Wound care of the advanced cancer patient

Kathryn G. Froiland, MSN, RN, AOCN, CWOCN

Division of Nursing, The University of Texas M.D. Anderson Cancer Center, 1515 Holcombe Blvd, Box 163, Houston, TX 77030, USA

Loss of skin integrity can cause significant distress to the patient and to the caregiver who is trying to provide comfort and promote healing under difficult circumstances. This article will discuss the assessment and management of wounds commonly found in oncology patients.

Clinical features

Pressure ulcers are areas of necrosis that develop when soft tissue is compressed between a bony prominence and an external surface for a prolonged period [1]. The coccyx, sacrum, and heel are most vulnerable, because there is less soft tissue present between the bone and skin in these areas; however, ulcers may develop in conjunction with any improperly fitting assistive device. The risk of pressure ulcer formation increases for those who experience atrophy of subcutaneous and muscle tissue layers. The National Pressure Ulcer Advisory Panel has classified pressure ulcers into stages that identify involved tissue layers.

Stage 1 and 2 pressure ulcers are the most common types seen in the oncology population. Risk is greater in oncology patients because of advanced age and concurrent chronic illness. Pain and fatigue may contribute to self-limited mobility during the course of the disease. Poor nutritional status (a common finding in patients with cancer) further impairs the ability to maintain skin integrity and to heal wounds.

Surgical wounds are acute wounds caused by a surgeon’s scalpel (Fig. 1). Many are closed at the conclusion of the surgical procedure. Closure may be delayed to allow for the edema or infection to resolve or for drainage of exudate. Closed wounds may open spontaneously or may require opening to allow for drainage of exudate, debridement of nonviable tissue, or treatment of infection. The cellular microenvironment of the wound is influenced by many factors.
factors, including tissue hypoxia, hypovolemia, postoperative warming, poor nutrition, diabetes mellitus, prior irradiation, and poor pain control. These factors all affect the patient’s ability to maintain a closed wound and to heal over time.

Although radiation therapy technology has improved over the years, skin-related alterations do occur and can be a source of discomfort during and after treatment. The cytotoxic effects of radiation on the skin are enhanced when combined with chemotherapy [2]. Acute reactions are a function of the dose delivered multiplied by the volume treated over time exposed to radiation, rather than the total applied dose. Radiation effects are cumulative but self-limiting, often subsiding within 3 months after therapy [3]. Skin manifestations can range from erythema to moist desquamation and blistering (Fig. 2).

Malignant cutaneous wounds are ulcerating cancerous lesions of the skin that may be open and draining [4]. Incidence of such wounds is estimated at 10% among patients with metastatic disease [5]. Although most commonly associated with breast cancer (Fig. 3), these wounds may metastasize from many primary sites. Wounds may contain firm, flesh-colored nodules, reddish-blue nodules, or cauliflower-like masses. Sinus tracts and fistulas may be found within the wounds. Depth of tissue involvement also varies. Bleeding is a common symptom associated with these lesions, and it impacts on the decision to debride necrotic tissue. A foul odor is common and is caused by infection and tissue necrosis.

Incontinence resulting in exposure of skin to urine moisture and the enzymes of stool can cause associated skin breakdown. The loss of this protective barrier opens a portal for infection. The skin becomes painful, thus hampering the
patient’s willingness to participate in cleansing procedures. Incontinence can be socially isolating and often promotes dependence on caregivers.
Assessment

Wound assessment and documentation should include the following findings:

- Degree of tissue layer destruction or color
- Anatomic location
- Length, width, depth, and tunneling—using consistent units of measure
- Appearance of the wound bed and surrounding skin
- Drainage—specifying amount, color, and consistency
- Pain or tenderness
- Temperature [6]

Although these parameters were developed to assess pressure ulcers, they are useful for assessing other types of wounds.

The skin surrounding the wound must be assessed for color, temperature, and swelling. Excessive dryness or moisture or nonviable tissue or exudate may delay re-epithelialization once granulation occurs. Finally, assess the wound for the presence of foreign objects, such as sutures, staples, or environmental debris. Removal, if possible, is recommended [6].

