Foam, Alginate, Collagen, and Transparent Dressings

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This article continues the general overview of dressings, which was was begun in the July 2021 issue of *Wound Management & Prevention*. Here the author shares the wound care basics of foam, alginate, collagen, and transparent dressings.

FOAM DRESSINGS

A foam dressing usually consists of an opaque polyurethane membrane that is "partially occlusive to liquids" (i.e, somewhat waterproof) but "permeable to vapors" (ie, a bubble will not form underneath the dressing).[1] Many foam dressings have an additional outer film coating to protect against friction, bacteria, or irritating substances such as stool. In many products, the outer film is waterproof, which allows the patient to shower. These dressings are frequently used over pressure injuries or to protect inflamed skin. Foam dressings are highly absorbent and usually can be left on for several days; they decrease maceration of surrounding tissue by absorbing moisture, such as sweat or urine.[2]

It is important to note that the dressing has to be removed and replaced if it becomes saturated or if the dressing edges start to come up (eg, due to friction with bed sheets).

Foam dressings have multiple advantages apart from their absorbency. Some common types have an adhesive border, but the part of the dressing in contact with the wound is not adherent. This makes the dressing easier and less traumatic to the patient to remove. Foam dressings can be used as primary or secondary dressings on wounds with drainage, whether mild or heavy. This includes drainage that occurs around tubes, such as percutaneous endoscopic gastrostomy tubes.[3]

In the author's experience, foam dressings over the sacrum often do better with a secondary dressing, such as an ABD pad, to provide extra cushioning and to protect against fecal or urine contamination. In addition, foam dressings are generally not used over eschar or other dry wounds, because they may dry the wound even further. Wounds need a moist environment for optimal healing.

ALGINATE DRESSINGS

Calcium alginate dressings are made from the calcium salts and fibers of brown seaweed,[4,5] which makes these dressings biodegradable (an unusual characteristic in medical products). However, these dressings require a secondary dressing, which, of course, is generally not biodegradable. The author has found alginate dressings to be particularly useful in difficult-to-treat areas, such as the heels or sacrum/coccyx.

These dressings already have significant antibacterial properties and are also available as silver calcium alginate, which incorporates nanocrystalline (small amounts of) silver. Both forms are highly absorbent and are commonly used on wounds with moderate to heavy exudate. The author has found that the dressing can absorb many times its own weight of exudate, which eventually becomes visible at the edge of the dressing, indicating that the dressing needs to be changed, typically about every 2 days, or even daily if necessary.

Infection is a frequent cause of heavy exudate and should be considered as a likely cause if the exudate is getting worse over time. As the exudate and infection improve, odor also improves.

The alginate also has hemostatic properties that help to control minor bleeding (eg, in a postoperative or post-debridement wound). It will not be adequate for any type of heavier bleeding, however. Of course, if there is heavier bleeding postoperatively, local pressure should be applied and the surgeon informed immediately.

One example of a modern alginate dressing is Restore Calcium Alginate Dressing – Silver (Hollister), but there are dozens of alginate dressings on the market. An alginate dressing should not be used on a dry wound because it can make things worse due to dessication.

COLLAGEN DRESSINGS

Collagen is a common protein, a major building block of the body, found in the skin as well as bones, muscles, tendons, and blood vessels. The word comes from the Greek *kolla*, which means "glue," and gen, which means "giving birth to."6 There are 4 or 5 main types of collagen, but there are many others as well. For the current purposes, we are mainly interested in type I, which is one of the most important and common molecules in the structure of the body including the skin.[7] It is collagen that gives skin its firmness, in combination with the protein elastin that keeps the skin tight. Loss of elastin as we age is the main reason that we get those unwelcome wrinkles, and also a major reason that skin breakdown is more likely to occur in the elderly.

Collagen dressings are derived from animal sources, such as porcine (pig), equine (horse), or bovine (cows) hides. The dressings encourage the production of human collagen at the wound site, and can be used on pressure injuries, foot ulcers,

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chronic wounds (more than 30 days old), large open cuts, necrotic wounds (but not dry eschar), skin grafts, and second-degree (but not third-degree) burns.[8]

Most collagen dressings have a 1% silver component because of its antibacterial properties. Generally, a collagen dressing can be left on for about 7 days, unless the dressing is contaminated or distorted. One example is Promogran Prisma Matrix (3M), which is composed of a balanced combination of mostly collagen, cellulose, and silver. However, there are many excellent collagen products on the market from different manufacturers.

TRANSPARENT DRESSINGS

These useful and flexible dressings are often used to cover IV sites, catheters, lacerations, and second-degree burns. The dressing consists of a thin, see-through material, such as polyurethane. The dressing can be used on dry necrotic wounds or stage 2 pressure injuries, where they are somewhat protective if a secondary dressing, such as an ABD pad, is added. This can easily be removed to check on the status of the wound without disturbing the primary dressing.

Transparent dressings should not be used on a wound with heavy drainage or exudate; there are other dressings that can handle that problem much better, as described above. Transparent dressings will help to maintain a moist wound environment, which is a good thing on a dry wound.

Transparent polyurethane dressings are usually water-proof, bacteria-proof, and contaminant-proof, which also would be true for most plastic sheets (a plastic sheet is a plastic material thicker than 0.01"; if it is thinner than that, it is a "film"). Of course, if the wound is already infected, the bacteria or fungus can grow underneath the dressing. In addition, if the dressing extends to healthy skin, that skin can become macerated and fragile. For that reason, the dressing should be approximately the shape of the wound with a 2-cm to 3-cm border, and with a secondary dressing to hold it in place.

The author has found that these types of dressings can be left on for about 5 days unless they need earlier changing because of leakage or skin irritation. In addition, transparent dressings can be very good on smaller wounds with little or no drainage and no signs of infection.

SUMMARY

When I first started doing wound care more than 20 years ago, one of the biggest early challenges was choosing the correct dressings for any particular wound. These brief articles, published since April 2021, have so far addressed guaze, hydrocolloid, hydrogel, foam, alginate, collagen, and transparent dressings; unfortunately, that does not cover it (pardon the pun). I will finish the discussion of dressings in the next article and create a summary of good choices for different types of wounds.

I certainly welcome any comments or different viewpoints from readers because I know this is a complicated subject. ■

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