance innocuous to the skin and the wound surface to the film or the fabric or to the emulsion or solution used for impregnation to absorb any acidity which might develop in the material derived from cellulose on account of any residue of sulphur which is used in the manufacture of regenerated cellulose and cellulose acetate, and which may cause chemical irritation, which is one of the reasons why cellulosic fabric has not found favour with surgeons as material for surgical dressings. 1 percent of borax or triethanolamine are examples of alkaline substances which may be used.

Antibacterial or healing agents may be added to the cellulose acetate solution, to the aqueous emulsion or the aqueous solution of the swelling agent according to their solubilities. Examples of suitable substances are tribromophenol "Actamer," neomycin sulphate, and aminoacrine hydrochloride B.P.

In a further embodiment of the invention, a film consisting of cellulose acetate, as described above, for example a film consisting of 20 parts of cellulose acetate, 10 parts of a polyethylene glycol and 70 parts of acetone, is made more porous by simply pouring water over the film immediately after the film has been cast but before it has had time to set.

The addition of a small percentage, such as 1 to 2% of a suitable sulphonated emulsifying agent to the solution of the film-forming agent in an organic solvent causes the formation of even more porous films having visible holes here and there. A suitable sulphonated emulsifying

agent is that known as Tenapol; this may first be mixed with a little water or spirit and then the aqueous or spirituous solution mixed with the solution of the film-forming substance in the organic solvent.

I claim:

1. A surgical dressing comprising, in combination, a sheet-like member of cellulose acetate having a polyethylene glycol distributed therethrough; and a coating consisting essentially of a swelling agent on at least one face of said sheet.

2. A surgical dressing comprising, in combination, a sheet-like member of cellulose acetate having a polyethylene glycol distributed therethrough; and a coating consisting essentially of a swelling agent selected from the group consisting of methyl cellulose and sodium alginate substantially covering at least one face of said sheet.

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