Urinary or fecal incontinence

The patient’s history is evaluated to determine the cause of incontinence, and the perineal skin is examined. Complicating factors, such as infection, retention of urine, fecal impaction, recent initiation of enteral feedings, mobility impairment, and neurologic disorders, are identified. Further urodynamic or anorectal physiological testing can be deferred until the patient’s cancer is controlled. Once causation has been determined, various factors can be manipulated to decrease further episodes of incontinence.

Skin-related damage may appear as an irritant contact dermatitis involving erythema, edema, and vesicle formation. Failure to remove the irritant (urine or stool) will result in progressive inflammation of the skin, resulting in blistering, erosion of epidermis, weeping, and pain. Itching and burning occur with mild inflammation, whereas severe inflammation is associated with epidermal loss and exposure of dermal nerve endings, causing pain.

Intertrigo is a mild Candida infection that occurs within warm, moist skin folds. It may be mistaken for irritant dermatitis and appears as superficial linear erosions at the base of a skinfold or circular erosions between the buttocks, with surrounding erythema. It is commonly found on the skin of diabetic and obese patients, especially if their mobility is impaired.

Perineal yeast infections caused by Candida albicans are common among individuals who are incontinent and those who are immunocompromised. The resultant rash appears as an area of confluent erythema, which is more intense in the center and may lack a distinct border. Pinpoint satellite vesicles are
visible at the periphery. Friction will unroof the vesicles, causing them to appear as macules. Scaling may be present. Long-term infections cause hyperpigmentation of the affected area and may be mistaken for a pressure ulcer, especially if seen over the sacrum or coccyx [7].

Prognosis and treatment

Topical wound management helps keep the wound moist, clean, warm, and protected from trauma and secondary infection. More than 2000 products are available on the market today. The following list describes products that are useful in caring for several types of wounds. A limited number of examples are included. The reader is referred to wound care texts [6,8] and to manufacturers’ packaging information for more detail. Consultation with a certified wound, ostomy, and continence care nurse is advised (www.wocn.org or 1-888-224-WOCN).

Alginates are derived from seaweed and absorb up to 20 times their weight. They interact with exudate to form a soft gel. This gel maintains a moist wound environment, facilitates autolytic debridement, fills dead space, and is easy to apply and remove. Alginates dehydrate lightly exudating wounds and require a secondary dressing (Bard AlgiDERM, CR Bard, Inc, Covington, GA; Smith & Nephew AlgiSite M, Smith & Nephew, Inc, Largo, FL; Coloplast Comfeel SeaSorb, Coloplast Corp, Marietta, GA).

Collagen encourages the deposition and organization of newly formed collagen fibers and granulation tissue in the wound bed. It may be used on pressure ulcers; on infected and noninfected wounds; in tunnels; to absorb minimal to heavy exudate; and on skin grafts and donor sites. It maintains a moist wound environment, is conforming, and is nonadherent. It is not recommended for third-degree burns or for wounds containing dry eschar, because it requires a secondary dressing (Johnson & Johnson FIBRACOL, ETHICON, Inc, Somerville, NJ; Hymed hyCURE, The Hymed Group Corp, Bethlehem, PA; BioCore Kallagen-Medifill II Gel, BioCore Medical Technologies, Inc, Silver Spring, MD).

