DERMATOLOGICAL CHANGES ASSOCIATED WITH VENOUS LEG ULCERS

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Peri-ulcer skin problems can present a challenge to healthcare professionals when managing venous leg ulcers. Many complicating factors may occur such as the presence of eczema, maceration, contact dermatitis, blistering, epidermal stripping, and malignant changes. It is essential that healthcare professionals have enough knowledge to be able to identify existing skin problems, recognise potential risk factors in maintaining skin integrity and instigate appropriate treatment interventions.

The management of patients' skin is an important part of managing venous leg ulcers. Failure to do so may result in further skin breakdown and much discomfort. Careful assessment of the skin should be included in the patient's holistic assessment. The skin around the ulcer should be examined for the presence of any existing conditions such as eczema, blisters, broken areas, maceration and thick skin scaling. Other factors that may affect skin integrity include excessive wound fluid remaining on the skin, oedema and the inappropriate use of tapes (*Table 1*). An individualised plan of care should be created based upon an assessment of the patient which includes planned interventions that will promote healing. The following are common problems that may be encountered along with suggestions on how to treat them.

Eczema

Eczema, also known as dermatitis, is an itchy, inflammatory disorder of the skin. In the acute phase the skin is red and itchy with tiny clear blisters that weep and some skin scaling (*Figure 1*). Once the condition becomes chronic the skin becomes dry and scaly (*Figure 2*). Hyperkeratosis is a chronic condition associated

Table 1

Potential risk factors and interventions for skin damage to the peri-ulcer area

Potential risk factor	Possible skin damage	Intervention
Heavily exuding wound	Maceration Reduction in barrier function	Use an appropriate dressing for wound conditions Apply barrier preparation to peri-ulcer skin Swab wound if infection is suspected
Acute eczema	Wet, weepy skin Reduction in barrier function Risk of secondary infection Risk of epidermal stripping from inappropriate treatment May be an allergic contact dermatitis	Prescribe topical steroid ointment If infected treat with systemic antibiotics Protect broken areas with a silicone dressing Protect skin with a suitable cotton sleeve before applying orthopaedic wool padding Consider referral for patch testing
Chronic eczema	Dry itchy skin may break down	Apply regular emollient such as 50% white soft paraffin in 50% liquid paraffin (50/50)
Vulnerable areas such as tibial crest and prominent malleoli or bones in foot	Skin damage may occur from the compression bandage	Apply adequate padding over the shin and around bony prominences in the ankle and foot
Oedema	Strong pressure or adhesive dressings applied to fragile oedematous tissues can cause skin trauma	Identify cause of oedema Reduce oedema with a period of elevation before applying a compression bandage Avoid adhesive tapes and dressings on oedematous skin

with venous disease that presents as thick scaling over the lower legs (*Figure 3*). Varicose eczema coincides with underlying venous dysfunction, although how the eczema develops and its relation to venous dysfunction remains unclear (Monk and Graham-Brown, 1992). Varicose eczema usually develops around the medial malleolus but can spread over the lower leg.

Management of eczema

The application of sustained graduated compression is considered to be the most important factor in the management of venous leg ulcers and controlling lower leg oedema, together with elevation and exercise (Fletcher et al, 1997). It is therefore essential that any local skin treatment for varicose eczema should be combined with adequate compression therapy.

Acute eczema

Topical steroids are the mainstay of treatment for eczema and dermatitis. Steroids are available in lotions, creams and ointments. The use of creams should be avoided on patients with chronic venous leg ulcers as they contain potential sensitisers, and ointments in a paraffin base should be used instead (Cameron and Powell, 1992). Prescribed topical steroids are classified according to their potency and must be applied sparingly to the skin. The choice of potency will be dependent on the severity of the reaction. The amount of steroid to be applied is measured in fingertip units (FTU), which is the amount of ointment expressed from a tube (with a 5mm diameter), along the distance from the tip of the adult index finger to the first crease, (Long and Finlay, 1991). One FTU is equivalent to 0.5g.

A patient with acute eczema over the lower leg would require three FTUs of a potent topical

Figure 1. Acute eczema.

