

BLISTERS: IDENTIFICATION AND TREATMENT IN WOUND CARE

Blisters usually form because the outer layer of a patient's skin has become damaged. Fluid collects under the damaged layer of skin, cushioning the tissue below, protecting it from further damage and allowing it to heal. Blisters can occur for a variety of reasons and present a challenge to the healthcare professional. This article examines their aetiology and treatment.

Clare Morris is a Tissue Viability Advisor for North East Wales NHS Trust

A blister is a fluid-filled swelling occurring within or just under the skin, usually as a result of heat injury or unaccustomed friction. The fluid contained in a blister consists of serum from the blood and is usually sterile. Sometimes a blister can be filled with blood (blood blister) or pus if it has become infected.

A blister usually forms due to damage to the outer layer of the skin. Fluid collects under the damaged layer, cushioning the tissue underneath — this protects it from further damage and allows it to heal. A blood blister usually forms when a small blood vessel close to the surface of the skin ruptures, leaking blood into a tear between the layers of skin. This can happen if the skin is crushed, pinched or squeezed very tightly.

Causes

Blisters are usually caused by injury to the skin from a variety of sources, including:

- ▶▶ Heat
- ▶▶ Friction
- ▶▶ The use of certain dressings
- ▶▶ Fracture blisters — blisters that occur on swollen skin



Figure 1. A burst blister Grade 2 pressure ulcer of the heel.

- overlying a fracture
- ▶▶ Medical conditions, e.g. chicken pox, herpes, impetigo, bullous pemphigoid and pemphigus vulgaris.

Sometimes a blister can be filled with blood (blood blister) or with pus if it has become infected.

Heat blisters

There are three types of burn:

- ▶▶ Superficial burns affect the top layer of skin (epidermis) only. The skin looks red and is mildly painful and the top layer usually

- peels in a day or so after the burn. A good example is mild sunburn. Superficial burns do not usually result in blisters
- ▶▶ Partial-thickness burns cause deeper damage. The skin usually forms blisters and can be painful. In this type of burn the deeper layer of the skin (dermis) is unharmed
- ▶▶ Full-thickness burns damage all the layers of the skin. The skin is white or charred black. There may be little or no pain as the nerve endings have been destroyed. This type of burn often requires skin grafting.

The management of burn blisters is surrounded by controversy. In their literature review, Flanagan and Graham (2001) state that opinion is divided on whether blisters should be left intact or debrided. They also outline the possible beneficial and detrimental effects of burn blister fluid found in intact blisters. The benefits include faster re-epithelialisation, reduced pain and reduced bacterial infection. Detrimental effects of debriding blisters include increased risk of sepsis, eschar development, the promotion of an ideal medium for bacteria and an increased inflammatory response.

The choice of treatments include leaving the blister intact, aspiration of the fluid or, if the blister bursts spontaneously, then de-roofing the blister or aspiration of the fluid.

Friction blisters

Friction can cause the development of a grade 2 pressure ulcer; a grade 2 pressure ulcer according to the European Pressure Ulcer Advisory Panel (EPUAP) classification is partial-thickness skin loss involving epidermis, dermis or both that can appear as an abrasion or blister (*Figures 1 and 2*).

Pressure is the major cause of pressure ulcers, however, other forces such as friction and shear are also implicated in their development (Clark, 2006). Shearing force occurs when the skin remains stationary and the underlying tissues shift. Friction takes place when the skin moves across a coarse surface,



Figure 2. An intact blister Grade 2 pressure ulcer of the foot.

such as bed linen (Bergman-Evans et al, 1994).

There is also controversy about whether to aspirate or de-roof a pressure ulcer blister or to leave it intact. There are advantages to leaving the blister intact with no dressing cover as healthcare professionals can observe the pressure area and note any changes more easily than if their view is obscured by a dressing. In addition, an intact blister appears more comfortable and is less prone to infection (Read, 2001). Indeed, Ramsey (1992) states that the best dressing for a blister is its own roof. However, Read (2001) states that if a dressing is required, then a semi-permeable membrane or film dressing (e.g. OpSite (Smith & Nephew, Hull) or Tegaderm (3M, Loughborough) is appropriate as they permit observation of the area.

Preventing the development of pressure ulcers, for example grade 2 pressure ulcers, involves a combination of recognising patients who may be vulnerable through formal risk assessment, reducing or redistributing pressure, and minimising shear

and friction by, for example, employing good manual handling techniques. This information is available in more detail in the *Pressure Ulcer Management Clinical Practice Guidelines* (National Institute for Health and Clinical Excellence, [NICE], 2005).