Composite dressings combine two or more distinct products, which are manufactured as one dressing. Features of the dressing include a bacterial barrier; an absorptive nonalginate layer, foam, hydrocolloid, or hydrogel; a semi- or nonadherent property for wound contact; and an adhesive border. They may be used as primary or secondary dressings on wounds with minimal to heavy exudate, healthy granulation tissue, moist necrotic tissue, or granulation and necrotic tissue. Composites facilitate autolytic debridement, allow moisture vapor exchange, and may be used on infected wounds. They are easy to apply and remove but require intact periwound skin for anchoring the dressing (Molnlycke Alldress, Molnlycke Health Care, Eddystone, PA; DeRoyal COVADERM PLUS DeRoyal, Powell, TN; Kendall TELFA Island Dressing, Kendall Health Care Products Company, Mansfield, MA).
Foams are absorbent, create a moist environment, and provide thermal insulation to the wound. Being nonadherent, they are easy to apply and remove. They may require a secondary dressing, tape, wrap, or net to hold in place (Beiersdorf Cutinova Foam, Beiersdorf-Jobst, Inc, Charlotte, NC; Bertek (Dow Hickam) Flexzan Bertek (Dow Hickam) Pharmaceuticals, Research Triangle Park, NC; ConvaTec Lyofoam ConvaTec, Skillman, NJ).

Hydrocolloids are occlusive or semiocclusive dressings composed of gelatin, pectin, or carboxymethylcellulose. They create a moist environment allowing clean wounds to granulate and necrotic wounds to debride. They are used as primary or secondary dressings to manage pressure ulcers, wounds with nonviable eschar or slough, or wounds with light to moderate exudate. Although impermeable to contaminants, they limit gas exchange with the environment. They are self-adhesive and mold well. The edges may curl and injure fragile skin when removed. Use with caution on skin of patients with thrombocytopenia. They may be placed along the edges of surgical wounds to protect periwound skin from moisture and dermal stripping caused by traumatic tape removal (ConvaTec DuoDERM; Coloplast Comfeel; 3M Tegasorb, 3M Health Care, St. Paul, MN).

Hydrofiber dressings are soft nonwoven dressings made from sodium carboxymethylcellulose fibers (AQUACEL; ConvaTec). They are highly absorbent for managing exudating wounds of all types. As absorption occurs, gel forms, providing a moist environment that promotes debridement and nontraumatic removal. They may be used as an alternative to an alginate dressing.

Hydrogels are water- or glycerin-based amorphous gels, impregnated gauze, or sheet dressings. They maintain a moist environment, promote granulation and epithelialization, and facilitate autolytic debridement. They are soothing and may reduce pain in minor burns and radiation-induced skin breakdown. They provide minimal to moderate absorption, dehydrate if not covered with a secondary dressing, and may cause periwound breakdown if allowed to contact intact skin (Carrington Carrasyn Gel, Carrington Laboratories, Irving, TX; ConvaTec SAF-Gel; Bard Vigilon, Bard Medical Division, CR Bard, Inc, Covington, GA).

Specialty absorptives are multilayered dressings consisting of highly absorptive layers of cellulose, cotton, or rayon fibers. They are used as secondary dressings, are semi- to nonadherent, and are highly absorptive (Smith & Nephew EXU-DRY; Healthpoint IODOFLEX PAD, Healthpoint, Fort Worth, TX; DeRoyal Sofsorb).

Transparent films are adhesive, waterproof and impermeable to contaminants, and permit water vapor to cross the semipermeable barrier. Films maintain a moist environment and facilitate autolytic debridement. Their transparency permits wound observation. Films may be used as primary dressings on nondraining wounds, such as skin tears or as secondary dressings. Films should not be placed over infected wounds and are not recommended for use on fragile skin. Dressings placed on high-friction areas may dislodge (Johnson & Johnson BIOCLUSIVE; Smith & Nephew OpSite; 3M Tegaderm).
Selected other products

Cream or emulsion dressings

BIAFINE Radiodermatitis Emulsion dressing (Medix Pharmaceuticals Americas, Inc., Largo, FL) recruits macrophages to promote granulation, debrides autolytically, creates a moist environment, absorbs exudate, and decreases odor.

Debriding agents

ACCUZYME Papain-Urea Debriding Ointment (Healthpoint) contains papain, which is a proteolytic enzyme that digests nonviable protein matter without harming healthy tissue. It is indicated to debride necrotic tissue and to liquefy slough in pressure ulcers, burns, surgical wounds, vascular wounds, and infected wounds.