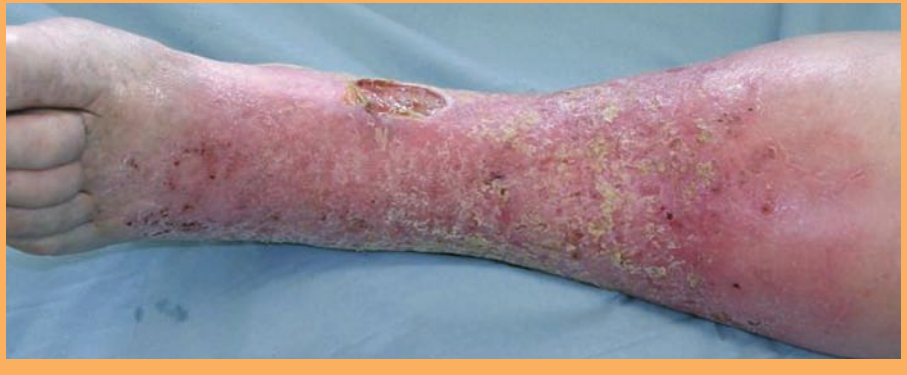

Figure 2. Chronic eczema.

Figure 3. Hyperkeratosis.

steroid ointment for a few days. The amount of topical steroid can be gradually reduced as the eczema resolves and replaced with an emollient over several days (Sibbald and Cameron, 2001). If the steroid ointment is stopped suddenly, there may be a rebound effect where the inflammatory process takes hold again. A moderately potent steroid would be appropriate for use on chronic eczema where long-term maintenance therapy is required. If the eczema fails to respond despite appropriate treatment the condition may be an allergic contact dermatitis.

Eczema around the wound can be extremely itchy and scratching the affected area could result in secondary infection. The inflammation that results is similar to allergic contact dermatitis. Severe bacterial infection of eczematous skin requires appropriate systemic antibiotics (Sibbald and Cameron, 2001). Acute varicose eczema can sometimes be confused with cellulitis due to the resulting erythematous inflammation (Quarty-Papafio, 1999).

Chronic dry eczema

Dry, scaly eczematous skin is managed with emollients to lubricate the skin and loosen the scale. An efficient and cost-effective emollient is a mixture of 50% white soft paraffin in 50% liquid paraffin (50/50), (Cameron, 1998). Patients with chronic venous insufficiency and hyperkeratosis over their lower legs should have their legs immersed in warm water for 10–20 minutes to soften the scale before applying an emollient. Treatment needs to be persistent and ongoing as the skin scale can quickly build up if left untreated.

Allergic contact dermatitis

This type of eczema results from a reaction to an external stimulus. Allergic contact dermatitis is also referred to as contact sensitivity and is particularly common in patients who have chronic venous leg ulcers (Tavadia et al, 2003; Machet et al, 2004; Saap et al, 2004). The stratum corneum is the most superficial layer of the epidermis and provides the epidermal barrier to water loss from the skin. Cutaneous changes resulting from varicose eczema or maceration impair the skin's natural barrier function. It is thought that the occlusive nature of dressings and bandages on skin where the barrier function has been disturbed in this way, might create the perfect environment for the development of allergic contact dermatitis (Wilson et al, 1991). An allergen sensitises through skin contact. Sensitised lymphocytes are reactivated on renewed contact with the allergen resulting in a reaction seen clinically as eczema. Treatment is directed at controlling any eczema present and identifying the responsible allergen. This is established by patch testing and requires referral to a dermatologist. Common leg ulcer allergens can be found in a wide range of products used in the treatment of leg ulcers, such as emollients, dressings and bandages and also in the gloves worn by the carer.

Common leg ulcer allergens

There appears to be a steady increase in allergic reactions to rubber chemicals (Gooptu and Powell, 1999). This appears to coincide with changes in nursing practice over the years, particularly the increased use of latex gloves. It is therefore advisable to wear vinyl gloves, instead of rubber latex, when treating patients with leg ulcers. It is best to avoid using topical antibiotics around leg ulcers as they may sensitise. Lanolin is not a potent sensitiser on normal skin but it remains a significant sensitiser in patients with varicose eczema and leg ulcers (Renna and Wollina, 2002; Machet et al, 2004). A high frequency of allergy to emulsifiers found in emollients such as aqueous cream, emulsifying ointment and in most creams (Cameron and Powell, 1992) has been reported among patients with chronic leg ulcers. It is therefore advisable to avoid using products that contain lanolin, creams or emulsifying ointment as a regular emollient on patients with leg ulcers. A simple emollient

