Corneal Protection for Burn Patients

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PUBLIC ABSTRACT

The overall goal of this study is to prevent damage to the cornea, and possible loss of vision, of burn patients during their recovery period. The cornea is the outermost clear tissue of the eye. Often the patient's eyes are not directly damaged when they are burned, even though the skin on their face is severely burned. As the facial skin heals and scars, it contracts the skin away from the eyes forcing the patient's eyes to remain open day and night. This causes the eyes to dry out because the patient cannot blink. Often skin grafting is delayed because very little healthy skin is available. Even when skin grafts are used to replace eyelids and skin around the eyes, they form scars that also contract skin away from the eyes. Thus, many burn patients develop eye complications, and possible loss of ability to see through their cornea, even when their eyes were not initially damaged by the burn.

Blinking is needed to provide tears over the cornea, which keeps the cornea wet and healthy. When the cornea is dry for long periods, infections begin and parts of the cornea die. The cornea may become cloudy preventing the burn patient from seeing their families, friends, and care-providers. To prevent this loss of sight, hospital staff must add moisturizing drops to the patient's eyes frequently, as the patients are unable to do this for themselves because of their injuries. This is time consuming and difficult in a busy burn center that cares for many critically burned patients. The alternatives are placing special dressings on the eyes that are extremely expensive and need to be changed daily.

This research is directed at modifying currently used clinical materials to produce a bandage that keeps the corneas of burn patients healthy during the period when they cannot close their eyes. We will modify a biological dressing to make it last longer and provide greater moisture to the eye.

If these studies are successful, damage to the cornea due to extended drying during recovery from severe facial burns will be minimized, resulting in retention of vision. In addition, the care for these patients' eyes will be simplified during their recovery, and the costs of treating the corneas of burn patients will be greatly reduced.

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