Collagenase SANTYL Ointment (Smith & Nephew) is a collagen-specific proteolytic enzyme that debrides necrotic tissue without harming healthy granulation tissue. Debridement of chronic dermal ulcers and burned areas is its indicated usage. It should be used with a topical antibiotic powder in infected wounds.

Skin sealants provide a transparent waterproof barrier that protects intact skin from excess moisture. They come in several forms, including wipes, sprays, and gels. Those containing a minimal amount of alcohol or none at all are most comfortable on tender skin.

Vacuum-assisted closure/negative pressure wound therapy (Kinetic Concepts, Inc., San Antonio, TX) evacuates wound fluid, reduces localized edema, stimulates granulation tissue formation, and reduces bacterial colonization.

Fig. 4. Abdominal surgical wound with vacuum-assisted closure dressing in place.
counts. Open-cell foam sponge is fit into the wound, the wound is sealed with an adhesive drape, and subatmospheric pressure is applied through an evacuation tube by a computerized pump. The pump is programmed to deliver the appropriate amount of negative pressure based on the individual characteristics of the wound. Therapy is applied until closure is achieved or until the wound has granulated sufficiently for surgical closure. This therapy has been used successfully in oncology patients who have surgical wounds and pressure ulcers (Fig. 4).

**Care of irradiated skin**

Cleaning skin with tepid water is advisable. A minimal amount of mild soap may be used if necessary. Skin may be rinsed gently with water using a spray bottle. The skin should be patted dry with a soft towel or may be dried with a hair dryer set on a low or cool setting. Exposure to heat or cold should be avoided. Perfume, deodorant, makeup, scented soaps, adhesives, and tight-fitting clothes should not be used in the treatment area.

Itching is often caused by dryness. Use of ointments, lotions, or moisturizers should be approved by the radiation oncologist to avoid interference with treatment. Aquaphor (Beiersdorf) and BIAFINE are products commonly used to rehydrate and moisturize erythematous and desquamated skin. Hydrogels, wafers, and sheets may be applied to provide comfort to inflamed areas. Cooling the wafers or sheets by refrigeration may soothe the exposed nerve endings.

If the skin becomes moist and weepy, nonadherent absorptive dressings can be applied. They should be secured by nonbinding elastic mesh garments to intact, nonirradiated skin. The patient must be supported with adequate pain-relieving medication. Topical application of anesthetic gel may provide short-term relief. Symptom management should be continued after completion of radiation therapy, because reactions continue for several weeks or months after treatment.

**Care of malignant cutaneous wounds**

The wound is often painful. Nonadherent dressings that offer long wear times (ie, changes no more often than every 2 to 3 days) should be considered to minimize pain. Hydrocolloid dressings applied to fragile periwound skin will decrease trauma. Nontraumatic tapes and mesh netting can be used to affix dressings and to ease removal of dressings.

Hemostatic dressings, nonadherent gauze, alginates, and silver nitrate can be used to control minor bleeding. Appropriate precautions must be taken when sharply debriding these wounds, because vascular structures are often difficult to identify and because bleeding may be difficult to control.

Necrotic tissue, infection, or saturated dressings are sources of odor. Ionic irrigants or wound cleansers can mechanically remove odorous necrotic tissue. Absorbent dressings, polysaccharide beads (Healthpoint IODOSORB), sodium-
impregnated gauze (Molnlycke MESALT), and alginates absorb odorous wound fluid. Charcoal-impregnated dressings (ConvaTec CARBOFLEX and LYO-FOAM C; Johnson & Johnson ACTISORB PLUS), used as the outermost layer of the dressing, suppress odor until saturated. The amount of exudate and extent of odor will determine the frequency of dressing changes.

Conservative autolytic or enzymatic debridement can be used to gently and effectively soften and remove necrotic tissue. Although appropriate, surgical debridement is used less commonly because of the risk of bleeding [9].

