

Using a soft silicone-coated net dressing to manage skin tears

Traditional management of skin tears can cause new damage and slow down healing. This paper discusses how to categorise these acute wounds and the significance of a study that used a soft silicone-coated net dressing on patients in a Belgian hospital

skin tears; silicone-coated net dressing; paraffin gauze; friction

Skin tears are a common problem among elderly people,¹ affecting 1.5 million people in the USA alone.^{2,3} Care of skin tears is often painful, and wound healing can be prolonged, frustrating the patient, relatives and clinician. Part of the problem is the lack of information given to the patient about wound healing.³

Since there is little information and agreement³ on skin tear management, developing a cohesive approach is essential. This article details the problems and proposes a new treatment protocol, based on a clinical trial of 88 skin tears.

Causes

Skin tears are caused by friction or combined shearing and friction forces, together with intrinsic skin changes such as decreasing strength and elasticity,⁴ and the flattening of the basement membrane zone.⁵

During ageing the layers of the skin start to atrophy, becoming parchment-like. The epidermis becomes thin and fragile, dermal thickness decreases by 20%⁶ and senile purpura are often present. This most commonly occurs on the dorsal sides of the hands and the tibia.^{3,7,8}

A number of systemic factors can impede skin-tear healing:

- Age^{2,9,10}
- Immunological status and malnutrition^{10,11}
- Oxygen intake
- Circulation.

Classification

Skin tears can be described as partial- or full-thickness wounds.¹²

Partial thickness

Friction causes a mechanical erosion of the skin, which superficially damages the epidermis.¹³

Full thickness

Friction and shearing forces damage the hypodermis and small blood vessels. In 1993 Payne et al. developed a classification system,¹² which enabled the formulation of consistent skin care guidelines:

- **Category I** This category comprises skin tears without loss of tissue, and are subdivided into linear type (Fig 1), in which the epidermis and dermis are pulled in one layer from the supporting structures, and flap type (Fig 2), where the epidermis and the dermis are separated, but the epidermal flap covers the dermis to within 1mm of the wound margin.
- **Category II** This comprises two types. The first type is wounds with a scant loss of tissue (maximum 25%) and the second type is wounds with moderate to large loss of tissue (where more than 25% of the entire flap has disappeared during the trauma) (Fig 3).
- **Category III** This type of skin tear involves the entire loss of tissue. It can be caused by the initial trauma, or necrotisation of the skin flap (Fig 4).

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Fig 1. Category I skin tear: linear type



Fig 2. Category I skin tear: flap type



Fig 3. Category II skin tear: large tissue loss (more than 25%)



Fig 4. Category III skin tear: complete tissue loss



Fig 5. Flap tends to roll up on itself

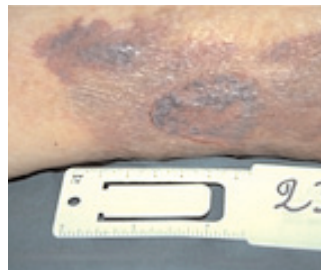


Fig 6. Flap is moved to its original position



Fig 7. New skin tear (five minutes after injury)



Fig 8. Cleansing with physiological saline

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Risk factors

Prolonged use of corticosteroids can result in skin atrophy and increased susceptibility to skin tears.¹⁴⁻¹⁶ They also slow the reaction to inflammation and the formation of collagen, delaying wound healing.¹⁵

Impaired pain perception may also increase the risk of skin tears, because patients do not feel discomfort if they injure their arms or legs, as can malnutrition, dementia,^{17,18} reduced field of vision, limited mobility and being bedridden.¹⁹

Classic treatments

Removal of the skin flap, usually in categories I and II, immediately after trauma is outdated²⁰ but still occurs. One case has been observed in my hospital and anecdotal reports have been received from a local care home. The wound has to be re-classified as category III, considerably slowing down healing.

Sutures are occasionally used to close category I and II tears,^{21,22} but they cause additional trauma because of poor circulation in the surrounding skin. Additionally, the post-wounding inflammatory reaction, with its associated erythema and oedema, can cause the fragile skin structure to tear or necrotise near the sutures.²³

Wound borders can be approximated with Steri-strips,^{8,24} although traction on the fragile epidermis combined with the inflammatory action can still cause damage. These must be carefully removed as blood crusts may tear off the epidermis.

Elsewhere, polyurethane films² or hydrocolloid dressings^{8,25} are used to secure the flap, although they have to be changed daily due to the copious amounts of exudate produced. Failure to do so increases the risk of necrotisation as the exudate prevents solid contact between the dermis and the epidermis. Moreover, removal of the polyurethane film may tear a larger part of the epidermis.²

Clinical innovation: using a soft silicone-coated dressing

Aim

Skin tears are acute wounds.^{8,9,12} Treatment aims to stop bleeding, prevent infection, recover the skin integrity,²⁶ minimise pain and promote patient comfort. The flap needs solid fixation, which is easy and non-traumatic to remove.