Table 2

Potential sources of the main leg ulcer allergens

Type	Potential sources
Rubber	Latex gloves worn by carer and also found in some elastic bandages, supports and elastic stockings
Fragrances	Bath oils, moisturisers and baby products
Lanolin	Bath additives, emollients, barriers, baby products
Topical antibiotics	Antibiotic creams and ointments
Emulsifier	Most creams (including steroid creams and aqueous cream), emulsifying ointment and some paste bandages

Figure 4. Skin reaction to adhesive dressing.

Figure 5. Maceration.

Figure 6. Malignant ulcer.

such as 50/50 white soft paraffin should be used instead as this is less likely to sensitise. Patients can also become allergic to the topical steroids used to treat their eczema. Any patient who is not responding to treatment with a topical steroid should be referred for patch testing. Potential sources of common leg ulcer allergens are summarised in *Table 2*.

Irritant contact dermatitis

Skin reactions to adhesive dressings are not always caused by an allergy. Continual repeated application and removal of adhesive dressings may lead to an inflammatory skin reaction in some individuals (Dykes et al, 2001; Zillmer et al, 2006). Without the benefit of patch testing it is difficult to determine whether the skin reaction is an allergic or irritant reaction as the clinical appearance is often indistinguishable (*Figure 4*).

Application of povidone-iodine preparations to an open area can cause an immediate sharp stinging in some patients (Cameron, 2006). This is an irritant rather than an allergic response. Reactions to products containing povidone-iodine are mainly irritant but may occasionally be due to an allergy (Nishioka et al, 2000; Lachapelle, 2005).

It is standard good practice for a layer of orthopaedic wool padding to be applied to the leg under a compression bandage. If orthopaedic wool padding is applied directly to the skin of patients with venous ulceration it is likely to cause irritation. Compression hosiery has also been shown to cause skin irritation in some patients (Franks et al, 1995). Applying a cotton tubular layer to the leg before applying an orthopaedic wool bandage or under compression hosiery can reduce contact with the skin and help prevent an irritant reaction (Cameron and Powell, 1992).

Wound exudate

The aim of exudate management is to achieve a balance between retaining moisture at the wound bed and preventing damage to the surrounding skin. Inappropriate use of dressings, inadequate

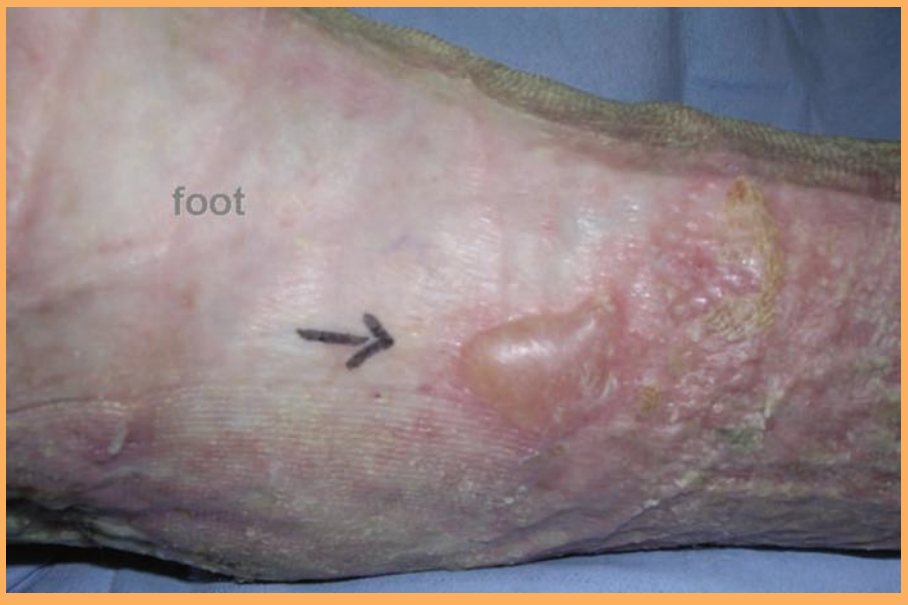

Figure 7. Blister under tight bandage.