Dressing blisters

The incidence of superficial wound problems, such as skin blistering, is a commonly reported problem, especially in orthopaedic surgery (Wright, 1994; Cosker et al, 2005). It has been suggested that the creation of shear forces at the dermal-epidermal junction, in association with decreased blood supply in the dermis, leads to postoperative blisters (Cornish, 1973). Blistering can cause increased pain, delayed healing and increased susceptibility to wound infection, as the integrity of the skin has been breached (Gupta et al, 2002).

The literature appears to demonstrate that the choice of dressing has a major impact on blistering and healing outcomes in orthopaedic patients. Dressings that employ a clear

film with a high moisture vapour transmission rate (MVTR) and an absorbent pad reduce both the rate of blistering and the amount of wound exudate. These dressings also have other advantages, such as improved patient satisfaction and the fact that they are waterproof and can be worn in the shower/bath (Jester et al, 2000; Gupta et al, 2002; Cosker et al, 2005).

Fracture blisters

Following orthopaedic trauma, the formation of fracture blisters can disrupt the patient's skin integrity, potentially delaying surgery, altering the optimum treatment plan, increasing wound infection, delaying wound healing and subsequently prolonging recovery (McCann and Gruen, 1997). The most common sites are over the tibia, ankle and elbow. There are two types: clear fluid filled and blood filled. When possible fracture blisters should be kept intact to prevent infection.

Varela et al (1993) completed a retrospective review of fracture blisters and concluded that morbidity due to postoperative infection is more probable when incisions are made directly through fracture blisters. If the surgical incision must be placed through the area of the fracture blister, the researchers concluded that the surgery should be avoided, if possible until the blisters have healed. Early surgical intervention, e.g. pin and plate, to mend the fracture before the fracture blisters occur, may help to prevent them.

Conclusion

Blisters can occur for a variety of reasons and present a variety

of challenges to the healthcare professional. However, their treatment is surrounded by controversy and it is best to seek the advice of a doctor, tissue viability specialist nurse, dermatology nurse or burns specialist nurse who will be able to offer advice related to the particular clinical situation. **WE**

Bergman-Evans B, Cudding J, Bergstrom N (1994) Clinical practice guidelines: prediction and prevention of pressure ulcers. *J Gerontol Nurs* 20(9): 19–26

Clark M (2006) *Pressure Ulcers*. Wounds UK Publishing, Aberdeen

Cornaish J (1973) Epidermal fatigue as a cause of friction blisters. *Lancet* 1: 81–3

Cosker T, Elsayed S, Gupta S, Mendonca AD, Tayton KJJ (2005) Choice of dressing has a major impact on blistering and healing outcomes in orthopaedic patients. *J Wound Care* 14(1): 27–9

European Pressure Ulcer Advisory Panel (2001) Guide to pressure ulcer grading. *EPUAP Review* 3(3): 75

Flanagan M, Graham J (2001) Should burn blisters be left intact or debrided? *J Wound Care* 10(1): 41–5

Gupta SK, Lee S, Moseley L G (2002) Postoperative wound blistering: is there a link with dressing usage? *J Wound Care* 11(7): 271–73

Jester R, Russell L, Fell S, Williams S, Prest C (2000) A one hospital study of the effects of wound dressings and other

Key Points

- ▶ A blister is a fluid-filled swelling occurring within or just under the skin.
- ▶ A blister usually forms due to damage to the outer layer of the skin.
- ▶ Blisters can be caused by injuries such as heat, friction, the use of certain dressings, fracture and some medical conditions.
- ▶ If in doubt about treatment options, seek advice from a doctor, tissue viability nurse, dermatology nurse or burns nurse.

related factors on skin blistering following total hip and knee arthroplasty. *J Orthopaed Nurs* 4: 71–7

McCann S, Gruen G (1997) Fracture blisters: a review of the literature. *Derm Nurs* 9(6): 391–97

National Institute for Health and Clinical Excellence (2005) *Pressure Ulcer Management Clinical Practise Guidelines*. NICE, London

Ramsey M (1992) Managing friction blisters of the feet. *Phys Sports Med* 20(1): 117–24

Read S (2001) Treatment of a heel blister caused by pressure and friction. *Br J Nurs* 10(1): 10–14

Wright M (1994) Hip blisters. *Nurs Times* 90(16): 86–8

Varela V, Vaughan T, Carr B, Slemmons B (1993) Fracture blisters: clinical and pathological aspects. *J Orthopaedic Trauma* 7(5): 417–27