Category I

The damaged skin flap tends to roll up on itself after the trauma, causing the borders of the wound to widen. The removed flap must be put in its initial position^{8,9,11,13,16,26} to let the wound heal by primary intention (Figs 5 and 6). The wound is cleansed with physiological saline (0.9% NaCl).^{8,9,16,24,26} Damaged skin cells should be removed by rubbing gently on the wound bed and reverse side of the flap with gauze (Figs 7 and 8).

As these wounds dry shortly after trauma, rinsing promotes the flap's flexibility, making it possible to return it to its initial position (Fig 9) with tweezers,²⁴ although care must be taken not to damage the skin flap. Once the wound is closed, it is covered with a soft silicone-coated net dressing²⁰ such as Mepitel (Mölnlycke) (Fig 10). This adheres gently to the skin flap and the surrounding skin, but not the wound surface, thus fixating and allowing the skin flap to remain in place. It overcomes the disadvantages of paraffin gauze dressings.^{27,28}

Exudate passes through the holes in the dressing, and is absorbed by a simple absorbent secondary dressing such as Ete (Mölnlycke) or Melolin (Smith and Nephew). This is secured by a bandage that exerts a light pressure, thereby preventing further bleeding, removing exudate from under the skin flap and limiting the formation of oedema. In patients with arterial insufficiency, practitioners must not let the bandage exert too much pressure.²⁹

The secondary dressing is changed daily until day three or four, when exudate production decreases, after which the dressing can remain *in situ* until day six or seven. Fig 11 shows a flap attached to the dermis. A protective dressing such as Ete is then used for a further four or five days to protect the newly healed wound against possible new trauma.

In the past, petroleum gauze was used as a primary dressing, but it did not secure the flap properly and increased the risk of flap displacement when changing the secondary dressing, thus increasing the risk of skin necrosis.²⁶

Category II

Treatment of skin tears with limited tissue loss is practically identical to that of category I wounds. For tears with loss of more than 25% the aim is to



Fig 9. Epidermal flap in its original position



Fig 10. The soft silicone-coated dressing has been applied



Fig 11. After removal the flap is attached to the dermis

use what is remaining of the skin flap. As exudate production decreases, desiccation of the wound needs to be prevented. Placing a hydrogel dressing such as Normlgel (Mölnlycke) over the soft silicone net dressing can hydrate the wound. After six or seven days, when the skin flap has grown into the wound, the treatment continues as for category I.

Category III

If skin has been ripped off during the trauma, or if the flap has necrotised, the wound requires a moderately moist environment and is treated as an abrasion. The dressing must protect the wound against bacterial invasion and reduce pain.

The large amounts of exudate can be managed with foams,^{9,12,25} hydrofibres, alginates²⁵ or silicone gauze dressings. As the amount of exudate decreases, the wound is hydrated with hydrogel. If there are no clinical signs of infection, hydrocolloid foam dressing or a fixed gel dressing can be used until complete epithelialisation.

Deep laceration wounds

If the skin is torn until just above the fascia, check if any crucial nerves, blood vessels or sinews have been damaged. Further tearing and separation can be prevented by securing with a silicone net dressing (Figs 12–14). Most deep lacerations are closed surgically with sutures or skin grafts,³⁰ or heal by secondary intention due to the loss of substance.¹¹

Clinical research

Examination of the literature reveals a dearth of research into skin flaps.^{3,6,21} After noting positive results in case studies using new methods of treatment, we wanted to replicate this success in a retrospective clinical study in our own institution.²⁰

The trial lasted six months and involved 88 skin tears in 59 patients in eight wards. Only skin tears that fell under categories I and II (scant tissue loss only) were included in the study. This is because tears in the other categories cannot heal within eight days — when healing was evaluated — because of the rate of tissue loss.

After putting the epidermal flap in its initial position, 76% of all the wounds had little or no skin defect and could thus be classified under categories

I and II (scant tissue loss). In the rest, the skin flap had vanished totally.

About one-third of the patients were in surgical wards and the rest were in internal medicine and care-of-the-elderly wards. Two skin care nurses from each ward were appointed. We discussed the study procedure and data collection forms with them.

The following data were collected on each patient:

- Age
- Ward
- Pathology
- Medication
- Nutrition status
- Whether or not they had had skin tears before
- Prevention measures used
- Previous treatment methods
- Date and time of current injury
- Date and time the soft silicone-coated net dressing was applied
- Wound location
- Wound cause.

During the study the wound size was regularly assessed, as was the amount of bleeding and exudate, until day eight. In each case, the dressing was removed on day eight and the wound inspected to see how much it had healed.