Antimicrobial creams, dressings with antibacterial properties, antibiotic solutions, and sodium-impregnated gauze may reduce bacterial load, thereby reducing odor. Metronidazole (gel or crushed tablets in normal saline solution) applied one to two times daily to the wound bed or on gauze placed over the wound will suppress odor (indication not US Food and Drug Administration approved) [8]. Biologic odor-eliminating sprays can help control environmental odors. Although readily available and less costly, spray deodorizers and vanilla extract or orange oil only mask odor. It is advisable to change odorous dressings when strikethrough of drainage occurs.

Fig. 5. 58-year-old woman with Mycosis fungoides.
The volume of exudate varies and determines the type of dressing required to contain it. Algimates and foam dressings can contain moderate to large amounts of exudate. Heavily exudative wounds need superabsorbent pads and an alginate or hydrofiber dressing, absorptive powder, beads, or wound-filler products.

Wound drainage pouches should be considered when dressings require frequent changing, when odor is uncontrolled, or when the periwound skin shows signs of impending breakdown. Pouching may facilitate the patient’s ability to ambulate without concern for dislodging bulky, moist, dressing material.

Cutaneous lesions associated with mycosis fungoides appear as blisters or bullae that vary in size and number (Fig. 5). These lesions open and drain watery fluid and can be quite painful and can cause heat loss as drainage evaporates. Surrounding skin may be sensitive and friable. The skin may be very dry, cracked, and inelastic. Itching is usually remedied with diligent application of a heavy petrolatum-based moisturizer (Beiersdorf AQUAPHOR) after bathing and as needed for relief. Antibiotic ointment applied to open areas protects against infection. Some patients have found whirlpool treatments comforting and effective in gently debriding nonviable tissue. Absorbent, nonadhering dressings secured with roll gauze can collect drainage between treatments.

**Care of skin affected by urinary or fecal incontinence**

Mild cleansers provide gentle cleaning action, require no rinsing, and leave a protective barrier on the skin. These products minimize patient discomfort and shorten caregiver’s cleaning time.

A moisture barrier cream or ointment is advised for both preventing and treating skin breakdown. Petrolatum, dimethicone, and zinc oxide are common ingredients in these products. An antifungal agent may be added to the moisture barrier ointment and is effective in treating yeast-induced rashes.

Devices for managing urinary incontinence for men include external or condom catheters and adhesive urinary pouches. Both types of devices are attached to collection bags that can measure volume and contain urine. Each device should be applied according to the manufacturer’s instructions to promote skin integrity and should allow a wear time of 24 to 72 hours or longer.

External collection devices for women are very limited. An external pouch is available that is useful for short-term urine collection in the bedridden patient. Unfortunately, the device does not adhere for long-term care nor does it facilitate mobility.

Indwelling catheters may be the best option for managing urinary incontinence in severely or terminally ill cancer patients. The perineum and the catheter should be cleansed daily. A closed drainage system (catheter and drainage bag) should be maintained and changed as a unit.

Rectal tubes are not advised because an inflated anchoring balloon can cause tissue necrosis in the rectum. An appropriately applied fecal incontinence collector is an alternative management device. Denuded skin can be prepared
with moisture-absorbing powder and skin sealants or thin hydrocolloid dressings to provide a dry surface for pouching.

Absorbent pads and garments are available in many sizes and designs and are either disposable or reusable. Those products that contain polymer products wick urine away from the skin and contain a gel, which makes them more effective than nonpolymer products [10]. Unfortunately, similar products for containment of stool and control of its odor are not as readily available.

Summary

Prevention remains our best defense in maintaining skin integrity. Daily skin inspection, gentle cleaning, cleansing after episodes of incontinence, moisturizer use, containment of drainage, and minimization of contributing factors are essential steps in caring for patients who are at risk for or who actually develop wounds. Proper techniques for positioning can be taught to the patient and the caregiver. Support mattresses and cushions may be required to prevent or treat skin breakdown. Mobility training and strengthening can make a difference in the successful treatment of wounds. Adequate nutrition is essential for healing and plays a pivotal role in the success or failure of the treatment plan.

References