compression, limb dependency and infection all contribute to increased exudate production. Peri-ulcer skin is particularly susceptible to damage by exudate from chronic wounds (Bishop et al, 2003). Prolonged exposure to wound exudate on the skin may result in maceration and skin breakdown (*Figure 5*). The patient may complain of a feeling of soreness and burning around the ulcer giving them much discomfort. Early intervention with an appropriate skin protectant can reduce the risk of peri-ulcer skin breakdown. Both zinc oxide paste and a barrier film that leaves a protective film on the surface of the skin have been found to be effective barrier preparations when used around venous leg ulcers (Cameron et al, 2005). The barrier film is easy to apply and does not require removal. Application of zinc paste is difficult on very moist skin and can be managed in these conditions by mixing the zinc paste with a small amount of 50/50 white soft paraffin before application. Similarly, the 50/50 mixture can aid removal by massaging some into the zinc oxide paste around the ulcer before gently wiping off with soft gauze. If the peri-ulcer skin is already damaged and appears red, inflamed, moist or weeping, then a topical steroid preparation may be required for a few days to reduce the local inflammation before the use of a skin protectant (Cameron, 2004).

Dressings

The choice of dressing and peri-ulcer skin protection play a large part in patient comfort. There is no evidence that any one dressing is more effective in healing venous leg ulcers and the choice of dressing should be appropriate for the wound conditions. When choosing an appropriate dressing it is important to understand how the dressing will handle moisture and the expected wear time. Alginate and hydrofibre dressings are suitable to use on an exuding leg ulcer. Using inappropriate dressings or having unrealistic expectations of wear time may result in delayed healing of the wound and breakdown of the surrounding skin. Adhesive dressings or those with adhesive borders are best avoided on patients with oedematous tissue or if there is any eczema present. Inappropriate use of dressings and bandages on a patient with weeping eczema may result in adhesion to the peri-wound skin, causing pain and trauma to the patient on removal. An orthopaedic wool bandage should never be applied directly to eczematous skin, as it will adhere to the eczema causing trauma and pain on removal. Open or weeping areas of eczema should be covered with a non-adherent dressing. Silicone dressings are particularly effective in preventing sticking. An emollient should be applied to any dry areas of eczema. A simple cotton tubular layer may then be applied before continuing with the first layer of the compression bandage regimen.

Malignancy

Malignancy can be missed as a cause of non-healing leg ulcers (Cameron et al, 2001). Therefore, when skin lesions fail to heal despite appropriate treatment it is important to exclude malignancy. Any patients who have areas of raised reddened tissue that bleeds easily or any crusted areas that fail to heal should be referred for further assessment (*Figure 6*).

Blisters

Blisters occur when the epidermis becomes separated from the dermis due to excessive shear forces at the epidermis/dermis interface (Cosker et al, 2005). This may sometimes occur when adhesive dressings or tapes are applied to fragile oedematous skin. Blistering may also be caused by friction from a poorly

Glossary

Acute: temporary and severe.

Allergen: substance causing an allergic reaction.

Chronic: long lasting.

Eczema: itchy inflammatory disorder of the skin.

Erythematous: reddened.

Hyperkeratosis: thick, dry, scaly skin.

Lymphocytes: specific white blood cells important in immunity and allergy.

Maceration: soggy tissue from over exposure to fluid.

Sensitiser: substance that provokes an allergic reaction on re-exposure.

applied bandage slipping or from a bandage applied too tightly and pinching the skin (*Figure 7*).

Conclusion

Care of the peri-ulcer skin plays an important part in managing a patient with a venous leg ulcer. Allergic contact dermatitis is common among patients with leg ulcers, and patients with long-standing leg ulcers and eczema should be considered for patch testing to identify if they are allergic to any of their current or past treatments. Choice of dressings should be appropriate for the wound conditions and used in conjunction with local skin care and compression therapy. Ongoing evaluation of interventions used to protect and treat the peri-ulcer skin should be undertaken. Timely and appropriate management of peri-ulcer skin can have a positive effect on ulcer healing outcomes, it can reduce nursing time and pharmacy costs and also improve the patient's quality of life. **WE**

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