The wound care working group held monthly meetings with the nurses from the wards to keep in touch with all cases and to ensure the progress of all the skin tears in the study was being followed.

We also correlated healing chances to risk factors, in order to draw up prevention guidelines for these wounds. For example, the literature states that cortisone can be a risk factor.¹⁴⁻¹⁶ In our study 36% of the patients were cortisone users.

A note was kept of instances where the actual practice varied from the recommended procedure.

Results

Demographic details and patient characteristics

The average age of the patients was 81 years (range: 63–93). Patient pathology fell into specific groups:

- High-risk group — those with cardiac and pulmonary problems and vascular disorders
- Dementia
- Visual and eating disorders
- Steroid therapy — 36% took cortisone.

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Fig 12. Deep laceration wound



Fig 13. Retention of the skin flap using the dressing

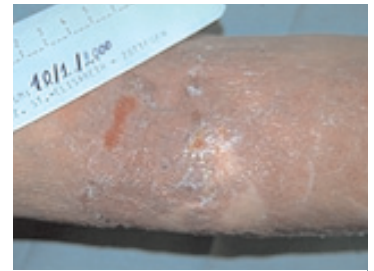


Fig 14. Day five after injury

Forty skin tears were relapses at the start of the study, whereas 29 had occurred for the first time. In the remaining cases the history was unknown.

Patients in the relapse group had had an average of five tears at the start of the study, although only 31% used precautions such as protectors, bandages and long woollen stockings. Only 30% of the patients who relapsed could offer clear statements about their previous treatments, which included:

- Ointments
- Dry treatment (exposure to air, gauze dressing)
- Wound closure strips
- Cutting away the skin flap
- Hydrocolloid dressings.

In most cases, there were no data about the heal-

ing time using the treatments listed above as the patients often gave inadequate responses.

Causes

- Bumping against hospital bed rails was responsible for one in three skin tears (32%)
- Getting in and out of bed/bed cleaning caused 23%
- Bumping against furniture (chair, seat, bedside table) and falling caused 21%
- Removing tapes/taking blood samples caused 15%
- Five percent happened to confused patients whose hands had been restrained
- Putting on/taking off stockings led to 4% (Fig 15).

Location

- 68% were on the upper extremities: 32% in the forearm; 18% on the hand; 9% on the elbow; 6% on the wrist and 3% on the upper arm
- 32% were on the lower extremities, although none were on the feet, ankles and upper legs (Fig 16).

Length

Evaluating the surface area of skin tears is not always simple, as they can be linear, triangular or oval. We therefore subdivided skin tears according to the length of their longest side:

- In 56% the longest side was ≤ 2 cm
- In 19% it was 2–3cm
- 16% were large skin tears, of which the longest side was 3–4cm
- 9% had a side exceeding 4cm.

Size did not determine the likelihood of healing.

Bleeding and skin discoloration

Half the skin tears bled moderately, 30% bled a lot and 20% did not bleed. In half of the skin tears, the trauma caused an ecchymosis (bluish discoloration) in the surrounding skin after the injury.

Time between injury and dressing application

- 68% of the skin tears were treated within half an hour of the injury
- 13% two to six hours after the injury
- 9% between six and 12 hours after the injury
- 8% between 12 and 24 hours after having received another type of treatment
- 1% treated more than 24 hours after the injury.

Box 1. The prevention policy^{3,6,9,17,25}

1. Protection of the threatened skin

- Use emollient (almond oil or commercial skin oil)
- Wear long sleeves or stockings
- Apply bandages as a precautionary measure (in the absence of arterial insufficiency)
- Wear special leg protectors
- Apply a protective film before using adhesive tapes

2. Prevention in daily care

- Apply antiphlebitis stockings carefully
- Have short fingernails or wear gloves when caring for elderly patients
- Avoid wearing jewellery during care
- Use tilt technique to prevent shearing forces
- Transport patients carefully
- Wear comfortable shoes to prevent falls
- Place, fix and remove venous catheters carefully
- When removing plasters, use glue-solvent material
- Cover the extremities with dressings, fixed with bandages
- Give special attention to getting in and out of wheelchairs
- Be aware of the risk of self-mutilation

3. A safe environment to prevent trauma

- Provide adequate lighting
- Look out for small furniture (night table, chairs) in the immediate surroundings
- Upholster sharp borders of furniture or bed surroundings with soft material

4. Education of the elderly and their environment

- Inform patient about possible precautionary measures
- Inform patient about the method of treatment
- Inform patient about the forthcoming healing process
- Extra training of health providers in prevention measures and the standard care plan

Fig 15. Causes of skin tears

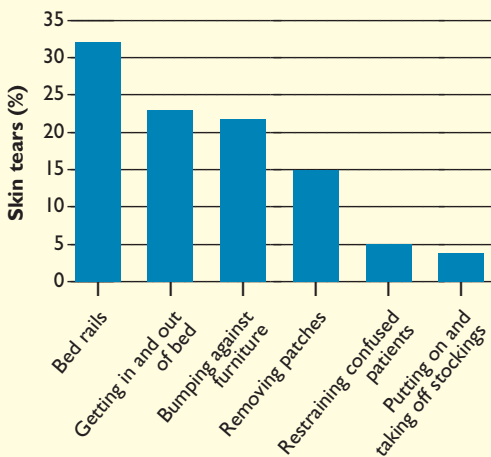
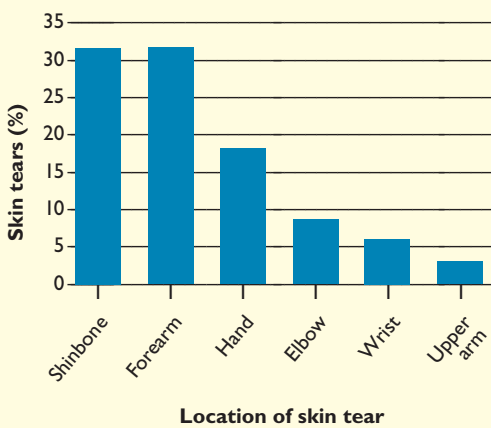


Fig 16. Location of skin tear



Healing rates

The results showed that 83% of the wounds healed by day eight (Fig 17). The remaining 17% did not heal within the suggested timescale as either bleeding or infection occurred, although the factors that caused this were not common to all. Infection occurred when there was a delay between the time of injury and dressing application: all the wounds that became infected were treated more than six hours after the trauma. During this delay there was a high risk of contamination and the epidermal flap dried up, resulting in devitalised tissue.

Prevention

We were surprised by the high incidence of skin tears and therefore drafted a prevention policy^{3,6,8,9,17,25} (Box 1).

Conclusion

Patients with cardiac, pulmonary and vascular disorders constitute a special risk group. When this pathology is combined with dementia, balance and visual problems, and steroid therapy, the risk of skin tears increases.^{15,20}

The study demonstrates that the likelihood of

Box 2. Summary of the main points

Skin tears, which are acute wounds, are common in elderly people. Additional risk factors include prolonged use of steroids, dementia, malnutrition, reduced mobility and vascular and cardiac disorders

There are three categories of skin tears. Category I is those without loss of tissue; category II minimum loss of tissue (less than 25%) or moderate to large loss (more than 25% of flap has gone); and category III entire loss of tissue

Classic treatments such as removal of the skin flap, use of sutures, and application of polyurethane film or hydrocolloid dressings can damage the wound even more before healing starts

Applying a soft silicone-coated dressing to the wound was tested in a Belgian hospital. Exudate passes through this dressing to a simple absorbent secondary dressing placed on top and fixed by a bandage. By day eight, 83% of the wounds had healed

The main causes of the skin tears were also looked at. These included bumping against hospital bed rails or other furniture, falling, removal of tapes and taking blood samples. The location of tears on the body, their size, and how soon after receiving the injury the skin tear was treated were also recorded

Arising from the research, which found a surprising number of patients with skin tears, a protocol has been drawn up for protecting the skin of vulnerable patients. The research, though small scale, has raised awareness of skin tears among nurses in the hospital where it was carried out

healing is increased when an established procedure — the use of a soft silicone-coated net dressing — is followed, and in particular when treatment is given as soon as possible after occurrence. Tears treated six or more hours post-trauma did not heal using the established procedure, and the risk of infection and necrotisation of the skin flap increased in proportion to the time between the injury and the repositioning of the skin flap. Excessive bleeding also increased the risk on non-healing.

Before carrying out treatment practitioners must inspect the skin tear thoroughly. A skin tear is often wrongly classified under category II or III. In our investigation as much as 76% of all skin tears were classified under category I, which can heal within eight days.

Last but not least, we stress the positive aspect of comfort. The silicone net dressing reduces patient discomfort during dressing changes, compared with paraffin gauze dressings.²⁹

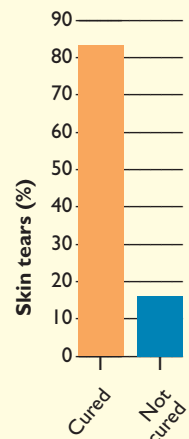
Although the investigation in our hospital was small scale, it has generated a greater consciousness of the problem of skin tears and their treatment among our nurse colleagues. ■

• This article won the Clinical Innovation/ Case Study category of the Journal of Wound Care/ Mölnlycke Best Practice Awards/Scholarship.

Next month, the winner of the original research category will be published. The article looks at patients' experiences and nurses' management of pain following toenail avulsion.

For more details, see editorial on page 362.

Fig 17. Healing figures (%)



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